

**Final
AMENDMENT TO THE
RECORD OF DECISION**

**Landfill 1 Area of Concern
former Griffiss Air Force Base
Rome, New York**


September 2009

AIR FORCE REAL PROPERTY AGENCY

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Appendix A

NYSDEC Letter of Concurrence

Appendix B

Administrative Record Index Update #1

Appendix C

Amended Proposed Plan

List of Abbreviations and Acronyms

AFB	Air Force Base
AFRPA	Air Force Real Property Agency
Air Force	United States Air Force
AOC	Area of Concern
ARAR	Applicable or Relevant and Appropriate Requirement
ATSDR	Agency for Toxic Substances and Disease Registry
BGS	below ground surface
BFSA	Bulk Fuel Storage Area
BRAC	Base Closure and Realignment Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cis-1,2-DCE	cis-1,2-dichloroethene
COC	contaminant of concern
COPC	chemical of potential concern
DCE	dichloroethylene
DFAS	Defense Finance and Accounting Services
EPA	United States Environmental Protection Agency
ESD	explanation of significant difference
ESI	expanded site investigation
FFA	Federal Facility Agreement
FS	Feasibility Study
ft/ft	feet per foot
GPR	ground-penetrating radar
HI	Hazard Index
IRP	Installation Restoration Program
µg/L	micrograms per liter
MNA	monitored natural attenuation
MTBE	methyl tert-butyl ether
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NEADS	Northeast Air Defense Sector
NPL	National Priorities List
NYANG	New York Air National Guard
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
O&M	operation and maintenance
OBGW	On-base Groundwater
ORC	oxygen releasing compound
OWS	oil/water separator
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
ppb	parts per billion

List of Abbreviations and Acronyms (cont.)

PRB	permeable reactive barrier
RAO	remedial action objective
RI	remedial investigation
ROD	Record of Decision
SAC	Strategic Air Command
SARA	Superfund Amendments and Reauthorization Act
SI	Supplemental Investigation
SPDES	State Pollutant Discharge Elimination System
SVOC	semivolatile organic compound
TBC	to-be-considered
TCE	trichloroethene
TRPH	total recoverable petroleum hydrocarbon
UST	underground storage tank
VOC	volatile organic compound
WSA	Weapons Storage Area

1.1 Statement of Basis and Purpose

This Record of Decision Amendment presents the selected modification to the remedial action for Landfill 1 Area of Concern (AOC) at the former Griffiss Air Force Base (AFB) in Rome, New York. The original remedial action was selected in the Landfill 1 Record of Decision (ROD) issued jointly by the United States Air Force (Air Force) and the United States Environmental Protection Agency (EPA) on June 5, 2000.

This modification to the original remedial action is being chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, 42 U.S.C. 9601 et. seq. This decision document explains the fundamental changes to the remedy previously selected for Landfill 1 AOC.

The New York State Department of Environmental Conservation (NYSDEC) concurs with the modification to the selected remedy (see letter in Appendix A). The information supporting this remedial action decision is contained in the administrative record for the Site. The index for the administrative record is attached to this document as Appendix B.

TABLE 1 SUMMARY OF LANDFILL 1 SELECTED REMEDY AND MODIFICATION TO THE SELECTED REMEDY	
Landfill 1 AOC – Selected Remedy (per the June 5, 2000 approved ROD)	<i>Deed restrictions on the main landfill boundary and contaminated groundwater plume; Preparation of the landfill surface and installation of an impermeable cover; Maintenance of the cover and long-term monitoring of groundwater, surface water, and sediment; Monitoring of groundwater and stream environment; Collection and treatment of groundwater/leachate from a trench at the landfill toe; and Decommissioning of monitoring wells located within the construction limits.</i>
Landfill 1 AOC – Modification to the Selected Remedy (per this ROD Amendment)	<i>Based on performance testing and sampling in 2003 and 2004, installation and operation of a groundwater/leachate collection and treatment system is not required.</i>

1.3 Description of Modification to the Selected Remedy

This modification to the Landfill 1 AOC remedy reassesses the need for a groundwater/leachate collection and treatment system at the Landfill 1 AOC. Analysis of the results of the groundwater/leachate collection trench performance test and subsequent sampling rounds conducted in 2003 and 2004 resulted in a determination that installation of a groundwater/leachate collection and treatment system is unnecessary. Therefore, this modification to the Landfill 1 AOC remedy eliminates the groundwater/leachate collection and treatment system portion of the selected remedy. In other respects, the selected remedy remains unchanged.

1.4 Explanation of Fundamental Changes

This ROD Amendment describes fundamental changes to the June 2000 ROD issued jointly by EPA and the Air Force for the Site, with concurrence from NYSDEC.

The remedy specified in the June 2000 ROD included the installation of a groundwater/leachate collection and treatment system at the Landfill 1 AOC. The system was selected because of the presence of volatile organic compounds (VOCs) and metals in the groundwater at the AOC. A groundwater/leachate collection trench performance test and four subsequent sampling rounds indicate an overall stabilization and/or decreasing trend of AOC contaminant concentrations. Groundwater well quarterly monitoring from 2003 to 2007 indicate a Site-wide stabilization of all contaminants of concern (COCs), as reported in the Long-term Monitoring Report, November 2007. Analysis of the results of the performance test and groundwater sampling resulted in a determination that the groundwater/leachate collection system is not necessary to ensure protection of public health and the environment.

Other aspects of the remedy selected in June 2000 will continue; these aspects include maintenance of the impermeable cover and long-term monitoring of the groundwater, surface water, sediment, and landfill gas.

1.5 Declaration of Statutory Determinations

The selected modified remedy meets the requirements for remedial actions set forth in CERCLA Section 121, 42 U.S.C. § 9621, because it: 1) is protective of human health and the environment; 2) meets a level or standard of control of the hazardous

substances, pollutants and contaminants, which at least attains the legally applicable or relevant and appropriate requirements under federal and state laws; 3) is cost-effective; and 4) utilizes permanent solutions to the maximum extent practicable.

1.6 ROD Data Certification Checklist

The ROD (as amended by this ROD Amendment) contains the remedy selection information noted below. More details may be found in the original ROD and the Administrative Record for this Site. As the original remedy satisfied the requirements listed in the Data Certification Checklist, only information pertaining to the modification of the remedy as part of this Amendment are detailed below.

- Chemicals of concern and their respective concentrations – Not affected by the Amendment;
- Baseline risk represented by the chemicals of concern – Not affected by the Amendment;
- Cleanup levels established for chemicals of concern and the basis for these levels – Not affected by the Amendment;
- How source materials constituting principal threats are addressed – Not affected by the Amendment;
- Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of groundwater used in the baseline risk assessment and ROD – Not affected by the Amendment;
- Potential land and groundwater use that will be available at the site as a result of the selected remedy – Not affected by the Amendment;
- Estimated capital, annual operation and maintenance (O&M), and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected – Provided in Section 3.2.7;
- Key factor(s) that led to selecting the remedy (i.e., describe how this Amended Remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision) – Provided in Section 3.2 with additional rationale for issuing the Amendment in Section 2.6;

balancing and modifying criteria, highlighting criteria key to the decision –
Provided in Section 3.2 with additional rationale for issuing the Amendment
in Section 2.6;

1.7 Authorizing Signatures

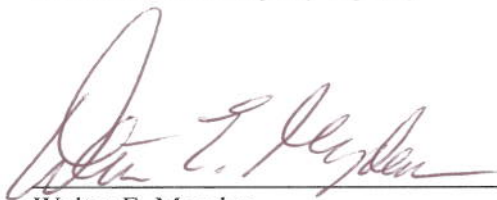
This Amendment to the remedy meets the requirements for remedial action set forth in CERCLA, Section 121. NYSDEC has concurred with this Amendment to the remedial action presented in this ROD.



Robert M. Moore
Director
Air Force Real Property Agency

18 SEP 09

Date



Walter E. Mugdan
Director, Emergency and Remedial Response Division
United States Environmental Protection Agency, Region 2

9/25/09

Date

2.1 Former Griffiss AFB History and Enforcement Activities

2.1.1 Operational History

The mission of the former Griffiss AFB varied over the years. The base was activated on February 1, 1942, as Rome Air Depot, with the mission of storage, maintenance, and shipment of material for the U.S. Army Air Corps. Upon creation of the Air Force in 1947, the depot was renamed Griffiss AFB. The base became an electronics center in 1950, with the transfer of Watson Laboratory Complex (later Rome Air Development Center [1951], Rome Laboratory, and then the Air Force Research Laboratory Information Directorate, established with the mission of accomplishing applied research, development, and testing of electronic air-ground systems). The 49th Fighter Interceptor Squadron was also added. The Headquarters of the Ground Electronics Engineering Installations Agency was added in June 1958 to engineer and install ground communications equipment throughout the world. On July 1, 1970, the 416th Bombardment Wing of the Strategic Air Command (SAC) was activated with the mission of maintenance and implementation of both effective air refueling operations and long-range bombardment capability. Griffiss AFB was designated for realignment under the Base Realignment and Closure Act in 1993 and 1995, resulting in deactivation of the 416th Bombardment Wing in September 1995. The Air Force Research Laboratory Information Directorate and the Northeast Air Defense Sector (NEADS) will continue to operate at their current locations; the New York Air National Guard (NYANG) operated the runway for the 10th Mountain Division deployments until October 1998, when they were relocated to Fort Drum; and the Defense Finance and Accounting Services (DFAS) established their present operating location at the former Griffiss AFB.

2.1.2 Environmental Background

As a result of the various national defense missions carried out at the former Griffiss AFB since 1942, hazardous and toxic substances were used and hazardous wastes were generated, stored, or disposed of at various locations on the installation. The

defense missions involved, among others, procurement, storage, maintenance, and shipping of war materiel; research and development; and aircraft operations and maintenance.

Studies and investigations under the U.S. Department of Defense Installation Restoration Program have been carried out to locate, assess, and quantify the past toxic and hazardous substance storage, disposal, and spill sites. These investigations included a records search in 1981 (Engineering Sciences 1981), interviews with base personnel, a field inspection, compilation of an inventory of wastes, evaluation of disposal practices, and an assessment to determine the nature and extent of site contamination; Problem Confirmation and Quantification studies (similar to what is now designated a Site Investigation) in 1982 and 1985; soil and groundwater analyses in 1986; a basewide health assessment in 1988 by the U.S. Public Health Service, Agency for Toxic Substances and Disease Registry (ATSDR); base-specific hydrology investigations in 1989 and 1990; a groundwater investigation in 1991; and site-specific investigations between 1989 and 1993. The ATSDR issued a Public Health Assessment for Griffiss AFB, dated October 23, 1995, and an addendum, dated September 9, 1996.

Pursuant to Section 105 of CERCLA, Griffiss AFB was included on the National Priorities List on July 15, 1987. On August 21, 1990, the Air Force, EPA, and NYSDEC entered into an FFA under Section 120 of CERCLA.

The Air Force provided a number of reports to NYSDEC and EPA for review and comment. These reports address remedial and related activities that the Air Force is required to undertake under CERCLA and include identification of AOCs on base; a scope of work for a Remedial Investigation (RI); a work plan for the RI, including a sampling and analysis plan and a quality assurance project plan; a baseline risk assessment; a community relations plan; multiple RI reports; work plans and the reports for supplemental investigations (SIs); and a Landfill Cover Investigation Report. The Air Force delivered the draft-final RI report covering 31 Areas of Concern (AOCs) to the EPA and NYSDEC on December 20, 1996. The final SI Report was delivered on July 24, 1998.

2.1.2 Landfill 1 Area of Concern Background

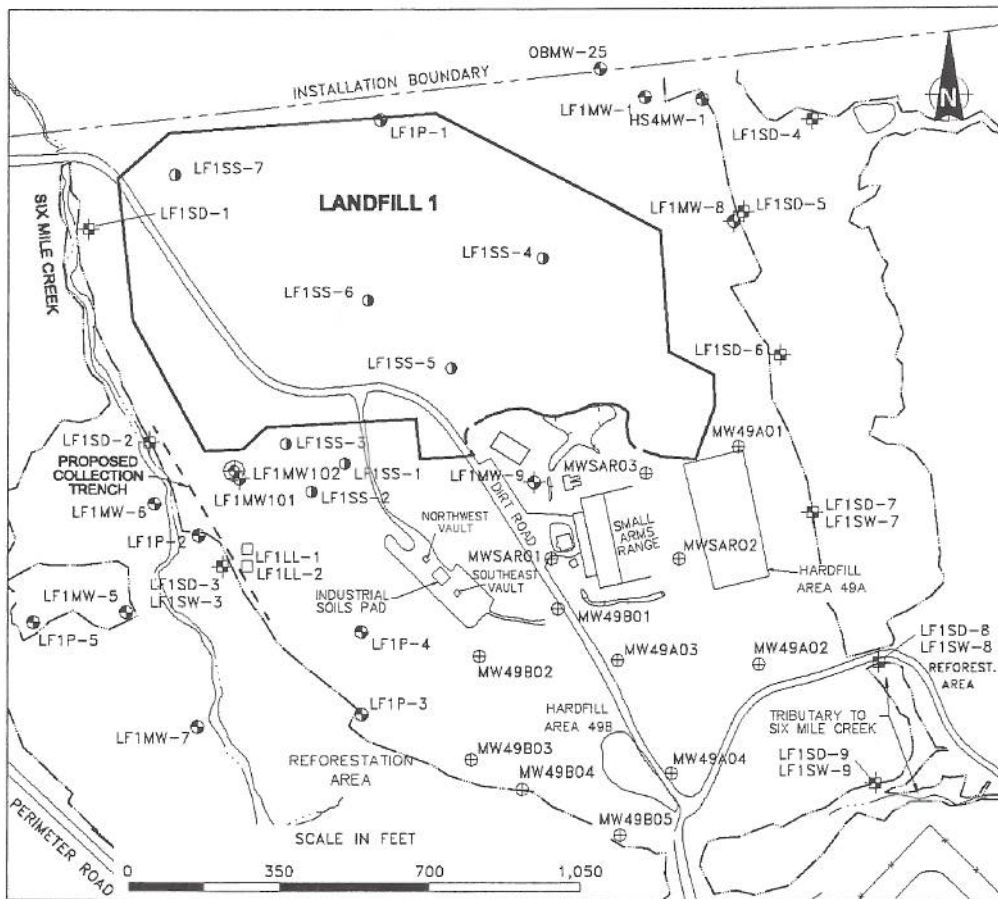
Landfill 1 is an approximately 22-acre area located in the north-central portion of the former Griffiss AFB (see Figure 1). It was operated primarily as a trench-and-cover

landfill from 1960 to 1973. Early cells were constructed in an east-west orientation and were from 40 to 50 feet wide and 300 to 500 feet long. Wastes were disposed in the landfill to depths of 15 to 18 feet.

According to historical records, wastes received by the landfill included fire debris in the western portion, steam plant ash in the eastern portion, unlabeled 55-gallon drums, partially filled cans of an unknown crystalline chemical, and miscellaneous debris containing metallic and sheetrock components. The bottom and sides of the landfill are unlined, but three surface portions are capped with 1 to 4 feet of natural soils and clay. The landfill is bounded by the installation boundary on the north side, regulated wetlands and a tributary of Six Mile Creek on the east side, Six Mile Creek and regulated wetlands on the west side, and woodlands on the south side.

Initial Site investigations were performed in 1981 and 1982. Visually identified wastes at the Site included unlabeled 55-gallon drums, decomposed cardboard drums, and several open burning areas with partially filled cans of an unknown crystalline chemical (the cans and some of the drums were later removed at an unknown date). Rust-tinted seeps were observed at the base of the slope heading toward wetlands adjacent to Six Mile Creek, and iron, zinc, and toluene were identified in the samples. Three portions of the landfill (approximately 6 acres) were originally capped in the 1970s; in 1984, the same portions were regraded with locally available soils and clay.

As part of this preliminary investigation, nine groundwater monitoring wells were installed at Landfill 1 and were sampled in 1982. A tenth well was installed in January 1990. In May 1991, samples collected from five of the wells indicated the presence of VOCs that exceeded current state standards for groundwater. In 1992 and 1993, the Air Force conducted a baseline investigation of the chemical contamination of Site groundwater. As part of the investigation, all ten wells at Landfill 1 were sampled on a



LEGEND

- x — FENCE
- JURISDICTIONAL WETLANDS BOUNDARY
- - - - - INSTALLATION BOUNDARY
- EXTENT OF LANDFILL AREA TO BE CAPPED
- - - - - PROPOSED COLLECTION TRENCH LOCATION
ROD Amendment removes requirement for Trench
- ⊕ RI MONITORING WELL DECOMMISSIONED DURING THE SUPPLEMENTAL INVESTIGATION
- ⊙ EXISTING WELL
- ⊕ HARDFILL/SMALL ARMS RANGE MONITORING WELL
- ⊕ RI MONITORING WELL
- ⊕ RI SURFACE WATER AND/OR SEDIMENT SAMPLE
- RI LEACHATE SAMPLE
- ⊙ RI SURFACE SOIL SAMPLE

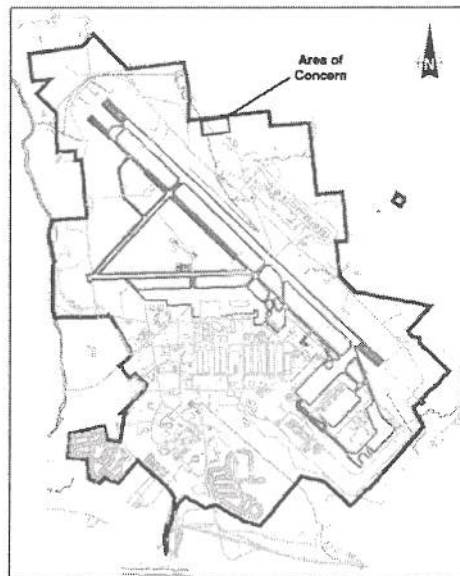


Figure 1 – Location of Landfill 1 AOC on former Griffiss Air Force Base and Site Map for Landfill 1 AOC

quarterly basis for one year. NYSDEC groundwater standards for several VOCs, manganese, zinc, lead, cadmium, and glycols were exceeded.

In 1994, a remedial investigation (RI) was performed. The groundwater studies indicated the presence of VOCs, metals, and a pesticide exceeding NYSDEC groundwater standards and guidance values. Groundwater also was observed seeping as leachate from the southwestern end of the landfill. The leachate samples contained VOCs, pesticides, and metals that exceeded groundwater standards. The RI soil samples indicated the presence of semivolatile organic compounds (SVOCs) and metals exceeding New York State soil cleanup objectives. The surface water samples in Six Mile Creek exceeded NYSDEC Class C surface water standards and federal ambient water quality criteria for several SVOCs, pesticides, polychlorinated biphenyls (PCBs), and metals.

In April 1999, a Long-term Monitoring Baseline Study was conducted. This study generally concluded that VOC concentrations in groundwater were stabilizing or decreasing as compared to the results recorded during the 1994 RI.

In June 2000, the ROD was issued. The selected remedial action was developed in accordance with EPA Presumptive Remedy Guidance for Military Landfills, dated April 29, 1996, for the expeditious cleanup of sites that are similar in character to a large number of CERCLA sites that have already been remediated. In the spring of 2003, in accordance with the ROD, remedial activities began at Landfill 1. The remedial activities consisted of the regrading and capping of Landfill 1 with an impermeable cover, the installation of a groundwater/leachate collection trench along the western edge of Landfill 1 (See Figure 2), and the decommissioning of monitoring wells located within the construction limits.

In November 2003, a performance test was conducted on the seven pump stations located along the groundwater/leachate collection trench to evaluate the necessity of a groundwater/leachate collection and treatment system. Upon review of the analytical results and subsequent sampling rounds, the design of the treatment system was suspended.

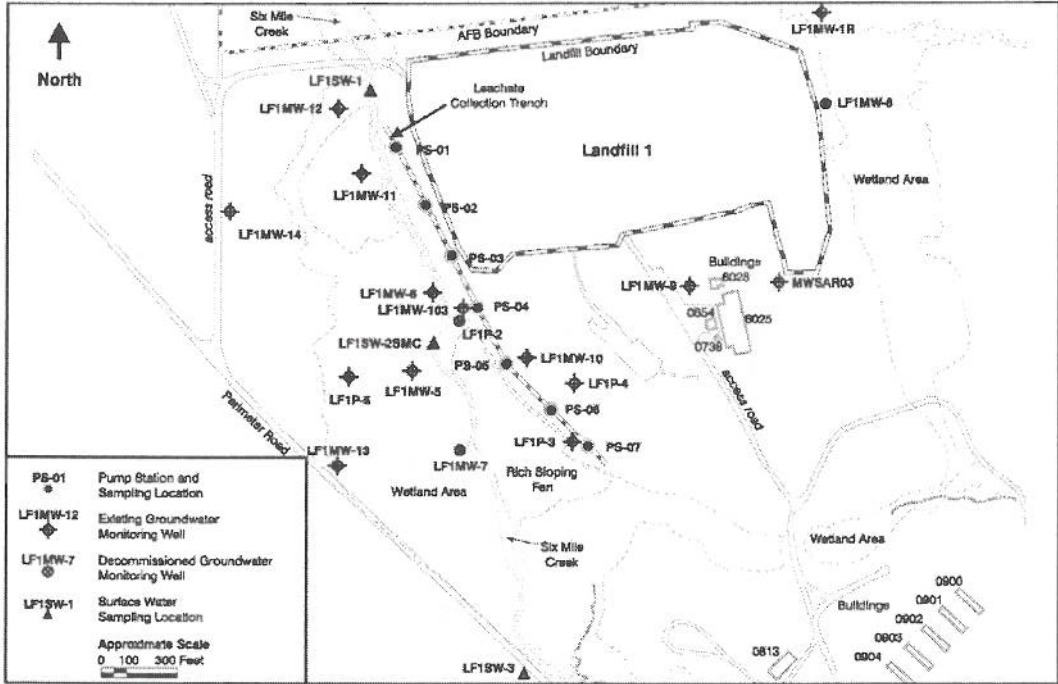


Figure 2 – Leachate Collection Trench and Groundwater Sampling Locations

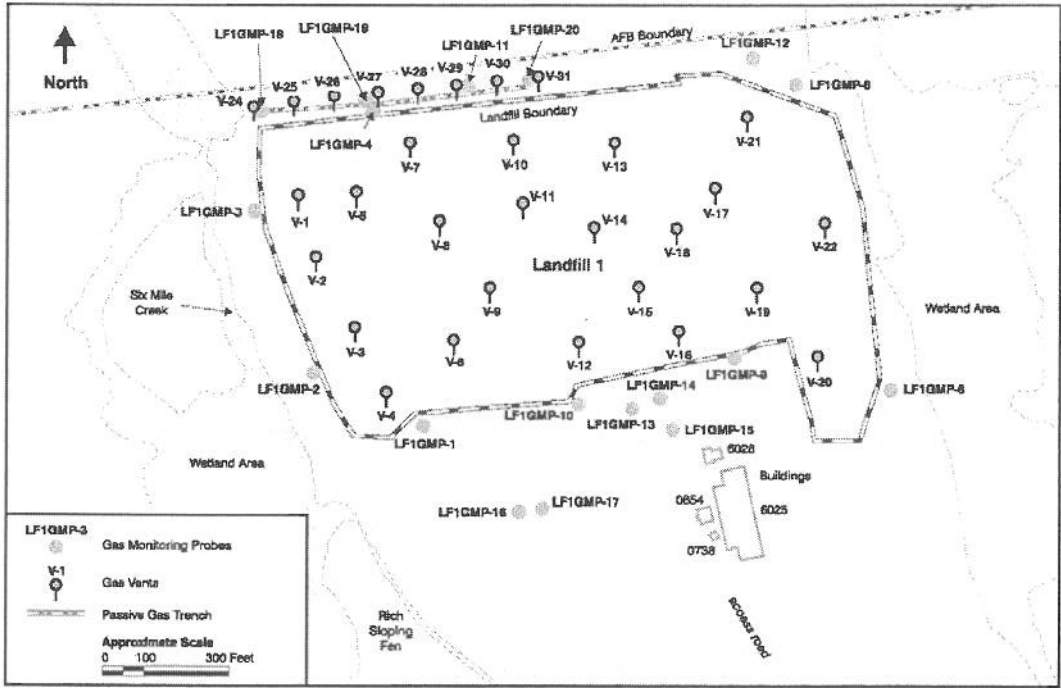


Figure 3 – Gas Collection Trench and Network

In June 2006, the Landfill 1 Gas Summary Report identified several areas of concern related to landfill gas. Subsequently the long term monitoring health and safety plan was modified, procedures were implemented to address potential hazards, and a passive gas trench was installed to prevent the landfill gas from migrating beyond the northern property line (See Figure 3).

2.2 Highlights of Community Participation

The revised proposed plan for Landfill 1 AOC was released to the public on September 25, 2008. The revised proposed plan and other Site-related documents are available for review in the administrative record file located at 153 Brooks Road in the Griffiss Business and Technology Park and on the administrative record Web site found at <https://afarpaar.lackland.af.mil/ar/docsearch.aspx>. This ROD Amendment will be included to supplement the administrative record file for the ROD. An index for the supplement to the administrative record is attached to this document as Appendix B.

A notice was published in the Daily Sentinel on September 24, 2008 to announce the public comment period on the revised proposed plan, the date of the public meeting, and the availability of the technical documents at the repository.

The public comment period began on September 25, 2008, and ended on October 25, 2008. A public meeting was held on October 8, 2008, at the MVE Conference Room, Air Force Real Property Agency, 153 Brooks Road, Griffiss Business and Technology Park, Rome, New York. The purpose of the public meeting was to discuss the proposed amendment to the June 5, 2000 ROD. More information on this process is provided in Section 4.

2.3 Current and Potential Future Site and Resource Uses

Griffiss AFB was designated for realignment under the Defense Base Closure and Realignment Act (BRAC) in 1993 and 1995, resulting in deactivation of the 416th Bombardment Wing in September 1995. Currently, the Landfill 1 AOC land use is open space (non-residential), and deed restrictions are in place to restrict the use of groundwater at this AOC. The anticipated future use at the Landfill 1 AOC is to remain

the same, open space (non-residential). As a municipal water supply is available near the site, future use of site groundwater is not anticipated and thus will limit human exposure.

2.4 Summary of Site Risks

Site risks were analyzed based on the extent of contamination at the Landfill 1 AOC in making the remedy selection in 2000. As part of the RI, a baseline risk assessment was conducted to evaluate current and future potential risks to human health and the environment associated with contaminants found in the soils, sediments, surface water, and groundwater at the AOC. The results of the assessment were considered in the cleanup goal selection process as provided in the original ROD. No updates or adjustments were made or required as a result of development of this amendment to the ROD. The human health and ecological risk assessments performed using the RI data are still appropriate, though conservative, since concentration of the COCs have been decreasing since the RI samples were collected.

2.5 Remedial Action Objectives

The following are the remedial action objectives of the June 5, 2000 ROD that were developed for this AOC based upon the use of presumptive remedy guidance and the site data:

- Consolidation of various debris and waste areas into the main landfill boundary in order to reduce the area to be capped and the potential for nearby wildlife and human populations to be exposed to the landfill mass;
- Significantly reduce infiltration of rain water and snow-melt water through the landfill mass in order to minimize the potential for leachate generation and groundwater contamination;
- Collection and treatment of groundwater/leachate in order to reduce or eliminate the discharge of contamination to the environment; and
- Monitoring groundwater and stream environment (which may include but is not necessarily limited to, sediment, surface water, and biota) downgradient of the AOC to evaluate the effectiveness of the presumptive remedy.

The following Remedial Action Objectives now apply based on the modification to the remedy as provided in this ROD Amendment:

- Completed: Consolidation of various debris and waste areas into the main landfill boundary in order to reduce the area to be capped and the potential for nearby wildlife and human populations to be exposed to the landfill mass;
- Completed: Significantly reduce infiltration of rain water and snow-melt water through the landfill mass in order to minimize the potential for leachate generation and groundwater contamination; and
- Ongoing: Monitoring groundwater and stream environment (which may include, but is not necessarily limited to, sediment, surface water, and biota) downgradient of the site to evaluate the effectiveness of the presumptive remedy.

2.6 Rationale for Issuing the ROD Amendment

Site conditions have stabilized since the issuance of the 2000 ROD. Performance testing conducted during and subsequent to construction of the remedial alternative resulted in a determination that certain remedial components would no longer be required. Technical details of these assessments are provided in the amended Proposed Plan (See Appendix C) and are summarized in this ROD Amendment.

The 2003 pump station performance test indicated that at all pump station sample locations:

- The levels of inorganic contamination were indicative of background levels found throughout the base.
- PCB results were nondetect.
- VOCs were below groundwater standards or marginally exceeded groundwater standards, with the exception of one pump station.
- SVOCs were below groundwater standards or marginally exceeded groundwater standards.

The results from four quarterly sampling rounds substantiated the findings of the pump station performance test. The evaluation of data resulted in development of the following conclusions:

- Concentrations of metals reported at the seven pump stations had remained at background levels found throughout the base. Iron and manganese consistently exceeded groundwater standards with concentrations above the iron standard (0.3 mg/L) ranging from 0.327 mg/L to 25.5 mg/L and concentrations above the manganese standard (0.3 mg/L) ranging from 0.611 mg/L to 11.2 mg/L.
- PCBs and pesticides were not detected at any sampling location during any sampling round.
- Several VOCs were reported at concentrations above state standards; however, the VOC exceedances reported between the April 2004 and December 2004 sampling rounds were at concentrations within one order of magnitude of the state standard and at similar levels to those reported in the November 2003 pump station performance test.
- SVOCs had remained at concentrations below groundwater standards with one exception. The concentration of 1,4-dichlorobenzene consistently exceeded the standard of 3 µg/L with concentrations above the standard ranging from 6 µg/L to 8 µg/L at four pump stations.
- The observed concentrations indicated an overall stable and/or decreasing trend.
- In addition, the results of the groundwater well quarterly sampling rounds indicated a Site-wide stabilization of all contaminants of concern, including VOCs and metals at Landfill 1, as reported in the Long-term Monitoring Report, November 2007. There were no VOC exceedances of the NYSDEC Class A Surface Water Standards at the three surface water sampling locations during the 12 sampling rounds from December 2003 to April 2007.

Based on these conclusions, it was determined that the incorporation of leachate collection and treatment is not required and that an amendment to the selected remedy is thus appropriate.

Additionally, conclusions provided in the Landfill Gas Summary Report resulted in construction of a passive gas trench at the northern property line. Monitoring of the landfill gas as part of the operation and maintenance of the passive gas trench is provided as part of the original remedy and is retained for the amended remedy.

3.1 Description of Remedial Alternatives

CERCLA regulations mandate that a remedial action must be protective of human health and the environment, cost effective, and utilize permanent solutions and treatment technologies to the maximum extent practicable. These regulations also establish a preference for remedial actions that employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of contaminants at a site. As part of the presumptive remedy approach, a “no action” scenario as dictated by CERCLA was compared to the presumptive remedy alternative.

Under the No Action Alternative, no remedy would be implemented at the Landfill 1 AOC. Landfill 1, however, was shown to pose an unacceptable potential threat to human health under residential and agricultural future-use scenarios. The No Action alternative was therefore rejected because of its inability to meet the threshold requirements of an appropriate alternative.

As documented in this ROD Amendment, the Presumptive Remedy Alternative no longer contains the requirement for operation of a leachate collection and treatment system. The amended remedy includes all other aspects of the remedy as selected in the June 2000 ROD.

3.2 Summary of Comparative Analysis of Alternatives

During the detailed evaluation of remedial alternatives, each alternative is assessed against nine evaluation criteria set forth in the National Contingency Plan. The No Action alternative was rejected; therefore, the analysis below addresses the Presumptive Remedy Alternative, as amended.

3.2.1 Protection of Human Health and the Environment

Based on the results of the pump station performance test, groundwater monitoring, and surface water monitoring, concentrations of COCs have stabilized and in most cases are decreasing at the Landfill 1 AOC. The implementation of the other

portions of the selected remedy (institutional controls, installation of the impermeable cover, and continued monitoring of the groundwater, surface water, sediment, and landfill gas) is anticipated to prevent future exposures. This amendment does not impact protection of human health and the environment.

3.2.2 Compliance With ARARs

The decreasing concentrations of contaminants will continue to be monitored to ensure that chemical-specific ARARs for groundwater are met in the future. The action-specific ARAR provided in the June 5, 2000 ROD and associated with the carbon adsorption treatment system is no longer included as the amended remedy does not include carbon adsorption treatment.

3.2.3 Long-Term Effectiveness and Permanence

Institutional controls, landfill capping, and long-term monitoring do not represent a completely permanent solution to contamination at the AOC, as the presumed sources of groundwater contamination would likely remain within the landfill. However, since landfill excavation was not considered because of the large size of the landfill, and because specific sources of contamination were not identified, this remedy represents a reasonable long-term approach for this AOC. Long-Term Effectiveness and Permanence is not impacted by changes to the remedy resulting from this ROD Amendment.

3.2.4 Reduction in Toxicity, Mobility or Volume Through Treatment

Since no specific sources of contamination were identified and the concentrations of COCs have stabilized or are decreasing, treatment of the groundwater/leachate is deemed unnecessary. The amended remedy no longer contains a component for treatment.

3.2.5 Short-term Effectiveness

The original remedy discussed the possibility of disruptions to wetlands habitat as a result of installation and operation of the trench. As the amended remedy no longer considers collection and treatment of leachate, the potential issues for impact on short-term effectiveness are no longer valid. All other components remain unchanged.

3.2.6 Implementability

The technologies proposed for capping the landfill and performing monitoring are proven and reliable. Changes made to the remedy as part of this amendment do not negatively impact implementability. In fact, the amended remedy has a lower degree of complexity as the system for collection and treatment of leachate is no longer required. Therefore, the amended remedy is more easily implemented.

3.2.7 Cost

Costs for the amended remedy include groundwater, surface water, landfill gas and wetland monitoring; landfill cap and land-use control maintenance; vector control; inspections; and reporting. Current annual long-term monitoring costs range from \$75,000 to \$100,000 with a reduction to approximately \$50,000 as the remedy progresses. The costs for annual activities are higher than were presented in the June 5, 2000 ROD, but reflect actual costs. The collection and treatment component was never operational, and removal of this component of the remedy represents a cost reduction as well as a reduction in waste generation and general carbon footprint (treatment of collected leachate requires the use of activated carbon which must be acquired, delivered to the site, utilized, and then either permanently disposed of or regenerated; the treatment process would have also involved the use of pumps which require electricity).

3.2.8 State Acceptance

The State of New York concurs on the amendment to the remedy. A letter of concurrence is attached as Appendix A.

3.2.9 Community Acceptance

No objections from the community were raised regarding the proposed amendment to the remedy. A responsiveness summary, pertaining to the amended remedy, is attached as Appendix C. However, no substantive comments were received at the October 8, 2008, public meeting. No written comments were received. Appendix C includes the amended Proposed Plan.

3.3 Selected Remedy/Concurrence

EPA, with concurrence from NYSDEC, has determined that the previously selected remedy (ROD approved June 5, 2000) as modified by this ROD Amendment is appropriate for the Landfill 1 AOC.

3.4 Statutory Determinations

The Air Force and EPA, with concurrence from NYSDEC, have determined that remedial action as amended is warranted for the Landfill 1 AOC. The selected remedy, as amended, continues to be protective of human health and the environment, complies with federal and NYS ARARs, is cost effective, and utilizes permanent solutions to the extent possible. Although this remedy, as amended, does not use treatment as a principal element of the remedy, it accomplishes the required end result of protection of human health and the environment.

Five-year reviews will be performed by the Air Force, in conjunction with the EPA and NYSDEC, to ensure that the selected remedy is still performing as planned and remains protective of public health and the environment.

3.5 Documentation of Significant Changes

No significant changes have been made to the selected amended remedy from the time the amended Proposed Plan was released for public comment.

On September 25, 2008, AFRPA, following consultation with and concurrence of EPA and NYSDEC, released for public comment a proposed plan for amending the remedial action at the Landfill 1AOC located at the former Griffiss AFB. The release of the proposed plan initiated the public comment period, which concluded on October 25, 2008.

During the public comment period, a public meeting was held on Wednesday, October 8, 2008, at 5:00 p.m. at the Mohawk Valley EDGE (MVE) Conference Room, Air Force Real Property Agency, 153 Brooks Road, Griffiss Business and Technology Park, Rome, New York. The proposed amended remedy for the Landfill 1AOC site was presented at the public meeting and a court reporter recorded the proceedings of the meeting. Copies of the transcript and attendance list are included in the Administrative Record. The public comment period and the public meeting were intended to elicit public comment on the amended proposed plan for the Landfill 1 AOC.

No substantive comments were received during the meeting. No written comments were received during the public comment period.

Appendix A

NYSDEC Letter of Concurrence

New York State Department of Environmental Conservation

Division of Environmental Remediation, 12th Floor

625 Broadway, Albany, New York 12233-7011

Phone: (518) 402-9706 • FAX: (518) 402-9020

Website: www.dec.state.ny.us



Alexander B. Grannis
Commissioner

AUG 13 2008

Kathryn Halvorson
Director
Air Force Real Property Agency
1700 North Moore Street
Suite 2300
Arlington, VA 22209

RE: Former Griffiss Air Force Base, Site #633006
June 2008 Revised Record of Decision Amendment

Dear Ms. Halvorson:

The New York State Department of Environmental Conservation and the New York State Department of Health have reviewed the June 2008 Revised Record of Decision Amendment document for the Landfill 1 Area of Concern at the Former Griffiss Air Force Base. The State concurs with the change to the remedy selected in the original Record of Decision (February 2000). We understand that the change to the remedy will involve elimination of the requirement for the leachate collection and treatment system.

If you have any questions please contact Mr. John Swartwout at (518) 402-9620.

Sincerely,

Dale A. Desnoyers
Director
Division of Environmental Remediation

cc: G. Pavlou, USEPA
J. Malleck, USEPA
D. Pocze, USEPA
M. McDermott, AFRPA
C. Jerrard, AFRPA
M. Rabe, AFRPA

Appendix B
Administrative Record Index Update #1
For the ROD Amendment

Conti Environmental, Inc., Landfill 1 Cover Improvements, Engineer's Certification Report Addendum, September 2006.

Conti Environmental, Inc., Landfill 1 Post-Closure Operations and Maintenance Manual Addendum, May 2006.

Conti Environmental, Inc., Landfill Gas Summary Report, March 2006.

Conti Environmental, Inc., Landfill 1 Cover Improvements, Engineer's Certification Report, February 2005.

Conti Environmental, Inc. Landfill 1 Cover Improvements, Pump Station Performance Test Analytical Results, Former Griffiss Air Force Base, February 2004.

Conti Environmental, Inc. and EA Engineering, Landfill 1 Cover Improvements Closure Plan, October 2002.

FPM Group, Ltd., Final Evaluation Report, Landfill 1 Groundwater/Leachate Collection Trench, Revision 1.0, January 2007.

FPM Group, Ltd., Long Term Monitoring Report, Landfills Areas of Concern, Revision 0.0, August 2005.

FPM Group, Ltd., Draft LTM Monitoring Report, Landfills Areas of Concern Revision 1.0, November 2004.

Appendix C
Amended Proposed Plan

Revised Proposed Plan

LANDFILL 1 AOC



Former Griffiss Air Force Base Rome, New York

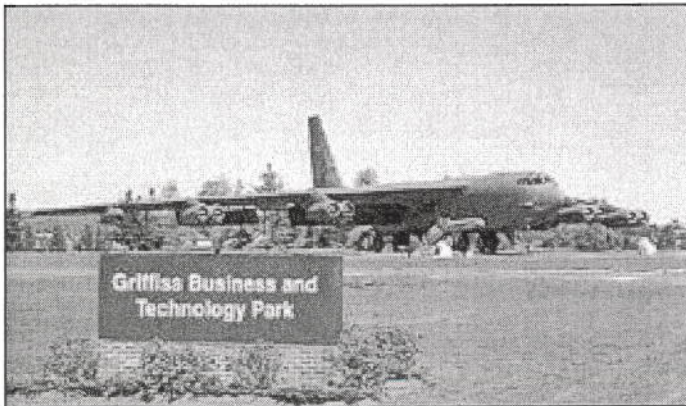
Public Comment Period

September 25 to October 25, 2008

September 2008

Air Force Recommends a Change to the Remedy in the Landfill 1 AOC Record of Decision

Public Comments Solicited



Former Griffiss Air Force Base is located in Rome, New York.

This revised *proposed plan* is issued by the United States Air Force (Air Force) following consultation with the United States Environmental Protection Agency (EPA) and the New York State Department of Environmental Conservation (NYSDEC). In this document, the Air Force, EPA, and NYSDEC will be referred to as “the agencies.” The document has been prepared in accordance with public participation requirements of the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980, the National Contingency Plan*, and the former Griffiss Air Force Base (AFB) *Federal Facility Agreement*.

The preferred remedial action stated in this revised proposed plan was developed in accordance with EPA Presumptive Remedy Guidance for Military Landfills, dated April 29, 1996, for the expeditious cleanup of sites that are similar in character to a large number of CERCLA sites that have already been remediated. Presumptive remedies are preferred technologies for common categories of sites based on historical patterns of remedy selection and EPA’s scientific and engineering evaluations of performance data on technology implementation.

This plan is intended to elicit public comments on a change to the remedy selected in the original *Record of Decision* (June 5, 2000). Due to the results of the groundwater/leachate collection trench performance test and subsequent sampling rounds, which indicated overall stable and/or decreasing trends of Site contaminants (see page 11), it was determined that installation of a groundwater/leachate collection and treatment system was unnecessary. Therefore, this plan proposes the removal of the groundwater/leachate collection and treatment system from the remedial action objectives and the Presumptive Remedy Alternative. An amendment to the ROD will be made only after the public comment period has ended and responses and information submitted during this time period have been reviewed and considered. Please refer to the Community Participation section at the end of this document for information on submitting public comments.

This Fact Sheet describes:

- The environmental investigations that have been conducted at Landfill 1.
- The revised proposed plan to take remedial action at Landfill 1.
- How you can participate in the final decision process for Landfill 1.

Revised Proposed Plan

a document supporting a request for amendment to the remedy in the original proposed plan. Requires public review and comment.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

commonly known as Superfund; a federal law that establishes a program to identify, evaluate, and remediate sites where hazardous substances may have been released, leaked, poured, spilled, or dumped into the environment.

National Oil and Hazardous Substances Pollution Contingency Plan (NCP)

the federal regulation that provides the organizational structure and procedures for responding to releases of hazardous substances, pollutants, and contaminants.

Federal Facility Agreement (FFA)

an agreement between the EPA, the State of New York, and the U.S. Air Force to evaluate waste disposal sites at the former Griffiss AFB and perform remediation if necessary.

Record of Decision (ROD)

a public document that identifies the selected action at a site, outlines the process used to reach a decision on the remedy, and confirms that the decision complies with CERCLA. An amendment to the ROD identifies the changes in the selected remedy and the information used to support the changes.

Note: Highlighted yellow text indicates a revision to the original July 1999 proposed plan.

SITE DESCRIPTION

Regional

The former Griffiss AFB covered approximately 3,552 contiguous acres in the lowlands of the Mohawk River Valley in Rome, Oneida County, New York. Topography within the valley is relatively flat, with elevations on the former Griffiss AFB ranging from 435 to 595 feet above mean sea level. Threemile Creek, Six Mile Creek (both of which drain into the New York State Barge Canal, located to the south of the base), and several state-designated wetlands are located on the former

Groundwater Recharge Zone

an area where the underlying aquifer (water-bearing zone) receives water (recharge) through downward flow of both precipitation which infiltrates into the ground and other surface water bodies such as streams, lakes, etc.

Base Realignment and Closure Act (BRAC)

a federal law that established a commission to determine which military bases would be closed and which would remain active.

Agency for Toxic Substances and Disease Registry (ATSDR)

the federal agency responsible for performing health assessments for facilities on the National Priority List.

Griffiss AFB, which is bordered by the Mohawk River on the west. Due to its high average precipitation and predominantly silty sands, the former Griffiss AFB is considered a *groundwater recharge zone*.

Griffiss AFB Operational History

The mission of the former Griffiss AFB varied over the years. The base was activated on February 1, 1942, as Rome Air Depot, with the mission of storage, maintenance, and shipment of material for the U.S. Army Air Corps. Upon creation of the U.S. Air Force in 1947, the depot was

renamed Griffiss Air Force Base. The base became an electronics center in 1950, with the transfer of Watson Laboratory Complex (later Rome Laboratory). The 49th Fighter Interceptor Squadron was also added in that year. In June 1951, the Rome Air Development Center was established with the mission of accomplishing applied research, development, and testing of electronic air-ground systems. The Headquarters of the Ground Electronics Engineering Installations Agency was added in June 1958 to engineer and install ground communications equipment throughout the world. On July 1, 1970, the 416th Bombardment Wing of the Strategic Air Command (SAC) was activated with the mission of maintenance and implementation of both effective air refueling operations and long-range bombardment capability. Griffiss AFB was

designated for realignment under the *Base Realignment and Closure Act* in 1993 and 1995, resulting in deactivation of the 416th Bombardment Wing in September 1995. Rome Laboratory and the Northeast Air Defense Sector (NEADS) will continue to operate at their current locations; the New York Air National Guard (NYANG) operated the runway for the 10th Mountain Division deployments until October 1998 when they were relocated to Fort Drum; and the Defense Finance and Accounting Services (DFAS) has established an operating location at the former Griffiss AFB.

Environmental Background

As a result of the various national defense missions carried out at the former Griffiss AFB since 1942, hazardous and toxic substances were used and hazardous wastes were generated, stored, or disposed at various sites on the installation. The defense missions involved, among others, procurement, storage, maintenance, and shipping of war materiel; research and development; and aircraft operations and maintenance.

Numerous studies and investigations under the U.S. Department of Defense Installation Restoration Program have been carried out to locate, assess, and quantify the past toxic and hazardous waste storage, disposal, and spill sites. These investigations included a records search in 1981, interviews with base personnel, a field inspection, compilation of an inventory of wastes, evaluation of disposal practices, and an assessment to determine the nature and extent of Site contamination; Problem Confirmation and Quantification studies (similar to what is now designated a Site Investigation) in 1982 and 1985; soil and groundwater analyses in 1986; a base-wide health assessment in 1988 by the U.S. Public Health Service, *Agency for Toxic Substances and Disease Registry*; base-specific hydrology investigations in 1989 and 1990; a groundwater investigation in 1991; and Site-specific investigations between 1989 and 1993. ATSDR issued a Public Health Assessment for Griffiss AFB, dated October 23, 1995, and an addendum, dated September 9, 1996.

Pursuant to Section 105 of CERCLA, Griffiss AFB was included on the *National Priorities List* on July 15, 1987. On August 21, 1990, the agencies entered into a Federal Facility Agreement under Section 120 of CERCLA.

Under the terms of the agreement, the Air Force was required to prepare and submit numerous reports to NYSDEC and EPA for review and comment. These reports address remedial activities that the Air Force is required to undertake under CERCLA and include identification of *Areas of Concern* on base; a scope of work for a *Remedial Investigation*; a work plan for the RI, including a sampling and analysis plan and a quality assurance project plan; a baseline risk assessment; a community relations plan; an RI report; a work plan and the report for a supplemental investigation; and a Landfill Cover Investigation Report. The Air Force delivered the draft-final RI report covering 31 AOCs to EPA and NYSDEC on December 20, 1996. The Final Landfill Cover Investigation Report was delivered on December 8, 1997, and the final Supplemental Investigation report was delivered on July 24, 1998. The original Final Proposed Plan and ROD were issued in July 1999 and February 2000, respectively. A Long-term Monitoring Baseline Study Report was delivered in March 2000 and the Landfill 1 Cover Improvements Report was issued in February 2004. A Landfill 1 Cover Improvements Engineer's Certification Report was issued in February 2005, and the Final Evaluation

Report for the Landfill 1 Groundwater/Leachate Collection Trench was issued in January 2007.

This revised proposed plan for remedial action is based on an evaluation of potential threats to human health and the environment due to contamination in the soil, sediment, surface water, and groundwater media at the Landfill 1 AOC and adjacent areas. During the RI, a Site-specific *baseline risk assessment* (using appropriate toxicological and exposure assumptions to evaluate cancer risks and non-cancer health hazards) was conducted in order to evaluate the risks posed by detected Site contaminants to the reasonably maximally exposed individual under current and future land use assumptions. In the RI report, the results of the risk assessment were compared to available standards and guidance values using federal and state environmental and public health laws that were identified as potentially *applicable or relevant and appropriate requirements* at the Site. Chemical-specific ARARs are usually health- or risk-based numerical values or methodologies that result in a numerical value when applied to site-specific conditions. Currently, there are no chemical-specific ARARs for soil (other than for PCBs), sediments, or air. Therefore, other non-promulgated federal and state advisories and guidance values, referred to as *To-Be-Considereds*, and *background levels* of the contaminants in the absence of TBCs, were considered. This comparison was used in the selection of the preferred remedial action.

National Priorities List (NPL)

a formal listing established by CERCLA of the nation's worst hazardous waste sites that have been identified for possible remediation. Sites are ranked by the EPA based on their potential for affecting human health and the environment.

Area of Concern (AOC)

a location where hazardous substances are or may have been placed or may be located.

Remedial Investigation (RI)

an environmental investigation that identifies the nature and extent of contamination at a site. Also provides an assessment of the potential risks associated with a site.

Baseline Risk Assessment

an assessment required by CERCLA to evaluate potential risks to human health and the environment. This assessment estimates risks/hazards associated with existing and/or potential human and environmental exposures to contaminants at an area.

Applicable or Relevant and Appropriate Requirements (ARARs)

"applicable" requirements mean those standards, criteria, or limitations promulgated under federal or state law that are required specific to a substance, pollutant, contaminant, action, location, or other circumstance at a CERCLA site. For example, the New York State groundwater standards. "Relevant and appropriate" requirements mean those standards, requirements, or limitations that address problems or situations sufficiently similar to those encountered at the CERCLA sites so that their use is well suited to that particular site.

To-Be-Considereds (TBCs)

advisories, criteria, or guidance that do not meet the definition of ARAR, but may be useful in developing remedial action alternatives. For example, the New York State groundwater guidance values.

Background Levels

the level of a chemical or contaminant naturally occurring in the vicinity of the site.

LANDFILL 1 AREA OF CONCERN

Landfill 1 is an approximately 22-acre area located in the north-central portion of the former Griffiss AFB (see Figures 1 and 2). It was operated primarily as a trench-and-cover landfill from 1960 to 1973. Early cells were constructed in an east-west orientation and were from 40 to 50 feet wide and 300 to 500 feet long. Wastes were disposed in the landfill to depths of 15 to 18 feet.

According to historical records, wastes received by the landfill included fire debris in the western portion, steam plant ash in the eastern portion, unlabeled 55-gallon drums, partially filled cans of an unknown crystalline chemical, and miscellaneous debris containing metallic and sheetrock components. The bottom and sides of the landfill are unlined but three surface portions are capped with 1 to 4 feet of natural soils and clay. The landfill is bounded by the installation boundary on the north side, regulated wetlands and a tributary of Six Mile Creek on the east side, Six Mile Creek and regulated wetlands on the west side, and woodlands on the south side. The central portion of Landfill 1 consisted of planted trees; the northeastern area of the landfill is vegetated with grasses; and the remaining areas are planted with red pine, white spruce, scotch pine, American cedar, larch, black walnut, and evergreens. Two areas of the Landfill 1 AOC are considered significant natural communities by the New York State Natural Heritage Program. These areas consist of: (1) a white-cedar-dominated rich sloping fen wetland adjacent to the wetlands on the east side; and (2) an undisturbed hemlock hardwood swamp located in a mature forest adjacent to the northeast corner of the Site.

The Landfill 1 AOC is located in an area of variable topography, with 45 feet of relief occurring primarily in the western portion of the Site, adjacent to Six Mile Creek. Most of the landfill drains southeast toward a tributary of Six

Mile Creek; the western portion drains to the west toward the Six Mile Creek flood plain and adjacent wetland area.

Landfill 1 rests at the toe of a sloping plane of low permeability bedrock. Information obtained from groundwater monitoring wells at the Site indicates that the water table slopes 2% to the southwest toward Six Mile Creek. Leachate seeps emerging from several points along the base of the slope leading to the wetlands adjacent to Six Mile Creek have been observed at Landfill 1 since 1982.

The uppermost soils, from ground surface to 2.5 feet below ground surface (BGS), consist of clayey sand to silty fine sand. Deeper soils consist predominantly of fine to medium, variably silty and gravelly sand.

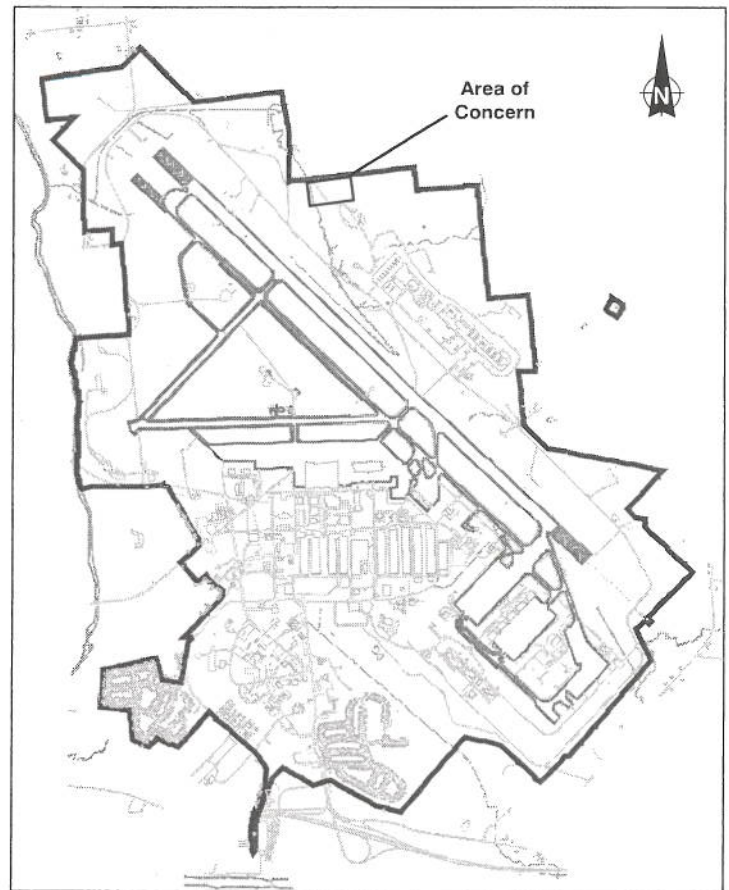
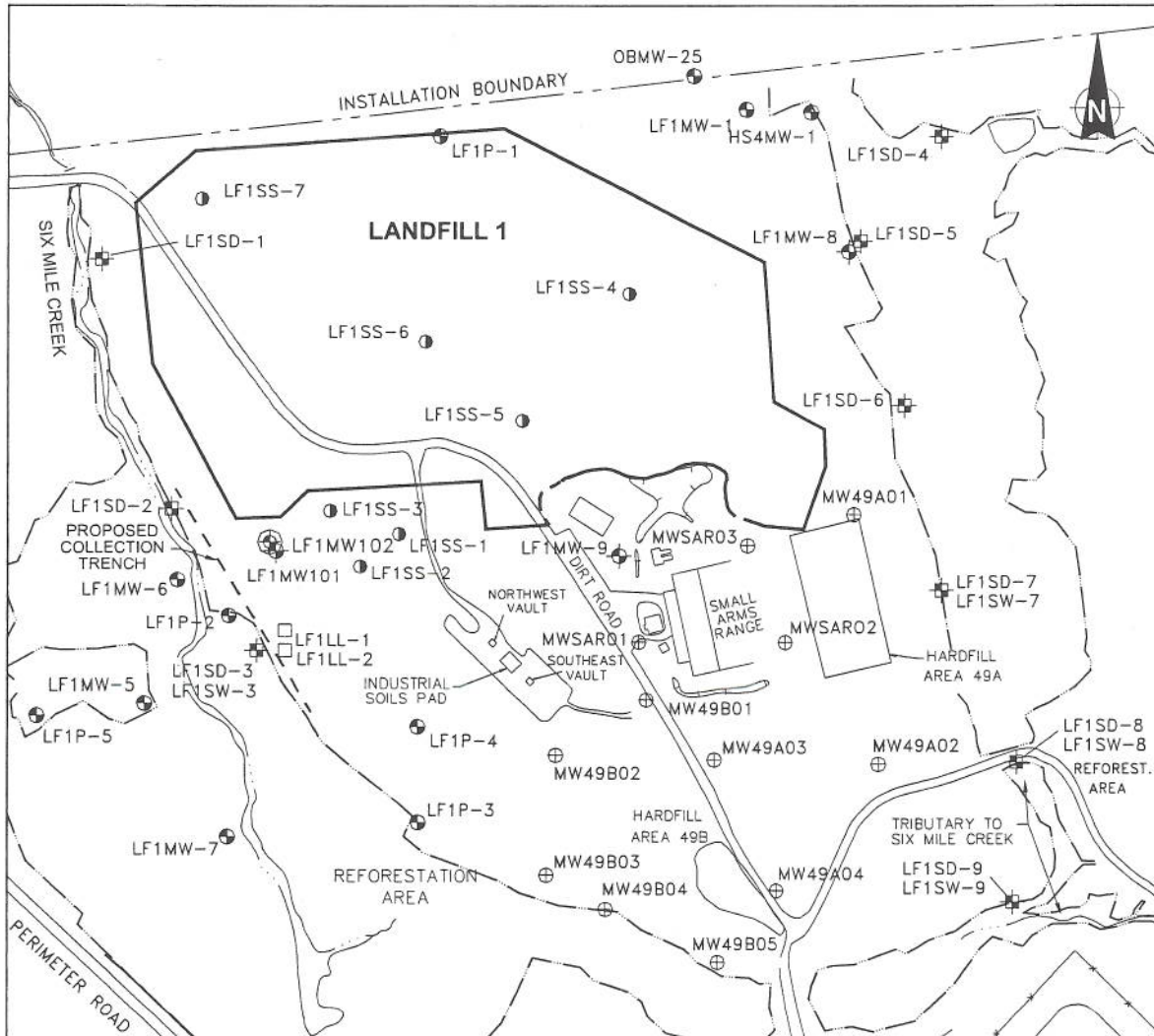


Figure 1: Landfill 1 AOC is located in the northern portion of the former Griffiss AFB.



LEGEND

- | | | | |
|-----------|--------------------------------------|---|---|
| — x — | FENCE | ⊕ | RI MONITORING WELL DECOMMISSIONED DURING THE SUPPLEMENTAL INVESTIGATION |
| — — — — — | JURISDICTIONAL WETLANDS BOUNDARY | ⊙ | EXISTING WELL |
| - - - - - | INSTALLATION BOUNDARY | ⊕ | HARDFILL/SMALL ARMS RANGE MONITORING WELL |
| — — — — — | EXTENT OF LANDFILL AREA TO BE CAPPED | ⊕ | RI MONITORING WELL |
| - - - - - | PROPOSED COLLECTION TRENCH LOCATION | ⊕ | RI SURFACE WATER AND/OR SEDIMENT SAMPLE |
| | | □ | RI LEACHATE SAMPLE |
| | | ⊙ | RI SURFACE SOIL SAMPLE |

SCALE IN FEET



Figure 2: Landfill 1 AOC Site Map (RI Report, 1996)

SUMMARY OF SITE ACTIVITIES

Initial Investigations

Initial Site investigations were performed in 1981 and 1982. Visually identified wastes at the Site included unlabeled 55-gallon drums, decomposed cardboard drums, and several open burning areas with partially filled cans of an unknown crystalline chemical (the cans and some of the drums were later removed at an unknown date). Rust-tinted seeps were observed at the base of the slope heading toward wetlands adjacent to Six Mile Creek, and iron, zinc, and toluene have been identified in the samples. Three portions of the landfill (approximately 6 acres) were originally capped in the 1970s; in 1984, the same portions were regraded with locally available soils and clay.

As part of this preliminary investigation, nine groundwater monitoring wells were installed at Landfill 1 and were sampled in January and February of 1982. A tenth well was installed in January 1990. In May 1991, samples collected from five of

Volatile Organic Compounds (VOCs)
a group of organic compounds that have a tendency to vaporize readily.

Semivolatile Organic Compounds (SVOCs)
a group of organic compounds that are easily extracted from soil, water, etc.

the wells indicated the presence of four organic compounds that exceeded the current state standards for groundwater. In 1992 and 1993, the Air Force conducted a baseline investigation of the chemical contamination of Site groundwater. As part of the investigation, all ten wells at Landfill 1 were sampled on a quarterly basis for one year. NYSDEC groundwater standards for several *volatile organic compounds*, manganese, zinc, lead, cadmium, and glycols were exceeded.

Remedial Investigations

In 1994, an RI was performed. The main objective of the RI was to investigate the nature and extent of environmental contamination from historical releases at the AOC in order to determine whether any remedial action was necessary to prevent potential threats to human health and the environment. The RI included a geophysical survey consisting of a magnetometry survey and ground-penetrating radar (GPR) survey; a passive soil gas survey; sampling and analysis of surface soil, surface water,

sediment, leachate and fish tissue analysis (collected during the Six Mile Creek Remedial Investigation); the installation of four additional groundwater monitoring wells; and the collection and analysis of groundwater samples from up to 13 monitoring wells (two wells were not sampled due to high turbidity and potential grout contamination, and another well was resampled and analyzed for specific chemicals).

The results of the geophysical survey indicated several anomalies representing eight disposal trenches and discrete disposal locations. Of these anomalies, GPR profiles indicated that two strong subsurface reflections were buried metallic objects. The passive soil gas survey indicated the presence of chlorinated solvents and petroleum fuel constituents.

Several species of fish were collected and analyzed for hazardous constituents as part of the Six Mile Creek AOC. Pesticides/PCBs were among the chemicals of potential concern detected in the composite whole-body fish tissue samples taken from the brown trout, creek chub and white sucker. The detected concentrations of pesticides/PCBs ranged from 0.165 mg/kg (for the creek chub taken upstream of the Site) to 13.5 mg/kg (creek chub taken approximately 4000 feet downstream of the Site). The presence of pesticides/PCBs found in the whole-body fish tissue samples (which were similar to the contaminants found in the leachate samples from Landfill 1) was considered in the selection of the preferred remedial action.

Seven surface soil samples collected during the RI were analyzed for chemicals potentially present in Landfill 1. One VOC, 13 *semivolatile organic compounds*, seven pesticides, and 21 metals were detected. The concentrations of three SVOCs and five metals exceeded the most stringent criterion (see Table 1).

Analysis of groundwater samples indicated the presence of 23 VOCs, nine SVOCs, 11 pesticides, and 23 metals. The concentrations of eight VOCs, one pesticide, and 12 metals exceeded the most stringent criterion (see Table 2).

**Table 1
COMPOUNDS EXCEEDING STANDARDS OR GUIDANCE VALUES
LANDFILL 1 AOC
RI SURFACE SOIL SAMPLES (1994)**

Compound	Range of Detected Concentrations	Frequency of Detection Above Most Stringent Criterion	Most Stringent Criterion
SVOCs ($\mu\text{g}/\text{kg}$)			
Benzo(a)anthracene	110 J - 270 J	1/7	224 ^a
Benzo(a)anthracene	16 J - 240 J	5/7	61 ^a
Dibenzo(a,h)anthracene	55 J - 75 J	2/7	14 ^a
Metals (mg/kg)			
Chromium, hexavalent	0.26 - 2.1	5/7	0.45 ^b
Chromium, total	6.4 J - 25.2	1/7	22.6 ^b
Copper	27.1 - 443 J	7/7	43 ^b
Molybdenum	5.8 - 15 J	3/7	ND ^b
Thallium	0.48 - 0.94	1/7	0.9 ^b

^a NYS-recommended soil cleanup objective.

^b Background screening concentration.

Key:

J = Estimated concentration.

ND = Nondetect.

**Table 2
COMPOUNDS EXCEEDING STANDARDS OR GUIDANCE VALUES
LANDFILL 1 AOC
RI GROUNDWATER SAMPLES (1994)**

Compound	Range of Detected Concentrations	Frequency of Detection Above Most Stringent Criterion	Most Stringent Criterion
VOCs ($\mu\text{g}/\text{L}$)			
1,4-Dichlorobenzene	0.044 J - 7.2	1/13	4.7 ^a
Benzene	0.16 J - 6	4/13	0.7 ^a
Chlorobenzene	0.34 J - 11	1/13	5 ^a
Ethylbenzene	0.49 J - 12	1/13	5 ^a
Isopropylbenzene	0.19 J - 12	2/13	5 ^a
1,2,4-Trimethylbenzene	1.8 - 100	4/13	5 ^a
1,3,5-Trimethylbenzene	1.1 - 92	4/13	5 ^a
Xylenes, total	1.8 - 110	3/13	5 ^a
Pesticides/PCBs ($\mu\text{g}/\text{L}$)			
Dieldrin	0.001 J - 0.002 J	2/12	ND ^a
Metals (mg/L)			
Aluminum	0.097 - 141	5/12	0.05 ^b
Antimony	0.00106 J - 34.9	1/12	0.003 ^c
Barium	0.023 - 49	1/12	1 ^a
Beryllium	0.29	1/12	0.003 ^c
Cadmium	0.097 - 7.6	2/12	0.01 ^a
Chromium, total	0.13 - 18.6	2/12	0.05 ^a
Copper	0.01 - 5.8	2/12	0.2 ^a
Iron	0.17 - 219	11/12	0.3 ^a
Manganese	0.16 - 13.7	12/12	0.05 ^b
Nickel	0.07 - 0.23	1/12	0.1 ^d
Sodium	3.6 - 51.1	5/12	20 ^a
Zinc	0.011 - 32.9	2/12	0.3

^a NYSDEC Class GA groundwater standard.

^b Federal secondary maximum contaminant level.

^c NYSDEC Class GA groundwater guidance value.

^d Federal maximum contaminant level.

Key:

J = Estimated concentration.

ND = Nondetect.

Note: The calculated 95% upper confidence limit (UCL) levels are presented in the RI report.

SUMMARY OF SITE ACTIVITIES (Cont.)

Groundwater has also been observed seeping as leachate from the southwestern end of the landfill. The leachate samples collected during the RI contained 18 VOCs, 10 SVOCs, 25 pesticides, and 14 metals. The compounds that exceeded groundwater effluent standards and Class GA groundwater standards are identified in Table 3.

Analysis of surface water samples indicated the presence of two VOCs, 13 SVOCs, 11 pesticides/PCBs, and nine metals. The concentrations of six

PCBs

(polychlorinated biphenyls) a group of synthetic organic chemicals with varying harmful effects. Humans come in contact with PCBs by breathing air, ingesting soil or water, and through dermal contact with soil or water containing PCBs.

SVOCs, two pesticides, five PCBs, and three metals exceeded the most stringent criterion (see Table 4).

Analysis of the sediment samples collected for

the RI indicated the presence of eight VOCs, 20 SVOCs, 21 pesticides/PCBs, and 23 metals. The concentrations of two VOCs, 13 SVOCs, 14 pesticides/PCBs, and seven metals exceeded the most stringent criterion (see Table 5).

An RI supplemental investigation was performed in 1997 for Landfill 1 to investigate two significant subsurface geophysical anomalies detected during the RI and to analyze the surrounding soils and contents of a partially buried drum located in Landfill 1 just north of the Small Arms Range (SAR). No drums were found in the test pits, and scrap steel appeared to be the cause of the significant geophysical anomalies. Because no drums were found, no

samples were collected at these pits. The partially buried drum mentioned above was labeled "Lube Oil, Sinclair REF-1" and contained a black, very viscous, grease-like material. The drum contents were sampled for toxicity characteristic leaching procedure (TCLP) VOCs and SVOCs, PCBs, and Resource Conservation and Recovery Act (RCRA) characteristics to determine methods of disposal. The partially buried drum and surrounding stained soils were excavated and disposed of at a permitted facility in January 1998. Verification soil sampling for VOCs, SVOCs, pesticides/PCBs and metals following the drum and stained soil removal indicated no residual contamination from the drum.

A Landfill Cover Investigation performed in 1997 included the following tasks: historical records search, field survey, aerial photographic survey, auger investigation, permeability sample collection, and a hydrologic evaluation of landfill performance model analysis. The investigation further defined the areal extent of the landfill and the landfill boundary and revealed that the thickness of the existing landfill soil cover ranges from one to four feet. In addition, several exposed empty drums were observed that were later excavated and removed. Visual inspection and verification sampling using a photoionization detector following excavation of soil surrounding the drums indicated no residual contamination.

**Table 3
COMPOUNDS EXCEEDING STANDARDS OR GUIDANCE VALUES
LANDFILL 1 AOC
RI LEACHATE SAMPLES (1994)**

Compound	Range of Detected Concentrations	Frequency of Detection Above Most Stringent Criterion	Most Stringent Criterion
VOCs (µg/L)			
1,2,4 Trimethylbenzene	4.9 - 320	1/3	5 ^{ab}
1,3,5 Trimethylbenzene	2.1 - 250	1/3	5 ^{ab}
1,4 Dichlorobenzene	0.06 J - 20	2/3	3 ^{ab}
Benzene	1.3	1/3	1 ^{ab}
Chlorobenzene	5 J - 9.4 J	2/3	5 ^{ab}
Ethylbenzene	0.45 J - 110	1/3	5 ^{ab}
Xylenes, Total	2.1 - 600	1/2	5 ^{ab}
Pesticides/PCBs (µg/L)			
Aldrin	0.007 J - 0.015 J	2/4	ND ^{ab}
Endrin	0.001 J	1/4	ND ^{ab}
gamma BHC (lindane)	0.007 J	1/4	ND ^b
Aroclor 1242	1	1/3	0.09 ^{ab}
Silvex (2,4,5-TP)	0.26 J - 5.6 J	2/5	0.26 ^{ab}
p,p'-DDE	0.009 J	1/4	ND ^b
p,p'-DDT	0.005 J	1/4	ND ^b
Metals (mg/L)			
Iron	9.82 - 26.5	3/3	0.3 ^b
Manganese	0.248 - 0.85	2/3	0.3 ^b

^a NYSDEC groundwater effluent standard (6 NYCRR 703.6).

^b NYSDEC Class GA groundwater standard (6 NYCRR 703.5)

Key:

J = Estimated concentration.

ND = Nondetect

**Table 4
COMPOUNDS EXCEEDING STANDARDS OR GUIDANCE VALUES
LANDFILL 1 AOC
RI SURFACE WATER SAMPLES (1994)**

Compound	Range of Detected Concentrations	Frequency of Detection Above Most Stringent Criterion	Most Stringent Criterion
SVOCs (µg/L)			
Anthracene	0.0029 J - 0.031 J	2/3	0.003 ^a
Benzo(a)anthracene	0.014 J - 0.031 J	2/3	0.003 ^a
Chrysene	0.014 J - 0.032 J	3/3	0.003 ^a
Fluorene	1.1 J	1/3	0.003 ^a
Phenanthrene	0.091 J	1/3	0.003 ^a
Pyrene	0.054 J	1/3	0.003 ^a
Pesticides/PCBs (µg/L)			
Dieldrin	0.001 J	1/5	0.000071 ^a
Hexachlorobenzene	0.001 J - 0.002 J	3/5	0.00072 ^a
2,2,3,4,6-Pentachlorobiphenyl	0.046 J	1/3	0.000001 ^b
2,2,4,4,5,6-Hexachlorobiphenyl	0.013 J - 0.036 J	3/3	0.000001 ^b
2,2,4,4-Tetrachlorobiphenyl	0.034 J - 0.058 J	2/3	0.000001 ^b
2,3-Dichlorobiphenyl	1 J	1/3	0.000001 ^b
2,4,5-Trichlorobiphenyl	0.038 J	1/3	0.000001 ^b
Metals (mg/L)			
Iron	0.21 - 0.68	2/3	0.3 ^b
Lead	0.002	1/3	0.001 ^a
Manganese	0.006 - 0.084	1/3	0.05 ^a

^a Federal ambient water quality criterion for protection of human health. Reference: Quality Criteria for Water, EPA 440/5-86-001 (May 1, 1986).

^b NYSDEC Class C surface water standard.

Key:

J = Estimated concentration.

**Table 5
COMPOUNDS EXCEEDING STANDARDS OR GUIDANCE VALUES
LANDFILL 1 AOC
SEDIMENT SAMPLES**

Compound	Range of Detected Concentrations	Frequency of Detection Above Most Stringent Criterion	Most Stringent Criterion
VOCs ($\mu\text{g/L}$)			
Benzene	4 J - 6 J	2/19	0.6 ^a
Chlorobenzene	16 J	2/19	3.5 ^{*b}
SVOCs ($\mu\text{g/kg}$)			
3-Methylphenol	240 J	1/19	0.5 ^b
3-Methylphenol (P-cresol)	240 J	1/19	0.5 ^b
Acenaphthylene	62 J - 69 J	2/19	44 ^c
Benzo(a)anthracene	110 J - 660	3/19	1.3 ^{*a}
Benzo(a)pyrene	130 J - 500 J	5/19	1.3 ^{*a}
Benzo(b)fluoranthene	40 J - 1100	7/19	1.3 ^{*a}
Benzo(k)fluoranthene	30 J - 550 J	5/19	1.3 ^{*a}
Bis(2-ethylhexyl)phthalate	22 J - 9400 J	8/19	199.5 ^{*b}
Chrysene	210 J - 800	3/19	1.3 ^{*a}
Fluoranthene	15 J - 1300	2/19	600 ^{*c}
Indeno(1,2,3-cd)pyrene	72 J - 240 J	3/19	1.3 ^{*a}
Phenanthrene	12 J - 320 J	4/19	120 ^{*b}
Pyrene	72 J - 1300	1/19	665 ^c
Pesticides/PCBs ($\mu\text{g/L}$)			
2,4-Dichlorobiphenyl	25 J - 66 J	3/19	0.0008 ^{*a}
alpha Endosulfan	6.6	1/18	0.03 ^{*b}
alpha Chlordane	0.94 J - 3.2	2/18	0.001 ^{*a}
beta Endosulfan	9 J	1/18	0.03 ^{*b}
BHC (Hexachlorocyclohexane)	0.82 J - 5.6	3/18	0.06 ^{*b}
Dieldrin	3.7 J - 7.1 J	3/18	0.1 ^{*a}
Endrin	2.1 J - 5.8 J	3/18	0.8 ^{*a}
gamma Chlordane	1.1 J - 7.4	3/18	0.001 ^{*a}
Malathion	50	1/18	0.02 ^{*b}
Methoxychlor	3.6 J - 11 J	4/18	0.6 ^{*b}
Aroclor 1260	190 J - 790	2/18	0.0008 ^{*a}
p,p'-DDD	2 J - 540	8/18	0.01 ^{*a}
p,p'-DDE	0.97 J - 250	9/18	0.01 ^{*a}
p,p'-DDT	3.4 J - 1,000	8/18	0.01 ^{*a}
Metals (mg/L)			
Antimony	19.9	1/19	2.0 ^d
Arsenic	1.3 - 76.8	9/19	6 ^d
Copper	2.7 - 28.3	4/19	16 ^d
Lead	8.5 - 209	9/19	31 ^d
Manganese	30.8 - 11,600	7/19	460 ^d
Mercury	0.44	1/19	0.15 ^d
Nickel	6.4 - 23	2/19	16 ^d

* Criterion expressed as μg per gram of organic carbon; sediment concentrations adjusted based on sample-specific total organic carbon before comparison reported in "Frequency of Detection Above Most Stringent Criterion" column.

^a NYSDEC criterion for protection of human health -bioaccumulation.

^b NYSDEC criterion for protection of benthic aquatic life.

^c Federal guidance value, National Oceanic and Atmospheric Administration.

^d State criterion for metals in sediment.

Key:

J = Estimated concentration.

Note: The calculated 95% upper confidence limit (UCL) levels are presented in the RI report.

The Long-term Monitoring Baseline Study conducted in April 1999 generally concluded that VOC concentrations in groundwater were stabilizing or decreasing as compared to the results recorded during the 1994 RI.

Remedial Activities and Monitoring

In the spring of 2003, in accordance with the ROD, remedial activities began at Landfill 1. The remedial activities consisted of the regrading and capping of Landfill 1 with an impermeable cover, the installation of a groundwater/leachate collection trench along the western edge of Landfill 1, and the decommissioning of monitoring wells located within the construction limits. In November 2003, a performance test was conducted on the seven pump stations located along the groundwater/leachate collection trench (see Figure 3) to evaluate the necessity of a groundwater/leachate collection and treatment system.

Pump Station Results

Upon review of the analytical results, the design of the treatment system was suspended because at all pump station sample locations:

- The levels of inorganic contamination were indicative of background levels found throughout the base.
- PCB results were nondetect.
- VOCs were below groundwater standards or marginally exceeded groundwater standards, with the exception of Pump Station PS-04.
- SVOCs were below groundwater standards or marginally exceeded groundwater standards.

Four quarterly sampling rounds were then performed to substantiate the findings of the pump station performance test and determine if continuous operation of the trench system was warranted. The results from the four quarterly sampling rounds confirmed the overall groundwater observations reported during the November 2003 Pump Station Performance Test (see Table 6). The data was

evaluated using a statistical trend analysis, which supported the following conclusions:

- Levels of inorganic contamination reported at the seven pump stations had remained at concentrations indicative of background levels found throughout the base. Iron and manganese consistently exceeded the groundwater standard of 0.3 mg/L with concentrations of iron above the standard ranging from 0.327 mg/L to 25.5 mg/L and concentrations of manganese above the standard ranging from 0.611 mg/L to 11.2 mg/L.
- PCBs and pesticides were not detected at any sampling location during any sampling round.
- Several VOCs were reported at concentrations above state standards, however, the VOC exceedances reported between the April 2004 and December 2004 sampling rounds were at concentrations within one order of magnitude of the state standard and at similar levels to those reported in the November 2003 pump station performance test.
- SVOCs had remained at concentrations below groundwater standards with one exception. The concentration of 1,4- dichlorobenzene consistently exceeded the standard of 3 µg/L with concentrations above the standard ranging from 6 µg/L to 8 µg/L at four pump stations.
- The observed concentrations indicated an overall stable and/or decreasing trend.

Groundwater Monitoring

The results of the groundwater well quarterly sampling rounds indicated a Site-wide stabilization of all contaminants of concern, including VOCs and metals at Landfill 1, as reported in the Long-term Monitoring Report, November 2007. Several VOCs at several wells, however, continued to exceed the Class GA groundwater standards. The best use of Class GA waters is as a source of potable water. Therefore, comparison of the groundwater sample analytical results at Landfill 1 to Class GA standards is a conservative approach because it is unlikely that groundwater at the former base will be used as a source of potable water.

VOC exceedances have been reported at monitoring wells LF1P-2, LF1MW-5, and LF1MW-11, but only wells LF1MW-5 and LF1MW-11 have showed sustained exceedances of the groundwater standards. In well LF1P-2, benzene slightly exceeded the groundwater standard of 1 µg/L in six out of the 14 sampling rounds since December 2003. The concentrations ranged from 1.01 µg/L to 1.6 µg/L. In April 2007, the benzene concentration (0.67 µg/L) was below the standard.

In well LF1MW-5, benzene slightly exceeded the standard for 13 out of the 14 sampling rounds with concentrations ranging from 1.13 µg/L to 3.7 µg/L. In April 2007, the benzene concentration (0.74 µg/L) was below the standard. Three other VOCs (1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and m,p-xylene) exceeded the groundwater standards in 2003 and 2004, but have since been below the standard.

In well LF1MW-11, four VOCs exceeded the groundwater standards for 13 out of the 14 sampling rounds. With the exception of the April 2005 sampling round (when all the VOCs were below the groundwater standard), the highest concentration of these VOCs was in December 2003 and they have been steadily decreasing. The concentration of 1,2-dichlorobenzene (standard of 3 µg/L) decreased from a high of 13 µg/L to 6.69 µg/L in April 2007. The concentration of 1,4-dichlorobenzene (standard of 3 µg/L) decreased from a high of 16 µg/L to 7.84 µg/L in April 2007. The concentration of benzene decreased from a high of 4.9 µg/L to 2.09 µg/L in April 2007. The concentration of chlorobenzene (standard of 5 µg/L) decreased from a high of 17 µg/L to 8.1 µg/L in April 2007.

Iron and manganese exceeded the groundwater standard (0.3 mg/L) in all 14 sampling rounds in five monitoring wells and intermittently in three monitoring wells. Concentrations of iron above the standard ranged from 0.313 mg/L to 122 mg/L (unfiltered sample at LF1MW-14, 9/2005) and concentrations of manganese above the standard ranged from 0.307 mg/L to 11.6 mg/L. Elevated metals at the former Griffiss AFB have generally been found to be naturally occurring. Upgradient

monitoring well LF1MW-1R continues to show excessive concentrations of iron, even when the sample is filtered.

Surface Water Monitoring

There were no VOC exceedances of the NYSDEC Class A Surface Water Standards at the three surface water sampling locations during the 12 sampling rounds from December 2003 to April 2007. Iron and manganese exceeded the standard of 0.3 mg/L consistently at the three locations. Concentrations of iron above the standard ranged from 0.301 to 133 mg/L (sample collected 9/2006 at location where creek beds are orange, indicating iron staining) and concentrations of manganese above the standard ranged from 0.343 mg/L to 5.03 mg/L.

If future groundwater or surface water monitoring results indicate an increasing trend in the concentrations of COCs, the Air Force will assess the data/trends and submit a report to the EPA and NYSDEC. The regulatory agencies will have final approval of the criteria and decision regarding implementation of contingency measures after receiving the Air Force's assessment and recommendation in accordance with the Interagency Agreement.

Landfill Gas

The Landfill 1 Gas Summary Report was issued in June 2006. It identified three areas of concern related to landfill gas: former building 853 at the Small Arms Range, the leachate collection system components, and the northern property line. Building 853 has been demolished, the long term monitoring health and safety plan has been modified, and procedures have been implemented to address potential hazards related to the leachate collection system components. In addition, a passive gas trench has been installed to prevent the landfill gas from migrating beyond the northern property line. The property transfer documents for the Small Arms Range property adjacent to Landfill 1 will include a requirement to consult with the Air Force, EPA, and NYSDEC to either evaluate the vapor intrusion pathway or use mitigation measures in the construction of any future buildings to prevent potential health risks from migration of methane gas.

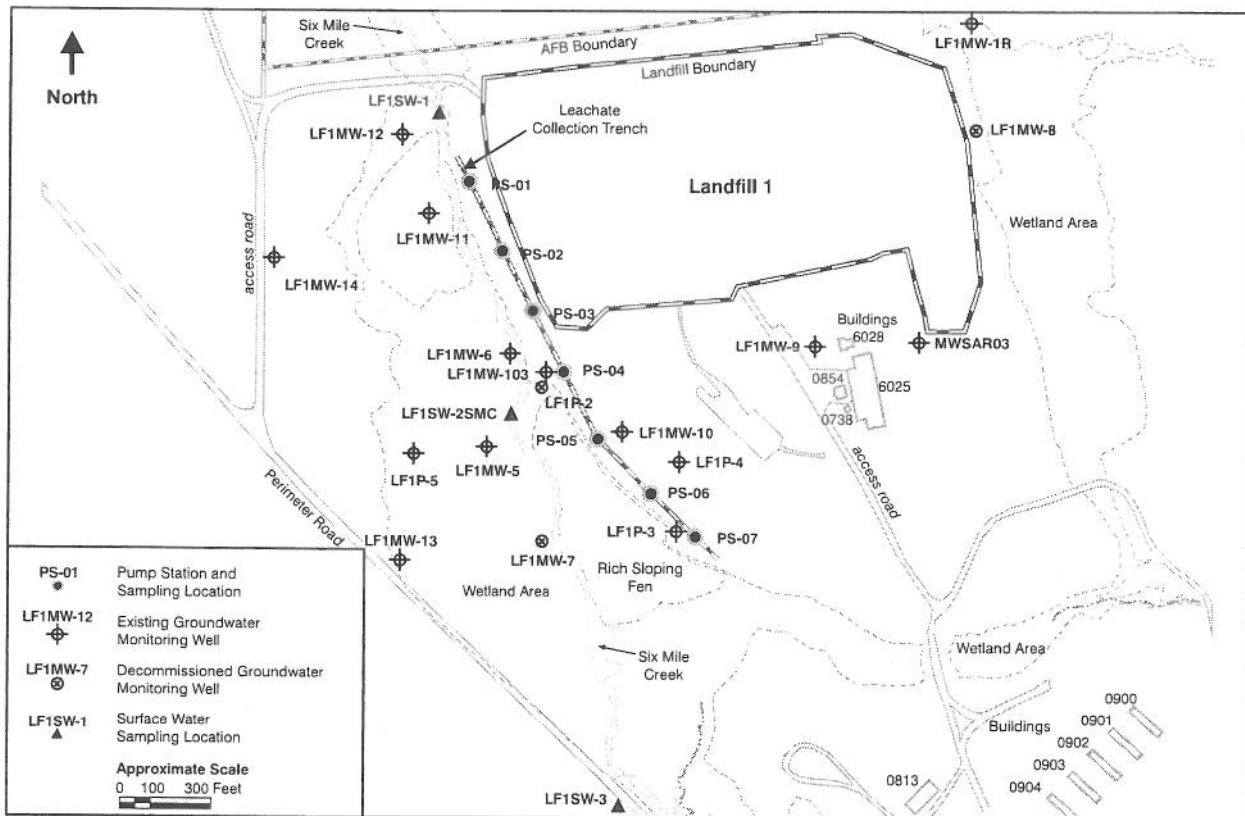


Figure 3: Leachate Collection Trench and Groundwater Sampling Locations

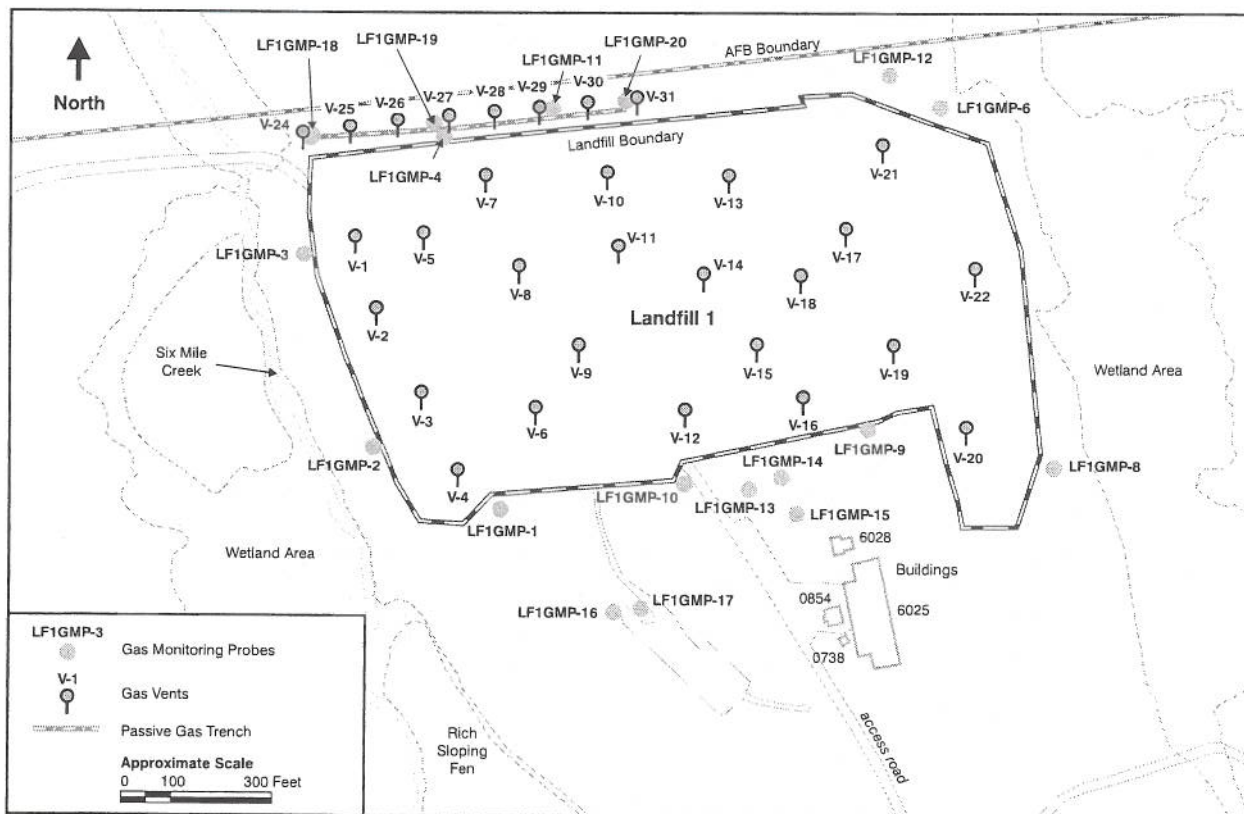


Figure 4: Gas Collection Trench and Network

**Table 6
PUMP STATION PERFORMANCE TEST GROUNDWATER
ANALYTICAL RESULTS (2003-2004)**

Pump Station	Compound (µg/L)	NYSDEC Class GA Groundwater Standard ¹	11/3/03 ²	4/28/04	6/30/04	9/20/04	12/17/04
PS-01	1,2,4-Trimethylbenzene	5	2.4	2.2 M	6 M	6.1	7.4
	1,3,5-Trimethylbenzene	5	2.5	0.66	0.38	2.2	4.5 M
	1,4-Dichlorobenzene	3	2.7	7	9.9 M	9.7	11
	Benzene	1	U	1.1	1.8	1.9	1.9
	Chlorobenzene	5	U	4.6 M	8.1 M	9.4	10
	Xylene (m+p)	5	1.6	0.73	1.8	2.3	3.5
PS-02	1,2,4-Trimethylbenzene	5	8	8.6	12	7.6 J	3.2
	1,3,5-Trimethylbenzene	5	5.3	3.6	2	UJ	U
	1,4-Dichlorobenzene	3	6.7	7.2	10	8 J	7
	Benzene	1	1.6	1.3	2.1	1.7J	0.73
	Chlorobenzene	5	6.4	6	9.2	7.7 J	3.7
	Xylene (m+p)	5	3.4	3.4	4.1	2.9 J	1.6
PS-03	1,2,4-Trimethylbenzene	5	26	1.3	1.8	11	0.7
	1,3,5-Trimethylbenzene	5	16	0.51	0.30	1.2	U
	1,4-Dichlorobenzene	3	3.4	7	6	9.9	5*
	Benzene	1	2.4	0.22	0.44	1.9	0.38
	Chlorobenzene	5	10	0.94	1.9	9.7	2.2
	Xylene (m+p)	5	14	0.60	0.82	5.1	0.6
PS-04	1,2,4-Trimethylbenzene	5	92	25	24	32	53
	1,3,5-Trimethylbenzene	5	48	19	18	18	28
	1,4-Dichlorobenzene	3	17	11	10	12	14
	Benzene	1	3	1.7	1.6	1.8	2.2
	Chlorobenzene	5	15	8.8	8.6	9.2	12
	Xylene (m+p)	5	80	7.8	8.7	13	34
PS-05	1,2,4-Trimethylbenzene	5	3.4	U	0.26	U	U
	1,3,5-Trimethylbenzene	5	2.1	U	U	U	U
	1,4-Dichlorobenzene	3	2.7	0.78	0.72	0.84	0.84
	Benzene	1	0.98	0.24	0.29	0.41	0.42
	Chlorobenzene	5	U	0.41	0.52	0.51	0.51
	Xylene (m+p)	5	3	U	U	U	U
PS-06	1,2,4-Trimethylbenzene	5	U	U	U	U	U
	1,3,5-Trimethylbenzene	5	U	U	U	U	U
	1,4-Dichlorobenzene	3	U	0.36	0.69	0.74	U
	Benzene	1	U	U	U	U	U
	Chlorobenzene	5	U	U	0.20	0.29	U
	Xylene (m+p)	5	U	U	U	U	U
PS-07	1,2,4-Trimethylbenzene	5	U	U	U	U	U
	1,3,5-Trimethylbenzene	5	U	U	U	U	U
	1,4-Dichlorobenzene	3	U	U	U	U	U
	Benzene	1	U	0.2	0.39	0.26	U
	Chlorobenzene	5	U	U	U	U	U
	Xylene (m+p)	5	U	U	U	U	U

¹ NYSDEC GW standard amended Aug. 99 (1,4 dichlorobenzene changed from 4.7 to 3, benzene 0.7 to 1).

² Highest result of three sampling rounds.

Key:

M = A matrix effect was present.

J = Estimated concentration.

U = The analyte was analyzed for, but not detected.

UJ = The result is estimated at the method detection limit.

SUMMARY OF SITE RISKS

Site risks were analyzed based on the extent of contamination at the Landfill 1 AOC. As part of the RI, a baseline risk assessment was conducted in 1994 to evaluate current and future potential risks to human health and the environment associated with contaminants found in the soils, sediments, surface water, and groundwater at the Site. The results of this assessment were considered in the cleanup goal selection process.

Human Health Risk Assessment Background Information

A baseline human health risk assessment was conducted during the RI to determine whether chemicals detected at the Landfill 1 AOC could pose health risks to individuals under current and proposed future land uses if no remediation occurs. As part of the baseline risk assessment, the following four-step process was used to assess Site-related human health risks for a reasonable maximum exposure scenario: (1) Hazard identification-identifies the contaminants of concern at the Site based on several factors such as toxicity, frequency of occurrence, and concentration; (2) Exposure Assessment-estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathway (e.g., ingestion of contaminated soils) by which humans are potentially exposed; (3) Toxicity Assessment-determines the types of adverse health effects associated with chemical exposures and the relationship between magnitude of exposure (dose) and severity of adverse effects (response); and (4) Risk Characterization-summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative (e.g., one-in-a-million excess cancer risk and non-cancer Hazard Index value) assessment of Site-related risks and a discussion of uncertainties associated with the evaluation of the risks and hazards for the Site.

Chemicals of potential concern were selected for use in the risk assessment based on the analytical results and data quality evaluation. All contaminants detected in the soil, sediments, surface water, and groundwater at the Site were considered chemicals of potential concern with the exception of inorganics detected at concentrations less than twice the mean background concentrations; iron, magnesium,

calcium, potassium, and sodium, which are essential human nutrients; and compounds detected in less than 5 % of the total samples (unless they were known human carcinogens). Petroleum hydrocarbons as a class were not selected as chemicals of concern in the risk assessment, but the individual toxic constituents (e.g., benzene, toluene, ethylbenzene) were evaluated. The presence of petroleum hydrocarbons as a class of contaminants was considered in the selection of the preferred remedial action.

The current and future land use designations for the Landfill 1 AOC are open space and wetlands. The human health risk assessment evaluated exposure to potential residential, agricultural, recreational, and occupational (landscape worker and future industrial worker) populations that may be exposed to chemicals detected in the Site media. The various exposure scenarios for each population are described in Table 7. Intake assumptions, which are based on EPA guidance, are more fully described in the RI.

Quantitative estimates of carcinogenic and non-carcinogenic risks were calculated for the Landfill 1 AOC as part of a risk characterization. The risk characterization evaluates potential health risks based on estimated exposure intakes and toxicity values. For carcinogens, risks are estimated as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to the potential carcinogen. The risks of the individual chemicals are summed for each pathway to develop a total risk estimate. The range of acceptable risk is generally considered to be 1 in 10,000 (1×10^{-4}) to 1 in 1,000,000 (1×10^{-6}) of an individual developing cancer over a 70-year lifetime from exposure to the contaminant(s) under specific exposure assumptions. Therefore, sites with carcinogenic risk below the risk range for a reasonable maximum exposure do not generally require cleanup based upon carcinogenic risk under the NCP.

To assess the overall noncarcinogenic effects posed by more than one contaminant, EPA has developed the Hazard Quotient (HQ) and Hazard Index (HI). The HQ is the ratio of the chronic daily intake of a chemical to the reference dose for the chemical. The reference dose is an estimate (with uncertainty spanning perhaps an order of magnitude or greater) of a daily exposure level for the human population, including sensitive sub-populations, that is likely to be without an appreciable risk of deleterious effects during a portion of a lifetime. The HQs are summed for all contaminants within an exposure pathway (e.g., ingestion of soils) and across pathways to determine the HI. When the HI exceeds 1, there may be concern for potential noncarcinogenic health effects if the contaminants in question are believed to cause similar toxic effects.

EPA bases its decision to conduct site remediation on the risk to human health and the environment. Cleanup actions may be taken when EPA determines that the risk at a site exceeds the cancer risk level of 1 in 10,000 (1×10^{-4}) or if the noncarcinogenic HI exceeds 1. Once either of these thresholds has been exceeded, the 1 in 1,000,000 (1×10^{-6}) risk level and an HI of 1 or less may be used as the point of departure for determining remediation goals for alternatives.

Results of Site-Specific Health Risk Assessment Carcinogenic Risk

Because carcinogenic risks are based on total lifetime exposure, the calculated risk to the adult residential, agricultural, and recreational receptor (30-year exposure assumption versus a 6-year exposure assumption for a child) was used; therefore, only the carcinogenic risks to the adults were presented in the RI report. Additional specific exposure assumptions are described in the RI report.

The total carcinogenic risk to an adult resident and an adult agricultural receptor was calculated as 3 in 10,000 (3×10^{-4}), exceeding EPA's target lifetime excess cancer risk range as a result of the risk posed by ingestion of groundwater.

The total carcinogenic risk for an adult recreational receptor was calculated as 9 in 1,000,000 (9×10^{-6}), which is within the EPA's target risk range.

The total carcinogenic risk for landscape workers (25-year exposure assumption) was calculated as 9 in 10,000,000 (9×10^{-7}), which is below the EPA's target range. The total carcinogenic risk for an industrial worker (25-year exposure assumption) exposed to groundwater was 6 in 100,000 (6×10^{-5}), which is within the EPA's target risk range.

**Table 7
LANDFILL 1 AOC
RISK ASSESSMENT EXPOSURE SCENARIOS**

Residential and Agricultural Receptors	Recreational Receptor	Landscape Worker	Industrial Worker
Adult, Child, Youth, Adolescent	Adult, Child, Youth, Adolescent	Adult	Adult
<ul style="list-style-type: none"> • Ingestion of groundwater • Dermal contact with groundwater • Inhalation of VOCs from groundwater 	<ul style="list-style-type: none"> • Inhalation of airborne chemicals • Inhalation of fugitive dust from surface soil • Incidental ingestion of surface soil • Dermal contact with surface soil • Incidental ingestion of surface water • Dermal contact with surface water • Incidental ingestion of sediments • Dermal contact with sediments 	<ul style="list-style-type: none"> • Incidental ingestion of surface soil • Inhalation of fugitive dust from surface soil • Dermal contact with surface soil • Inhalation of airborne chemicals 	<ul style="list-style-type: none"> • Ingestion of groundwater • Dermal contact with groundwater • Inhalation of VOCs from groundwater

SUMMARY OF SITE RISKS (Cont.)

Noncarcinogenic Risk

For noncarcinogenic risks, the child is the receptor generally assumed to have the greatest estimated risk; therefore, HIs were calculated for the adult, adolescent, youth, and child. The total HIs for the future residential adult, adolescent, youth, and child were calculated as 8, 9, 10, and 20, respectively, all exceeding the acceptable level of 1. Ingestion of groundwater contaminated with manganese, cadmium, and arsenic contributed the majority of the risk. The HIs for all other exposure pathways for receptors of all ages were below the acceptable level of 1.

The total HIs for adult, adolescent, youth, and child agricultural receptors were calculated as 8, 9, 10, and 20, respectively, due to the ingestion of groundwater contaminated with manganese, cadmium, and arsenic. The HIs for all other exposure pathways for receptors of all ages were below the acceptable level of 1.

The total HIs for the current and future recreational adult, adolescent, youth, and child were calculated as 0.06, 0.06, 0.1, and 0.4, respectively, all below the acceptable level of 1, indicating that adverse noncarcinogenic health effects are not expected to occur.

The total HI for a landscape worker was 0.02, which is below the acceptable level of 1. Therefore, potential adverse noncarcinogenic health effects are not expected to occur. The total HI for an industrial worker exposed to groundwater was 2, which exceeds the acceptable level. Ingestion of groundwater contaminated with manganese was the greatest contributor to the risk.

The results of the human health baseline risk assessment indicate that chemicals detected in air, surface soil, groundwater, surface water, and sediments likely do not present an unacceptable risk to potentially exposed populations as long as groundwater is not used for drinking water. The quantitative evaluation of risk is subject to several conservative assumptions.

Uncertainties

Uncertainties exist in many areas of the human health risk assessment process. However, use of conservative variables in intake calculations and health protective assumptions throughout the entire risk assessment process results in an assessment that is protective of human health and the environment. Examples of uncertainties associated with the risk assessment for this AOC include (1) Chemical samples for the groundwater and leachate were collected from the suspected source of contamination rather than through random sampling, which may result in a potential overestimate of risk for those pathways; (2) The noncarcinogenic risks associated with dermal contact with soil and sediment were not quantified for the majority of COPCs, which may lead to underestimation of the overall risk due to dermal contact; (3) The models used in the RI are likely to overestimate exposure point concentrations in air, which would cause an overestimation of risk for the inhalation pathway; (4) Inhalation reference doses and cancer slope factors were not available for many chemicals detected in soils and groundwater which would result in a potential underestimation of risk for the inhalation pathway; and (5) The model used in the RI to estimate exposure point concentrations in crops irrigated with groundwater may under- or overestimate risk through the crop ingestion pathway.

Ecological Risk Assessment

A baseline risk assessment for ecological receptors at the Landfill 1 AOC was conducted during the RI. The environmental evaluation modeled risks to raccoons, shrews, and American woodcocks from exposures to surface soil, surface water, and sediment.

The HQs indicative of risks to the raccoon were calculated to be below 1; therefore, the potential for adverse effects to this ecological receptor is considered to be insignificant. The HQ for the short-tailed shrew exceeded 1 for one out of over 100 chemicals (4 chloro-2-methyl phenoxyacetic acid [MCPA], HQ = 6.6). For the American woodcock, the HQ exceeded 1 for two chemicals (MCPA, HQ = 3.6; and strontium, HQ = 1.2).

These values indicate a potential for adverse effects.

Modeling of bioaccumulation to higher order species was not performed, which tends to underestimate the risk to ecological receptors. Also, the risks to ecological receptors in impacted areas (e.g., Six Mile Creek) were not considered in this AOC's risk assessment but were considered in the selection of the preferred remedial action.

There are no plant or animal species at the former base that are considered to be threatened or endangered by the U.S. Department of the Interior. However, whorled-mountain mint, a listed New York State threatened plant species, has been identified adjacent to the wetlands along Six Mile Creek.

The ecological and human health risk assessments performed using the RI data are still appropriate, though conservative, since concentrations of the COCs have been decreasing since the RI samples were collected.

REMEDIAL ACTION

Remedial Action Objectives

The following are the remedial action objectives developed for this Site based upon the use of the presumptive remedy guidance and the Site data:

- Consolidation of various debris and waste areas into the main landfill boundary in order to reduce the area to be capped and the potential for nearby wildlife and human populations to be exposed to the landfill mass;
- Significantly reduce infiltration of rain water and snow-melt water through the landfill mass in order to minimize the potential for leachate generation and groundwater contamination; and
- ~~Collection and treatment of groundwater/leachate in order to reduce or eliminate the discharge of contaminants to the environment; and~~
- Monitoring groundwater and stream environment (which may include, but is not necessarily limited to, sediment, surface water, and biota) downgradient of the Site to evaluate the effectiveness of the presumptive remedy.

Description and Evaluation of Remedial Action Alternatives

CERCLA regulations mandate that a remedial action must be protective of human health and the environment, cost effective, and utilize permanent solutions and treatment technologies to the maximum extent practicable. These regulations also establish a preference for remedial actions that employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of contaminants at a site. As part of the presumptive remedy approach, this revised proposed plan evaluates a no action scenario as dictated by CERCLA and compares it to the presumptive remedy alternative. A summary of the two alternatives is presented below.

Under the No Action Alternative, no remedy would be implemented at the Landfill 1 AOC. Landfill 1, however, was shown to be a potential threat to human health under residential and agricultural future-use scenarios. The No Action alternative was, therefore, rejected due to its inability to meet the threshold requirements of an appropriate alternative.

The Presumptive Remedy Alternative includes (1) implementation of institutional controls in the form of deed restrictions of the main landfill boundary and the contaminated groundwater plume area to prevent exposure to contaminated landfill mass groundwater; ~~(2) collection of leachate/groundwater from a trench located at the landfill toe;~~ ~~(3) treatment of collected groundwater by carbon adsorption and discharge of treated water into Six Mile Creek;~~ (2) installation and maintenance of an impermeable cover in accordance with 6 NYCRR Part 360 landfill closure regulations dated November 26, 1996; (3) maintenance of the impermeable cover and long term monitoring of the groundwater, surface water, sediment, and landfill gas in accordance with 6 NYCRR Part 360 landfill post-closure regulations dated November 26, 1996; and (4) monitoring the groundwater and stream environment downgradient of the Site to evaluate the effectiveness of the presumptive remedy. Any rare plants, significant communities or wetlands disturbed during the remedial action will be restored. This alternative satisfies the first eight "threshold" criteria listed below and ensures compliance with applicable regulations.

Evaluation Criteria for Remedial Action Alternatives

Remedial alternatives are assessed on the basis of both a detailed and a comparative analysis pursuant to the NCP. The detailed analysis of Landfill 1 consisted of (1) an assessment of the individual alternatives against nine evaluation criteria and (2) a comparative analysis focusing upon the relative performance of each alternative against the criteria. In general, the following “threshold” criteria must be satisfied by an alternative for it to be eligible for selection:

1. Overall protection of human health and the environment addresses whether a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.
 2. Compliance with ARARs addresses whether a remedy would (1) meet all of the ARARs or (2) provide grounds for invoking a waiver.
- In addition, the following “primary balancing” criteria are used to make comparisons and identify the major trade-off among alternatives:
3. Long-term effectiveness and permanence refers to the ability of a remedy to maintain reliable protection of human health and the environment over time once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.
 4. Reduction of toxicity, mobility, or volume via treatment refers to a remedial technology’s expected ability to reduce the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants at the site.

5. Short-term effectiveness addresses (1) the period of time needed to achieve protection and (2) any adverse impacts on human health and the environment that may be posed during the construction and implementation periods until cleanup goals are achieved.
6. Implementability refers to the technical and administrative feasibility of a remedy, including the availability of materials and services needed.
7. Cost includes estimated capital, operation and maintenance, and present-worth costs.

Finally, the following “modifying” criteria are considered fully after the formal public comment period on the revised proposed plan is complete:

8. State acceptance indicates whether, based on its review of the RI and the revised proposed plan, the State supports or opposes the preferred alternative and/or has identified any reservations with respect to the preferred alternative.
9. Community acceptance refers to the public’s general response to the alternatives described in the revised proposed plan and the RI reports. Factors of community acceptance include support, reservation, or opposition by the community.

SELECTION OF THE PREFERRED ALTERNATIVE

The proposed remedial action alternative for the Landfill 1 AOC is the Presumptive Remedy. This alternative was chosen because it has been demonstrated to be effective for similar military landfills and is known to be both cost effective and easy to implement. The first eight “threshold” criteria that make an alternative eligible for selection are satisfied by the Presumptive Remedy. Community acceptance (criterion 9) cannot be determined prior to the public meeting.

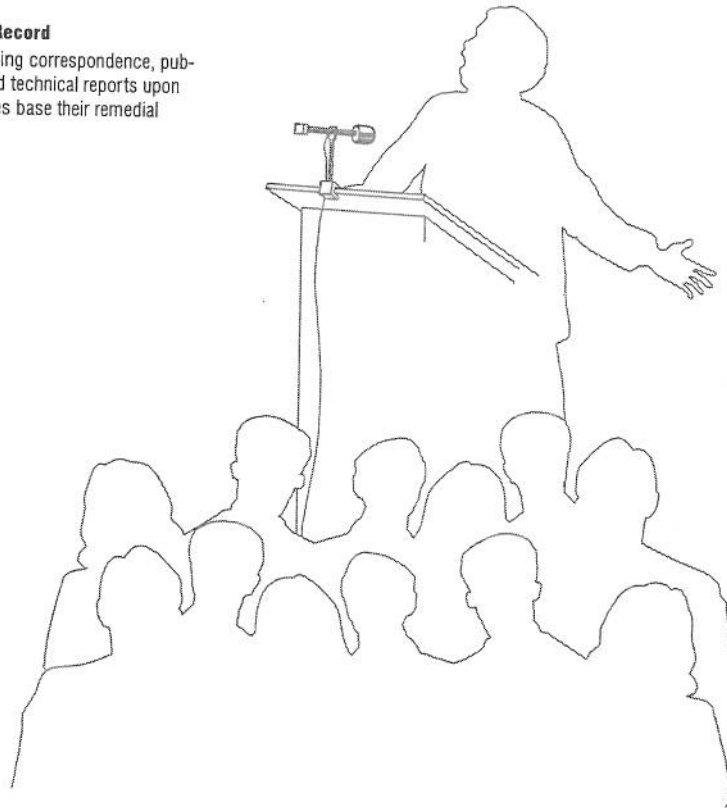
COMMUNITY PARTICIPATION

The agencies desire to have an open dialogue with citizens concerning the results of the RI and encourage citizens to participate by commenting on this revised proposed plan. This interaction between the agencies and the public is critical to the CERCLA process and to making sound environmental decisions. Details on this site, the environmental program, and all reports referred to in this document are available for review in the *administrative record* file located at 153 Brooks Road in the Griffiss Business and Technology Park and on the administrative record Web site found at <https://afarpaar.af.mil/ar/docsearch.aspx>.

Administrative Record

documents including correspondence, public comments, and technical reports upon which the agencies base their remedial action selection.

The public is encouraged to review all aspects of the RI and administrative record and comment on the agencies' revised proposed plan remedial action proposal. The agencies will consider all public comments on this revised proposed plan in preparing the ROD. Depending on comments received, the plan presented in the ROD amendment could be different from the preferred alternative presented in this revised proposed plan. All written and verbal comments will be summarized and responded to in the responsiveness summary section of the ROD amendment.



How You Can Participate

Whether you are reading this type of document for the first time or are familiar with the Superfund process, you are invited to participate in the process.

- Read this revised proposed plan and review additional documents in the administrative record file.
- Contact the Air Force, EPA, or NYSDEC project managers listed on page 21 to ask questions or request information.
- Attend a public meeting and give verbal comments (see details below).
- Submit written comments (see comment form on back cover) by October 25, 2008.

Public Comment Period

The agencies have set a public comment period from September 25 to October 25, 2008, to encourage public participation in the selection process. Written comments should be sent to:

Mr. Michael McDermott
BRAC Environmental Coordinator
Air Force Real Property Agency
153 Brooks Road
Rome, NY 13441

Public Meeting

The comment period includes a public meeting at which the Air Force will present the revised proposed plan. Representatives from the agencies will be available to answer questions and accept both oral and written comments. The public meeting is scheduled for 5:00 p.m., Wednesday, October 8, 2008, and will be held at MVE Conference Room, Air Force Real Property Agency, 153 Brooks Road, Griffiss Business and Technology Park, Rome, New York.

Environmental Timeline Landfill 1

Problem Identification/
Records Search: 1981
|
Problem Confirmation
and Quantification: 1982
|
Field Investigation: 1985
|
Griffiss AFB added to
National Priorities List: 1987
|
ATSDR Health Assessment: 1988
|
EPA, NYSDEC, and Air Force enter into
Federal Facility Agreement: 1990
|
Griffiss designated for
realignment by BRAC:
1993 and 1995
|
ATSDR Health Assessment: 1995
Addendum: 1996
|
Remedial Investigation Report
Draft-final: December 1996
|
Landfill Cover Investigation Report
Final: December 1997
|
Supplemental Investigation Report
Final: July 1998
|
Remedial Action Proposed Plan
Final: July 1999
|
Public Comment Period:
July 20, 1999 - August 19, 1999
|
Record of Decision
Final: February 2000
|
Long-term Monitoring
Baseline Study Report
Final: March 2000
|
Landfill 1 Cover Improvements
Engineer's Certification Report
Final: February 2005
|
Final Evaluation Report
Landfill 1 Groundwater/
Leachate Collection Trench
Final: January 2007
|
Revised Proposed Plan
Final: September 2008

More Griffiss Air Force Base Environmental Information

General information concerning the environmental program at the former Griffiss AFB can be found at the AFRPA offices at 153 Brooks Road, Rome, New York, 13441. Visit the office or call (315-356-0810) to ask about the installation activities or request background information.



Additional Information

Three agencies have been identified in the Federal Facility Agreement: Air Force, NYSDEC, and EPA. The agreement ensures that environmental impacts on public health, welfare, and the environment associated with past and present activities at the former Griffiss AFB are thoroughly investigated and appropriate remedial actions are taken as necessary to protect the public health, welfare, and the environment. Any of the following agency representatives may be contacted to obtain additional information:



The **Air Force** is legally responsible for the environmental activities at the former Griffiss AFB. Since this Site is on the National

Priorities List, all investigations and cleanup plans are finalized only after consultation with EPA and NYSDEC. For additional information concerning the environmental program at the former Griffiss AFB and the Air Force's role in preparing this proposed plan, contact:

Mr. Michael McDermott
BRAC Environmental Coordinator
Air Force Real Property Agency
153 Brooks Road
Rome, NY 13441
(315) 356-0810



The **New York State Department of Environmental Conservation**

For additional information concerning the state's role in preparing this proposed plan, contact:

Ms. Heather Bishop
New York State Department of Environmental Conservation
625 Broadway, 11th Floor
Albany, NY 12233
(518) 402-9692



The **U.S. Environmental Protection Agency**

For additional information concerning the EPA's role in preparing this proposed plan, contact:

Mr. Douglas Pocze
U.S. Environmental Protection Agency,
Region II
290 Broadway, 18th floor
New York, NY 10007-1866
(212) 637-4432



(Comments continued. Attach additional pages, if necessary.)

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Place
Stamp
Here

Mr. Michael McDermott
BRAC Environmental Coordinator
Air Force Real Property Agency
153 Brooks Road

Landfill 1 AOC

This comment form is provided for your convenience in submitting written comments to the Air Force concerning Landfill 1 AOC. If you would like to receive a copy of the Record of Decision Amendment and Responsiveness Summary, which address public comments received on this project, please make sure the information on the mailing label below is correct.

Comments:

(continued on reverse)

BRAC Environmental Coordinator
Air Force Real Property Agency
153 Brooks Road
Rome, NY 13441

*This mailing
is to inform you of
the revised proposed
environmental plan for
the Landfill 1 AOC at the
former Griffiss AFB,
and to solicit
your comments.*