

New York



Long-Term Stewardship Site Highlights

Ashland Oil #1 Site (page 3)
unknown

Ashland Oil #2 Site (page 5)
unknown

Bliss and Laughlin Steel Site (page 7)
unknown

Brookhaven National Laboratory (page 9)
Major Activities - groundwater extraction, treatment, and monitoring; soil/sediment monitoring; access restrictions and other institutional controls; maintenance of capped landfills; surveillance and maintenance of two reactors
Site Size - 2,153 hectares (5,263 acres)
Estimated Average Annual Costs FY 2000-2006 - None. Monitoring costs of remediated locations and facilities, as well as operations, maintenance and monitoring costs for treatment systems, are incorporated in the site Environmental Management budget for FY 2000- 2006.

Colonie Site (page 29)
unknown

Linde Air Products (page 31)
unknown

Niagara Falls Storage Site (page 33)
unknown

Seaway Industrial Park (page 35)
unknown

Separation Process Research Unit (page 37)
Site Size - 8 hectares (20 acres)
Current Landlord - U.S. Department of Energy, Office of Naval Reactors
Expected Future Landlord - U.S. Department of Energy, Office of Naval Reactors

West Valley Demonstration Project (page 41)
Site Size - 90 hectares (230 acres)
Current Landlord - U.S. Department of Energy; New York State Energy Research and Development Authority
Expected Future Landlord - New York State Energy Research and Development Authority

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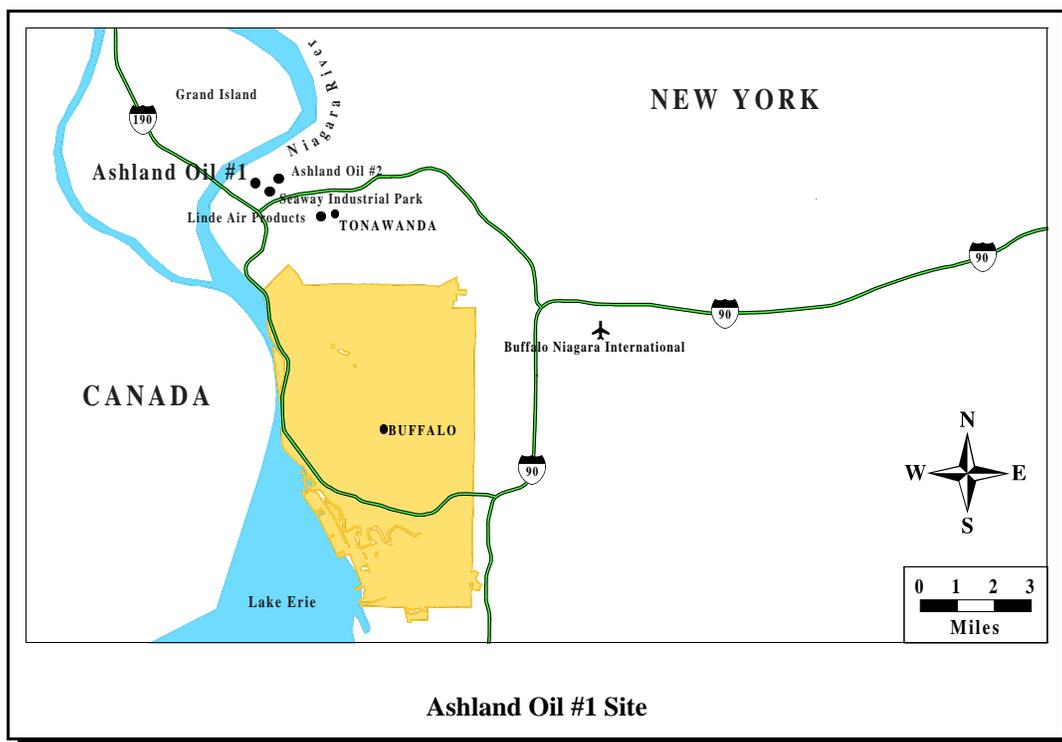
ASHLAND OIL #1 SITE¹

SITE SUMMARY

The Ashland Oil #1 Site is located in an industrialized area of Tonawanda, New York, and is approximately five kilometers (three miles) northwest of the City of Buffalo. The property is bordered on the north and west by United Refining Company, on the east by Penn Central Transportation Company, on the southwest by Interstate 90, and on the northeast by Seaway Industrial Park. The Ashland Oil #1 Site was used as a storage site for uranium processing residues. While most of the land near the Ashland Oil #1 Site is zoned for industrial use, much of it remains undeveloped.

In the 1940s, the Manhattan Engineer District (MED) (an early predecessor agency to the U.S. Department of Energy) purchased the Ashland Oil #1 property (formerly known as the Haist Property) for use as a disposal site of uranium ore tailings and concentrated refining residues generated at the nearby Linde Air Products Site. The uranium residues were transported to the Ashland Oil #1 Site and were spread over the property.

In the 1960s, the U.S. Atomic Energy Commission (the successor agency to MED and a predecessor agency to the U.S. Department of Energy) determined that the levels of residual radioactivity at the Ashland Oil #1 Site were below then-current criteria. The Ashland Oil Company acquired the property and, in the 1970s, constructed a bermed area and two petroleum storage tanks. During construction of the bermed area and a drainage ditch,



¹ The Ashland Oil #1 Site is one of the 21 Formerly Utilized Sites Remedial Action Program (FUSRAP) sites where cleanup responsibility was transferred to the U.S. Army Corps of Engineers (Corps) in accordance with the Energy and Water Development Appropriations Act for FY 1998. At these 21 sites, the Corps is responsible for remediation and DOE is responsible for long-term stewardship activities, if any are deemed necessary. The cleanup decisions for these sites are not yet final and, therefore, the extent of long-term stewardship required for these sites, if any, is not yet known.

the Ashland Oil Company deposited most of the excavated soil into the nearby Seaway Landfill and Ashland #2 properties. In the late 1980s, Ashland Oil removed the storage tanks but left the berms in place. That same year, the results of remedial investigation activities indicated that soil contained residual radioactivity above now-current guidelines. The primary contaminants of concern are uranium, radium-226, and thorium-230.

The Ashland Oil Company remains the owner of most of the Ashland Oil #1 Site. The company retained the portion of the property where radioactive material was present but sold the balance of the production and storage tank areas to United Refining. United Refining plans to remove the refining equipment and use the property as a tank farm and transfer station.

The Corps' remedial action for the Ashland Oil #1 Site is not yet complete and, therefore, the extent of long-term stewardship required, if any, is not yet known. Ashland Oil #1, Ashland Oil #2, the Seaway Industrial Park, and the Linde Air Products Site are included in the Tonawanda Site integrated environmental documentation process to comply with requirements of the *Comprehensive Environmental Response, Compensation, and Liability Act* and the *National Environmental Policy Act*.

For additional information about the Ashland Oil #1 Site, please contact:

FUSRAP Public Information Center
Buffalo District
U.S. Army Corps of Engineers
1776 Niagara Street
Buffalo, NY 14207-3199
Phone: 800-833-6390
or visit the Internet website at: <http://www.lrb.usace.army.mil>

ASHLAND OIL #2 SITE¹

SITE SUMMARY

The Ashland Oil #2 Site is located in the Town of Tonawanda, New York, approximately five kilometers (three miles) northwest of Buffalo. The site is bordered by undeveloped privately- and publicly-owned property. The Ashland Oil #2 Site was used as a landfill for soil contaminated with uranium residues.

From the 1950s to the 1980s, the Ashland Oil Co. used a portion of the Ashland Oil #2 Site as a landfill for the disposal of general plant refuse and industrial and chemical wastes and materials. During the 1970s and early 1980s, the Ashland Oil Co. transported an unknown quantity of soil mixed with radioactive residues from the Ashland Oil #1 Site to the Ashland Oil #2 landfill. The soil at the Ashland Oil #1 Site had been contaminated by radioactive residues which originated from uranium processing activities at the nearby Linde Air Products Site. In the early 1980s, the Ashland Oil Co. closed the Ashland Oil #2 Site landfill and covered it with clay.

During the late 1970's and the 1980's, the U.S. Department of Energy (DOE) conducted four characterization studies at the Ashland Oil #2 Site to evaluate the radioactive contaminants and hydrogeological characteristics of the site. These studies determined that soil at the site contained residual radioactivity at levels exceeding Federal guidelines. The soil is contaminated with thorium and radium; the underlying groundwater has also been contaminated by thorium-238, radium-226, and uranium.



¹ The Ashland Oil #2 Site is one of the 21 Formerly Utilized Sites Remedial Action Program (FUSRAP) sites where cleanup responsibility was transferred to the U.S. Army Corps of Engineers (Corps) in accordance with the Energy and Water Development Appropriations Act for FY 1998. At these 21 sites, the Corps is responsible for remediation and DOE is responsible for long-term stewardship activities, if any are deemed necessary. The cleanup decisions for these sites are not yet final and, therefore, the extent of long-term stewardship required for these sites, if any, is not yet known.

The Corps' remedial action for the Ashland Oil #2 Site is not yet complete and, therefore, the extent of long-term stewardship required, if any, is not yet known. Ashland Oil #1, Ashland Oil #2, the Seaway Industrial Park, and the Linde Air Products Sites are included in the Tonawanda Site integrated environmental documentation process to comply with requirements of the *Comprehensive Environmental Response, Compensation, and Liability Act* and the *National Environmental Policy Act*.

For additional information about the Ashland Oil #2 Site, please contact:

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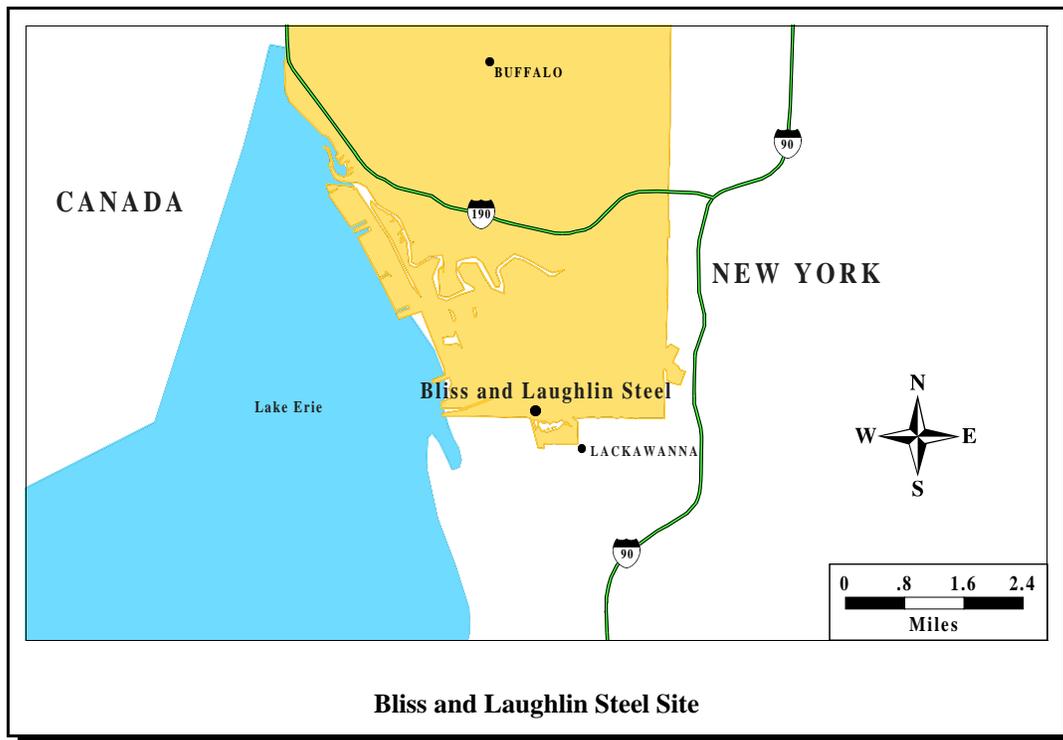
BLISS AND LAUGHLIN STEEL SITE¹

SITE SUMMARY

The Bliss and Laughlin Steel Site is located in Lackawanna, New York, just south of Buffalo. The Site is bordered on the south and west by a railroad right-of-way and on the east by Hopkins Street. A large asphalt parking lot is located in the northeastern portion of the property.

The Bliss & Laughlin Steel Company historically was a large processor of cold drawn steel. In the early 1950s, Bliss and Laughlin performed machining and straightening operations on uranium rods in support of Atomic Energy Commission (a predecessor agency to the U.S. Department of Energy) activities. The Atomic Energy Commission (AEC) records suggest that the work was performed for the National Lead Company of Ohio, an AEC prime contractor, and various AEC organizations. Records also indicate that drums of turnings generated by Bliss and Laughlin activities were removed from the Site. Bliss and Laughlin sold the facility to Ramco Steel, Inc. Later, Niagara Cold Drawn Corporation owned and occupied the sole building on the Site.

A radiological survey found low levels of contamination in the floors and in a few overhead areas. The contaminant of concern for the facility at the Bliss and Laughlin Steel Site is uranium. The contamination is believed to be fully contained within the building.



¹ The Bliss and Laughlin Steel Site is one of the 21 Formerly Utilized Sites Remedial Action Program (FUSRAP) sites where cleanup responsibility was transferred to the U.S. Army Corps of Engineers (Corps) in accordance with the Energy and Water Development Appropriations Act for FY 1998. At these 21 sites, the Corps is responsible for remediation and DOE is responsible for long-term stewardship activities, if any are deemed necessary. The cleanup decisions for these sites are not yet final and, therefore, the extent of long-term stewardship required for these sites, if any, is not yet known.

The Corps' remedial action for the Bliss and Laughlin Steel Site is not yet complete and, therefore, the extent of long-term stewardship required, if any, is not yet known.

For additional information about the Bliss and Laughlin Steel Site, please contact:

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BROOKHAVEN NATIONAL LABORATORY

1.0 SITE SUMMARY

1.1 Site Description and Mission

Brookhaven National Laboratory has been involved in research and development activities in support of the Department of Energy (DOE) and its predecessor agencies since it was established in 1947. Formerly Camp Upton, a U.S. Army installation site, Brookhaven is a 2,153-hectare (5,263-acre) site on Long Island in Upton, Suffolk County, New York, approximately 97 kilometers (60 miles) east of New York City. Approximately 8,000 people live within one half kilometer (0.3 mile) of the Brookhaven National Laboratory site boundary, and approximately 500,000 people live within 20 kilometers (miles) of the site boundary.

Brookhaven National Laboratory's current mission is to conduct fundamental research, including conception, design, construction, and operation of large, complex research facilities. These facilities carry out both basic and applied research in high-energy, nuclear and solid-state physics; fundamental material and structural properties and the interactions of matter; nuclear medicine, biomedical and environmental sciences; and energy technologies. The laboratory is operated by Brookhaven Science Associates, a partnership of Battelle Memorial Institute and the State University of New York at Stony Brook. The DOE Office of Science is the landlord for Brookhaven National Laboratory's ongoing research mission.

1.2 Site Cleanup and Accomplishments

Brookhaven was added to New York State's List of Inactive Waste Sites in 1980 and the Federal National Priorities List in November 1989. A tri-party Federal Facilities Compliance Agreement (also known as the Interagency Agreement) subsequently was negotiated between DOE, the U.S. Environmental Protection Agency (EPA) Region II, and the New York Department of Environmental Conservation. This Agreement, which became effective in 1992, integrates requirements under the *Resource Conservation and Recovery Act (RCRA)*, the *Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)*, DOE cleanup authorities under the *Atomic Energy Act*, and applicable New York State requirements.

The Federal Facilities Compliance Agreement provides the overall framework for conducting the environmental restoration program, including procedures for dispute resolution, assessment of stipulated penalties by EPA, document review, reporting and notification, schedule extensions, compliance with applicable or relevant and appropriate requirements, and reimbursement of New York State oversight costs.

The facility is divided into 29 Areas of Concern that have been grouped into "Operable Units" (OU) based on

LONG-TERM STEWARDSHIP HIGHLIGHTS

Major Long-Term Stewardship Activities - groundwater extraction, treatment, and monitoring; soil/sediment monitoring; access restrictions and other institutional controls; maintenance of capped landfills; surveillance and maintenance of two reactors

Total Site Area - 2,153 hectares (5,263 acres)

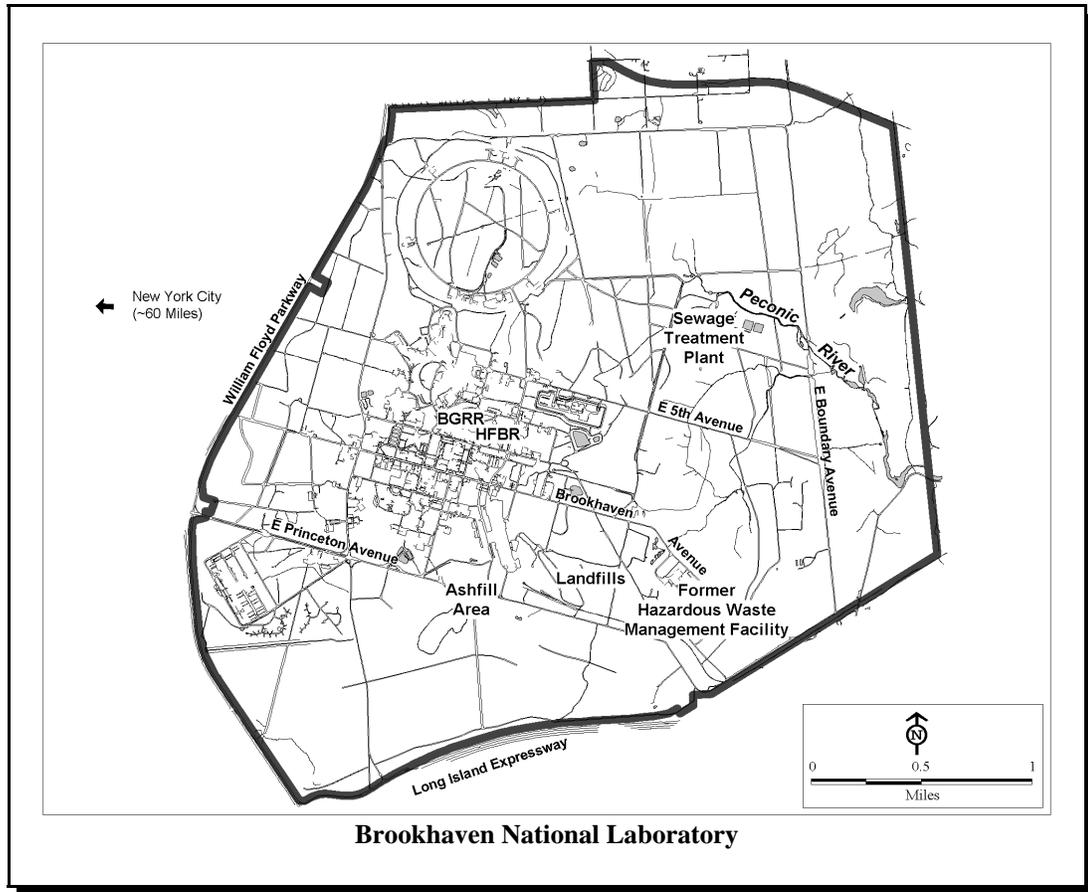
**Estimated Volume of Residual Contaminants* - soil 1,911 cubic meters (2,500 cubic yards); groundwater unknown; facilities unknown; surface water/sediment unknown; engineered units unknown

Portions in Long-Term Stewardship as of 2006 - 2 Average Annual Long-Term Stewardship Cost FY 2000-2006 - None - Monitoring costs of remediated locations and facilities, as well as operations, maintenance and monitoring costs for treatment systems, are incorporated in the site Environmental Management budget for FY 2000-2006

Landlord - U.S. Department of Energy, Office of Science

**The estimated volume indicates only the known amounts of residual contaminants. For certain portions discussed for this site, exact volume is not known at this point. For specific discussions, please see Section 3.0.*

similarity of contaminants and contaminated media, hydrogeology, and geographic proximity. Individual remedial actions within each operable unit have been prioritized based on risk reduction in the areas of public safety and health, site personnel safety and health, and environmental protection. Nearer-term removal actions reduce risks from contaminant releases that require immediate attention and action or involve clear-cut solutions for well-defined problems. Finally, Brookhaven's pollution prevention and waste minimization strategy has limited the generation of waste materials that need to be disposed offsite. DOE is in the process of conducting remedial investigations and feasibility studies for the operable units under the CERCLA remedial action process. Three Records of Decision have been issued as of June 2000.



Brookhaven National Laboratory

The DOE Office of Environmental Management will fund the site environmental restoration activities through fiscal year 2006 (when all groundwater treatment systems are operational, all soil remediations are complete, and the Brookhaven Graphite Research Reactor is decommissioned). The Office of Environmental Management's Waste Management Program at Brookhaven transitioned to the Office of Science in 2000. The Office of Science, the site landlord, has an ongoing research mission at Brookhaven, and, according to current planning assumptions, will be responsible for long-term stewardship activities and all future land use issues. DOE anticipates that Brookhaven National Laboratory will remain under the control and ownership of the Federal government, and no land is planned to be released or transferred to the public.

Groundwater remediation and protection are the primary objectives of environmental restoration activities at the site. Groundwater contaminated with volatile organic compounds above drinking water standards occurs onsite and offsite. Public water hookups have been provided to an area south and southeast of Brookhaven to ensure that public health is protected while groundwater remediation is underway. Tritium and strontium above drinking water standards are found onsite and are planned to be addressed by a combination of active remediation and

natural attenuation.

Radiologically contaminated soils from several areas of the site will be excavated and disposed offsite. DOE established risk-based cleanup levels based on potential exposure, including such factors as potential future land use, radionuclide migration, and radioactive decay. For most of the soils, the concentration of cesium-137 determines the volume of soil to be remediated. DOE has established remediation goals that will ensure potential exposure does not exceed a dose of 15 millirem per year above background. For cesium-137, a remediation goal of 67 pCi/g has been established for soils in the area found most suitable for future industrial use (at the old Hazardous Waste Management Area) and 23 pCi/g which reflects a residential use for other areas of the site (Other Radioactive Soils and Rest of Site portions).

2.0 SITE-WIDE LONG-TERM STEWARDSHIP

2.1 Long-Term Stewardship Activities

DOE has an ongoing research mission at this site and will be responsible for all long-term stewardship activities, funding, and future land use at Brookhaven National Laboratory. Long-term stewardship activities will include operations and maintenance of the groundwater treatment systems and continued groundwater monitoring. Quarterly to annual groundwater monitoring record-keeping and reporting will be required, most likely for the next 30 to 40 years. For planning purposes, DOE estimated the end-date for groundwater monitoring and treatment to be 2034.

DOE will maintain access controls and perform surveillance and maintenance activities, as necessary. Some areas of the site, where there are landfill caps, will be restricted so as not to compromise the caps. For some areas of the site, residual contamination below cleanup levels will be monitored to ensure continued protection of human health and the environment. Administrative Records are maintained at Brookhaven National Laboratory and the EPA Region 2 Office. Information repositories are and will be integrated into the site monitoring and surveillance programs conducted by the landlord program after 2006. Monitoring data will be provided as part of the Site Environmental Reports and other reports, as required. Records will also be kept as required by the Federal Facilities Compliance Agreement.

DOE anticipates that the site's future land use will remain "industrial with restricted access" in accordance with DOE's ongoing research mission at the site.

SITE ACCOMPLISHMENTS

- Removed 10 underground storage tanks from the facility
- Capped four landfills
- Removed contaminated water from deep drain sump, fans, pile fan sump and associated contaminated soil at Brookhaven Graphite Research Reactor
- Began operation of five groundwater systems
- Excavated glass/chemical/animal pits and cesspools; waste is being disposed offsite

BY 2006 BROOKHAVEN NATIONAL LABORATORY WILL HAVE:

- Installed and begun operation of all groundwater treatment systems
- Completed all contaminated soil remediation
- Decommissioned Brookhaven Graphite Research Reactor

SITE LONG-TERM STEWARDSHIP GOALS

- Operation of groundwater extraction and treatment systems to achieve end states (State drinking water standards)
- Maintenance of institutional controls to manage residual hazards (engineered units, facilities, contaminated soil, groundwater, and surface sediments)
- Surveillance and maintenance of two decommissioned reactors

2.2 Assumptions and Uncertainties

DOE has not finalized long-term stewardship activities for several site portions pending final CERCLA Records of Decision or a determination of facility end states. For example, DOE is still developing long-term stewardship activities and requirements for the Peconic River, the Brookhaven Graphite Research Reactor, and the High Flux Beam Reactor areas of the site. Estimated costs for long-term stewardship requirements of the Brookhaven Graphite Research Reactor and Peconic River sediments are based on assumed end states following remediation.

2.3 Estimated Site-Wide Long-Term Stewardship Costs

Estimated costs for long-term stewardship activities for Brookhaven National Laboratory are identified in the table below. DOE estimates long-term surveillance and monitoring costs to average approximately \$2 million per year. Since planning is in its earliest stages, however, the estimated costs provided in the tables do not include long-term stewardship costs for the High Flux Beam Reactor, which was transferred from the DOE Office of Science to the DOE Office of Environmental Management in April 2000. Estimated costs for the Brookhaven Graphite Research Reactor are included for beyond FY 2006, and are based on DOE's Office of Environmental Management's current planning for decommissioning this facility. Costs for long-term stewardship activities for the former Hazardous Waste Management Facility are included in the estimates for the Landfills portion of the site. Costs for the transfer of long-term stewardship responsibilities for the Landfills portion in 2003, are included in the overall DOE Environmental Management budget but have not been specified as long-term stewardship costs for purposes of this report.

STAKEHOLDER INVOLVEMENT

Local communities and the public are afforded opportunities to provide input to long-term stewardship issues through the CERCLA decision process and associated Records of Decision. Public comment periods and meetings are held on cleanup projects, and responses to the public's comments are provided in the Responsiveness Summary sections of the Records of Decision. Input is also sought from the Brookhaven Executive Roundtable, an organization of local elected officials and regulatory agencies, and the Brookhaven National Laboratory Community Advisory Council.

<i>Site Long-Term Stewardship Costs (Constant Year 2000 Dollars)</i>					
<i>Year(s)</i>	<i>Amount</i>	<i>Year(s)</i>	<i>Amount</i>	<i>Year(s)</i>	<i>Amount</i>
FY 2000	\$0	FY 2008	\$4,435,065	FY 2036-2040	TBD
FY 2001	\$0	FY 2009	\$4,026,333	FY 2041-2045	TBD
FY 2002	\$0	FY 2010	\$3,344,847	FY 2046-2050	TBD
FY 2003	\$0	FY 2011-2015	\$12,480,033	FY 2051-2055	TBD
FY 2004	\$0	FY 2016-2020	\$9,810,085	FY 2056-2060	TBD
FY 2005	\$0	FY 2021-2025	\$7,639,066	FY 2061-2065	TBD
FY 2006	\$0	FY 2026-2030	\$6,591,431	FY 2066-2070	TBD
FY 2007	\$4,793,967	FY 2031-2035	\$3,554,048		

3.0 PORTION OVERVIEW

Brookhaven National Laboratory is managed by operable units. For purposes of this report, the site has been

subdivided into seven portions to allow for a more precise discussion of the geographic locations of long-term stewardship activities at the site at the end of 2007. For the purposes of this report, a “portion” is defined as a geographically contiguous and distinct area (which may involve residually contaminated facilities, engineered units, soil, groundwater, and/or surface water/sediment) for which cleanup, disposal, or stabilization will have been completed and long-term stewardship activities will be required as of 2007. The Brookhaven National Laboratory site consists of seven portions: (1) BGRR/HFBR decontamination and decommissioning, (2) Groundwater (OU-III, primarily, and OU-VI), (3) Former HWMF (OU-I), (4) Other Radioactive Soils (OU-I), (5) Landfills (OU-I), (6) Rest of Site (OU-I), and (7) Peconic River (OU-V).

Some of the geographic areas of the Brookhaven National Laboratory site are not represented as portions. These include areas of the site that have an ongoing mission and for which long-term stewardship activities will not be required, as well as areas where remediation activities will not be complete or where stabilization will not occur within the FY 2006 time frame specified by the *National Defense Authorization Act for Fiscal Year 2000* (FY 2000 NDAA) language. Brookhaven National Laboratory states that, with the exception of the High Flux Beam Reactor, which was accepted in the DOE Office of Environmental Management Program in April 2000, all currently baselined site remediation activities and decontamination and decommissioning activities are to be completed by the end of 2006; therefore there are no areas of the site for which remediation will be ongoing as of the end of 2006. Only two portions of the Brookhaven National Laboratory site, the BGRR/HFBR decontamination and decommissioning portion and Landfills portion, will require long-term stewardship activities prior to 2006. The other portions of the site, including Groundwater, Former Hazardous Waste Management Facility, Other Radioactive Soils, Peconic River, and Rest of Site will require some long-term stewardship activities starting in 2007. DOE anticipates that decontamination and decommissioning and site remediation activities for the site portions other than the HFBR decontamination and decommissioning are anticipated to be completed by the end of 2006.

The remaining sections discuss “portions” of the Brookhaven National Laboratory site that will require long-term stewardship activities by 2007. Each portion is identified in the text and table below, with a more detailed discussion of cleanup and long-term stewardship activities in Sections 3.1 through 3.7.

- The 0.8 hectare (1.9-acre) **BGRR/HFBR Decontamination and Decommissioning (D&D)** portion includes the Brookhaven Graphite Research Reactor and the High Flux Beam Reactor, which are being decontaminated and decommissioned. The BGRR and the HFBR are identified as a separate site portion because they are similar facilities, e.g., reactors with undetermined end states. Groundwater contamination from these facilities is discussed separately in the Groundwater portion below.
- The 2,630-hectare (6,500-acre) **Groundwater** portion of the site consists of contaminated groundwater underlying Brookhaven National Laboratory site areas and offsite areas. (Contaminated groundwater included in this site portion may underlie other site portions). All of the groundwater has been aggregated into a single site portion because they have similar remedial objectives and long-term stewardship requirements.
- The 7.3-hectare (18-acre) **Landfills** portion of the site consists of the Current Landfill, the Former Landfill Area (Former Landfill, Slit Trench and Interim Landfill) and the Ash Pit. These landfill areas are grouped together into a single portion because they are similar in construction (i.e. contain buried waste) and have similar long-term monitoring and institutional control requirements.
- The 4.8-hectare (12-acre) **Former Hazardous Waste Management Facility (HWMF)** portion of the site has been singled out as a separate portion because it has unique long-term stewardship requirements and cleanup levels associated with radiologically contaminated soils that are different from the other soil portions at Brookhaven National Laboratory.

- This 0.8-hectare (two-acre) **Other Radioactive Soils** portion of the site consists of scattered areas of soil contaminated with radionuclides, primarily cesium-137 and strontium-90. Most of this soil is shallow, i.e. the top 0.3-0.6 meter (one-two feet), though contamination is as deep as 7.6 meters (25 feet) in several areas. One area is also contaminated with lead. These areas have been singled out as a separate portion because they have different long-term stewardship requirements and cleanup levels than other portions.
- The 0.8-hectare (two-acre) **Rest of Site** portion of the Brookhaven National Laboratory site includes those Areas of Concern identified through the Remedial Investigation/ Feasibility Study process for the site. These areas are included in the site Environmental Restoration program, have minimal long-term stewardship requirements, and are not included in the other site portions.
- The four-hectare (ten-acre) **Peconic River** site portion include areas of the Peconic River and sources of contamination, including the Sewage Treatment Plant, the Satellite Disposal Area, and a portion of the site sewer system. The Peconic River portion is included as a separate site portion because it is a geographically distinct area under the Operable Unit V CERCLA program.

<i>Long-Term Stewardship Information</i>		
<i>Portion Name and Location</i>	<i>Long-Term Stewardship Start Year</i>	<i>Long-Term Stewardship End Year</i>
BGRR/HFBR Decontamination and Decommissioning*	2006**	2050***
Groundwater (OU-III, primarily, and OU-VI)	2007	2034
Former HWMF (OU-I)	2007	2034
Other Radioactive Soils (OU-I)	2007	2034
Landfills (OU-I)	2003	2034****
Rest of Site (OU-I)	2007	2034
Peconic River (OU-V)	2007	2009

* Assumes start of long-term stewardship for BGRR only; schedule for HFBR is under development.

** Monitoring costs of remediated locations and facilities, as well as operations, maintenance and monitoring costs for treatment systems, are incorporated in the site Environmental Management budget for FY 2000-2006.

*** Assumption from BGRR Removal Action Alternatives Study; plans not developed past 2050.

**** Plans not developed past 2034.

3.1 Brookhaven Graphite Research Reactor and High Flux Beam Reactor Decontamination and Decommissioning

The 0.77 hectare (1.9 acre) Brookhaven Graphite Research Reactor and the High Flux Beam Reactor are similar reactor facilities with undetermined end states. The end state for the Brookhaven Graphite Research Reactor is being decided in collaboration with regulators and stakeholders. An assumed end state for planning purposes includes major removal actions for all contaminated structures, appurtenances, and contaminated soil, with the reactor core (702 Building) sealed and left in place and the containment/operations building (701 Building) left intact for other laboratory re-use options. A Removal Action Alternatives Study was issued for public review and comment in January 2000. This study recommends a further evaluation of a short list of alternatives in an Engineering Evaluation/Cost Analysis document. At the conclusion of Removal Actions under CERCLA, a Record of Decision will be published in 2004 or early 2005.

Portion-wide long-term stewardship activities are expected to begin in 2006 and will continue as long as the reactor pile remains, based on information to date. Institutional controls will include access restrictions and a surveillance and maintenance program. Engineered controls for the Brookhaven Graphite Research Reactor include sealing the reactor's biological shield wall and isolating the below-grade ducts, maintaining the 701 Building as the primary barrier, and conducting long-term surveillance and maintenance of the facility. Groundwater wells surrounding the Brookhaven Graphite Research Reactor facility will be monitored to ensure that there is no contamination migration to the underlying aquifer. Surveillance and maintenance activities include radiological monitoring of the reactor facility (reactor pile) and routine maintenance, such as periodic roof repairs and painting of Building 701.

***BROOKHAVEN GRAPHITE RESEARCH
REACTOR AND HIGH FLUX BEAM REACTOR
DECONTAMINATION AND
DECOMMISSIONING HIGHLIGHTS***

Major Long-Term Stewardship Activities - end state and long-term stewardship activities have not been finalized for this site portion

Portion Size - 0.77 hectares (1.9 acres)

Estimated Volume of Residual Contaminants - facilities and soil unknown

Long-Term Stewardship Start-End Years - 2006-2050

Average Annual Long-Term Stewardship Costs FY 2000-2006 - None - Monitoring costs of remediated locations and facilities, as well as operations, maintenance and monitoring costs for treatment systems, are incorporated in the site Environmental Management budget for FY 2000-2006

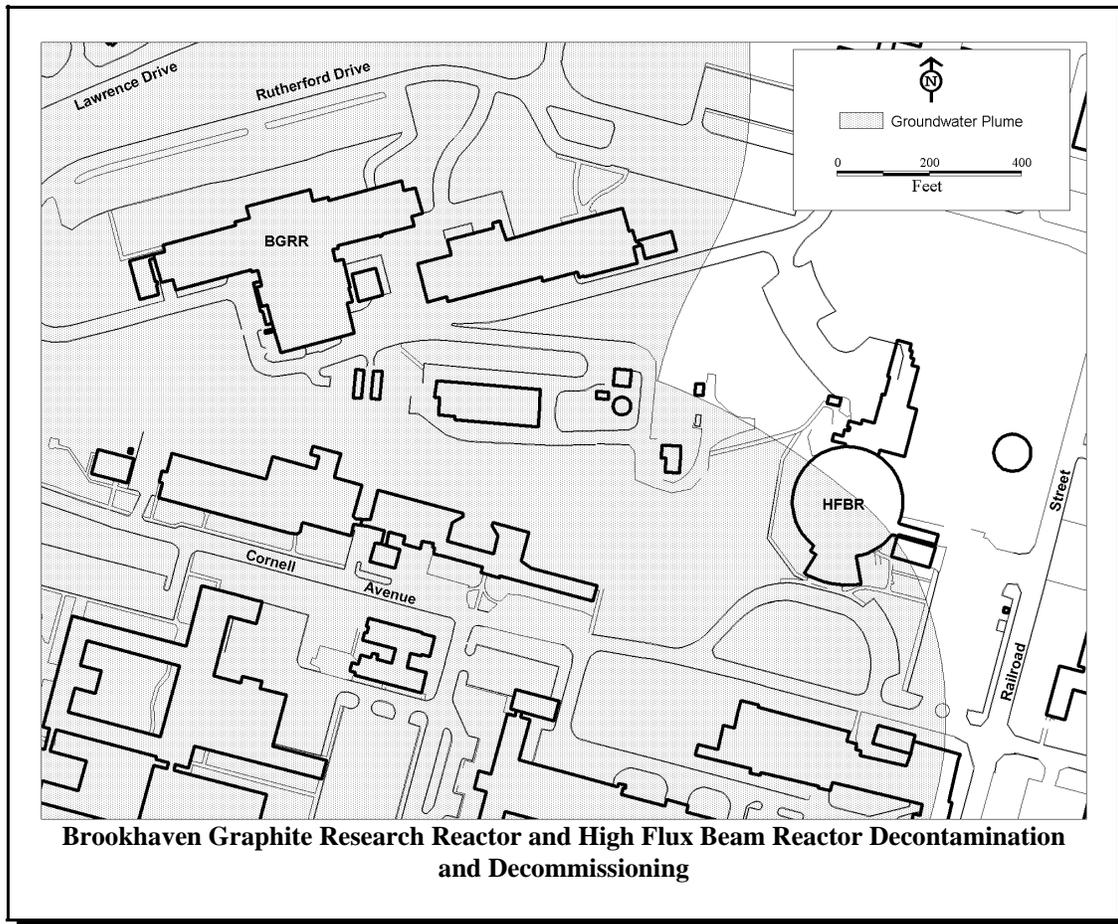
The High Flux Beam Reactor was permanently shut down in 1999. In April 2000, responsibility for the High Flux Beam Reactor was transferred from the DOE Office of Science to the DOE Office of Environmental Management. The end state for the High Flux Beam Reactor has not been determined at this time. Anticipated engineered controls for the High Flux Beam Reactor include maintaining the integrity of the confinement building during post decommissioning and long-term surveillance and maintenance, as needed. The groundwater contamination from these facilities is covered under the Groundwater portion (Section 3.2) that addresses all groundwater at Brookhaven National Laboratory (which has similar remedial objectives and long-term stewardship).

3.1.1 Facilities

The reactor structures and components present a unique facility media. Major reactor operational and structural components consist of concrete, steel, lead shielding, piping systems, electrical distribution systems, heating ventilation and air conditioning systems, and reactor control systems. Many of these components are contaminated radiologically and/or contain hazardous materials, including asbestos, mercury, polychlorinated biphenyls. The two reactor facilities encompass 0.8 hectare (1.9 acres.)

The residual contamination in the facilities consists of mixed fission products (cesium-137 and strontium-90); failed fuel residue in the BGRR (plutonium, uranium, and americium); induced radioactivity from reactor operations (carbon-14, iron-55, cobalt-60); and hazardous material in facility and reactor components containing lead, asbestos, and polychlorinated biphenyls. Since DOE has not fully characterized either the BGRR or the HFBR, the volume of contamination is unknown at this time. Characterization of the BGRR is underway.

Decontamination and decommissioning and long-term stewardship activities on the former reactors in this site portion are being conducted pursuant to Brookhaven's Standards Based Management System, all applicable Federal and State requirements, and applicable DOE Orders. Remediation of contaminated soils and groundwater at Brookhaven National Laboratory is being conducted in accordance with the Federal Facilities Compliance Agreement signed in 1992 by DOE, the U.S. Environmental Protection Agency, and the New York State Department of Environmental Conservation. The BGRR also is an Area of Concern identified in the Federal Facilities Compliance Agreement.



Facilities Long-Term Stewardship Activities

Long-term stewardship activities for the decontaminated and decommissioned reactors will include access controls and surveillance and maintenance for the Brookhaven Graphite Research Reactor and Building 701. Long-term stewardship plans for the High Flux Beam Reactor site have not yet been developed.

3.1.2 Soil

DOE is completing soil cleanup within one of the removal actions in accordance with CERCLA. DOE already has removed some of this soil. During the Brookhaven Graphite Research Reactor's operational and post-shutdown period, contaminated water leaked into the soil column under major reactor structures (fuel canal, below-grade ducts, surface soil, pile fan sump), resulting in soil contamination that must be remediated. The reactor's operational history indicates that the fuel canal leaked during operation and intrusion water was discovered inside the underground ducts. Fuel casks were decontaminated outside the fuel storage canal, resulting in surface soil contamination (which has subsequently been paved over). DOE has not characterized the remaining contaminated soil and, as a result, has not determined the depth and volume of contamination. The residual contamination in the soil consists of fission products (cesium-137 and strontium-90), uranium, plutonium, and americium.

Soils Long-Term Stewardship Activities

The extent of contamination and planned cleanup levels have not yet been determined.

3.1.3 Estimated Long-Term Stewardship Costs for BGRR and HFBR D&D

DOE has only included estimated long-term stewardship costs for the BGRR, and these costs are based on DOE's Environmental Management's current planning for decommissioning this facility. The costs included surveillance and monitoring activities, such as radiological monitoring of the reactor facility, and routine maintenance, such as periodic roof repairs. DOE will monitor the BGRR facility to ensure that there is no contamination migrating to the underlying aquifer.

<i>Long-Term Stewardship Costs (Constant Year 2000 Dollars)*</i>							
<i>FY 2000 - FY 2010</i>	<i>FY 2011 - FY 2020</i>	<i>FY 2021 - FY 2030</i>	<i>FY 2031 - FY 2040</i>	<i>FY 2041 - FY 2050</i>	<i>FY 2051 - FY 2060</i>	<i>FY 2061 - FY 2070</i>	<i>Estimated Total</i>
\$2,000,000	\$5,000,000	\$5,000,000	\$5,000,000	\$5,000,000	TBD	TBD	\$22,000,000

* Only costs for BGRR are included.

3.2 Groundwater

This 2,630 hectare (6,500-acre) portion addresses all groundwater plumes at Brookhaven National Laboratory, including both onsite and offsite groundwater contamination, which have similar remedial objectives and similar long-term stewardship requirements. The groundwater plumes include both onsite and offsite plumes. In general, the direction of groundwater flow is south. Since Brookhaven National Laboratory is just south of Long Island's groundwater divide, the plumes tend to descend in depth as they move south. Several volatile organic compound groundwater plumes have moved offsite but a 1996 private well sampling program conducted by the Suffolk County Department of Health confirmed DOE information that the plumes were generally deeper than private wells in the area. However, DOE provided public water to offsite areas as a precautionary measure.

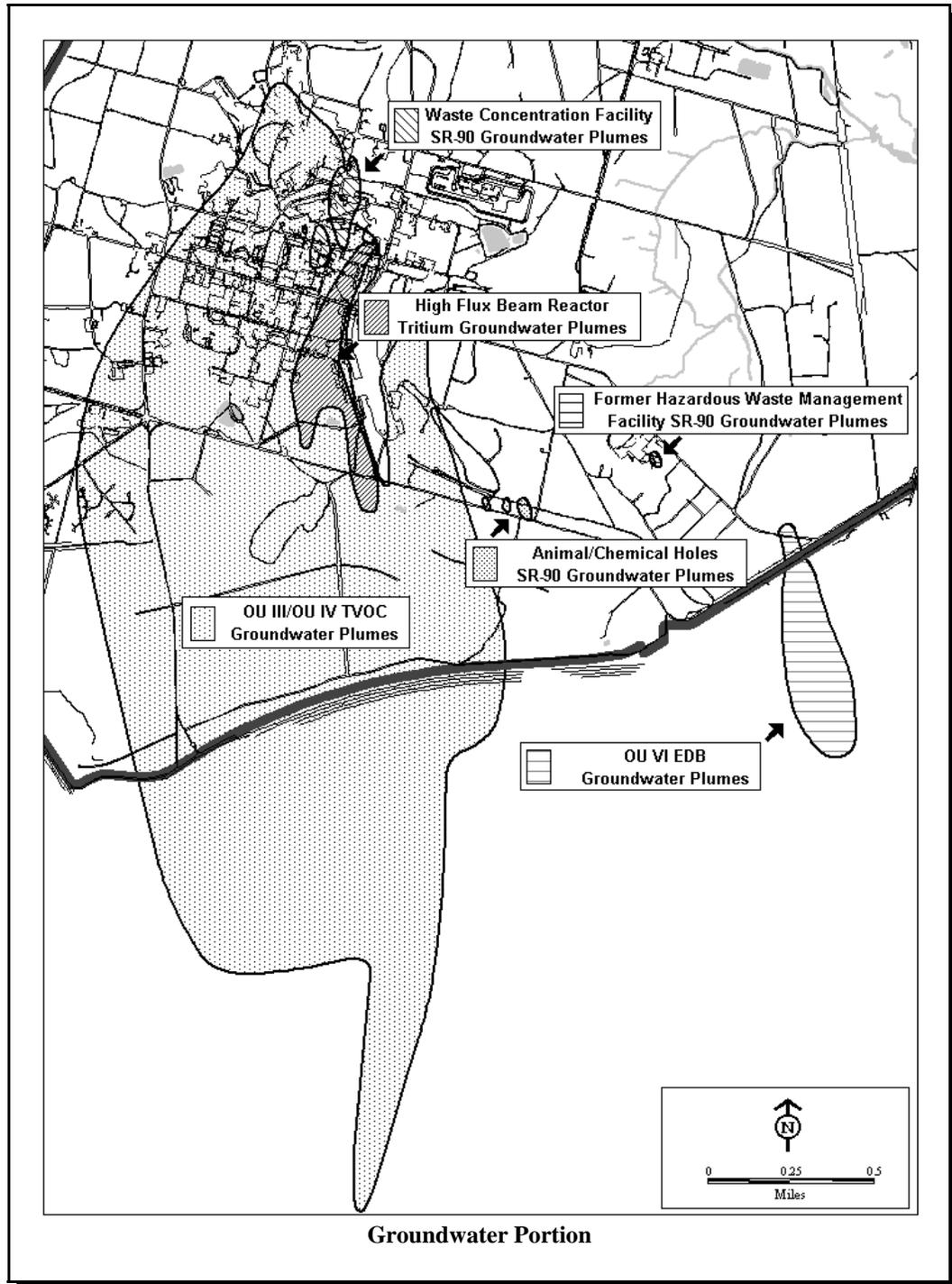
GROUNDWATER HIGHLIGHTS

Major Long-Term Stewardship Activities - operation of groundwater extraction and treatment systems; groundwater monitoring,
Portion Size - 2,630 hectares (6,500 acres) including onsite and offsite areas of contaminated groundwater
Estimated Volume of Residual Contaminants - groundwater unknown
Long-Term Stewardship Start-End Years - 2007-2034
Average Annual Long-Term Stewardship Costs FY 2000-2006 - None - Monitoring costs of remediated locations and facilities, as well as operations, maintenance and monitoring costs for treatment systems, are incorporated in the site Environmental Management budget for FY 2000-2006

The Brookhaven National Laboratory site also has several onsite strontium-90 and tritium groundwater plumes at concentrations greater than drinking water standards. Levels of tritium less than the drinking water standard have been found off the Brookhaven National Laboratory site in some areas.

Portion-wide long-term stewardship activities are scheduled to begin in 2007 and estimated to end in 2034. Additional scope may be added to the management and remediation of this portion upon completion of negotiations between EPA and the New York State Department of Environmental Conservation on two Records of Decision which impact this portion. Design activities are underway since the finalization of the Operable Unit III Record of Decision in June 2000, and several of the required groundwater treatment systems have already been constructed. Operable Unit III contains most of the site's contaminated groundwater. DOE will restrict the installation of potable wells in contaminated areas onsite to ensure that Brookhaven National Laboratory workers do not consume contaminated groundwater. Brookhaven National Laboratory's potable water is monitored in accordance with New York State Health Department requirements. Brookhaven National Laboratory will also restrict the installation of process supply wells and groundwater discharges in areas that will adversely impact management of the various plumes.

For the offsite volatile organic compound plumes, DOE provided public water to areas offsite potentially impacted by the plumes. Public water supplies are managed in accordance with Federal Safe Drinking Water Act standards implemented by the Suffolk County Department of Health Services. New construction in these areas would have to connect to public water mains in accordance with Suffolk County building codes. For those residents who have not connected to the public water system, DOE will provide free private well sampling through the Suffolk County Department of Health Services and will continue to recommend that residents get their wells sampled. Institutional control activities are and will continue to be required as part of the groundwater



remedies in the Records of Decision for Operable Unit III, Operable Unit V, and Operable Unit VI. The continued effectiveness of these institutional controls will also be evaluated as part of the 5-year reviews required by CERCLA.

The site groundwater protection program has been established in accordance with the requirements of DOE Order 5400.1, *General Environmental Protection Program*. Remediation of groundwater at the Brookhaven National Laboratory site and offsite areas and groundwater long-term stewardship activities (ongoing groundwater extraction, treatment, and monitoring) is being conducted by the Laboratory Environmental Restoration Program in accordance with milestones established in the Federal Facilities Compliance Agreement and under Federal regulations in 40 CFR Parts 300, 302, 355, and 370. Safe Drinking Water Act implementation is administered in Suffolk County by the Suffolk County Department of Health Services. Operation of groundwater extraction and treatment systems at the site is being conducted in accordance with the provisions of the 1992 Federal Facilities Compliance Agreement.

Groundwater Long-Term Stewardship Activities

Groundwater extraction, treatment, and monitoring will continue until the drinking water standards are achieved in the aquifer, which is estimated to be in 30 years. By the end of 2006, all groundwater treatment systems will be operational and environmental monitoring will be underway. Long term stewardship activities will include operation and maintenance of the groundwater extraction and treatment systems. DOE anticipates that groundwater monitoring and treatment will be required for the next 25 to 30 years following startup of the remaining planned treatment systems. Groundwater extraction, treatment, and monitoring are planned to be conducted until the groundwater meets state drinking water standards. The estimated end date for groundwater monitoring, extraction, and treatment is FY 2034. No stewardship activities will be required after drinking water standards are established for the groundwater. The primary risk pathway is the potential consumption of groundwater containing contaminant concentrations above drinking water standards. The primary contaminants are volatile organic compounds, strontium-90, and tritium. The target cleanup standards are the drinking water standards (i.e., 5 ug/L for volatile organic compounds, 8 pCi/L for strontium-90, and 20,000 pCi/L for tritium).

3.2.1 Estimated Long-Term Stewardship Costs for Groundwater

<i>Long-Term Stewardship Costs (Constant Year 2000 Dollars)</i>							
<i>FY 2000 - FY 2010</i>	<i>FY 2011 - FY 2020</i>	<i>FY 2021 - FY 2030</i>	<i>FY 2031 - FY 2040</i>	<i>FY 2041 - FY 2050</i>	<i>FY 2051 - FY 2060</i>	<i>FY 2061 - FY 2070</i>	<i>Estimated Total</i>
\$13,537,802	\$16,521,518	\$8,461,897	\$746,608	\$0	\$0	\$0	\$39,267,825

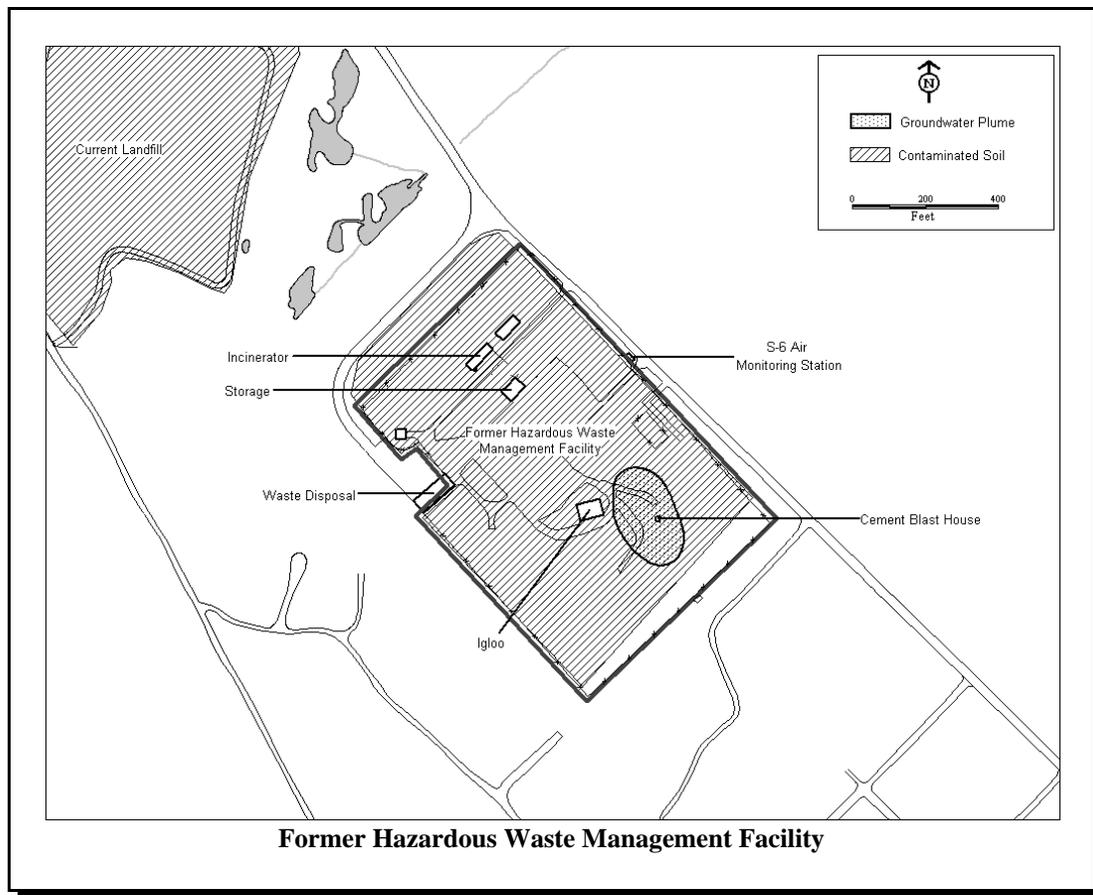
3.3 Former Hazardous Waste Management Facility

The Former Hazardous Waste Management Facility is a 4.8-hectare (12-acre) facility that is defined as a separate portion because it has unique long-term stewardship requirements and cleanup levels. The property is owned by DOE and is planned to remain part of Brookhaven National Laboratory. Future uses will be evaluated and restricted so that future users will not be exposed to unacceptable levels of contaminants. Appropriate deed restrictions would be put in place of

<p>FORMER HAZARDOUS WASTE MANAGEMENT FACILITY HIGHLIGHTS</p> <p><i>Major Long-Term Stewardship Activities</i> - access restrictions and other institutional controls</p> <p><i>Portion Size</i> - 4.8 hectares (12 acres)</p> <p><i>Estimated Volume of Residual Contaminants</i> - soil unknown</p> <p><i>Long-Term Stewardship Start-End Years</i> - 2007-2034</p> <p><i>Average Annual Long-Term Stewardship Costs FY 2000-2006</i> - included in the Landfills Portion costs</p>

the property were to be transferred from DOE. There are no engineered controls at this site, and the costs for long-term stewardship activities are included in the Landfills portion. Design activities are underway based on the final remedy for this portion, as agreed upon by EPA and the New York State Department of Environmental Conservation in the Operable Unit I Record of Decision, which was finalized in Fall 1999. The selection remedy involves large-scale excavation and disposal of contaminated soil.

Closure and remediation of the former hazardous waste management facility and any post closure long-term stewardship activities are being conducted in accordance with the Federal Facilities Compliance Agreement.



3.3.1 Soil

The Former Hazardous Waste Management Facility is currently a fenced 12-acre area with controlled access. Operations in the facility ended in 1997. All remaining wastes and buildings will be removed prior to soil remediation. The selected remedy is large-scale soil excavation and offsite disposal. This portion of the site will be remediated to industrial cleanup goals. Following 50 years of institutional controls, the land could be available for industrial use.

Soils Long-Term Stewardship Activities

Post-remediation residual contamination will consist of levels of cesium-137, strontium-90 and lead below cleanup levels. Residual contamination below cleanup levels for unrestricted use will be monitored, and future uses of the site will be reviewed so that any activities performed would not cause unacceptable exposure to residual contamination.

3.3.2 Estimated Long-Term Stewardship Costs for the Former Hazardous Waste Management Facility

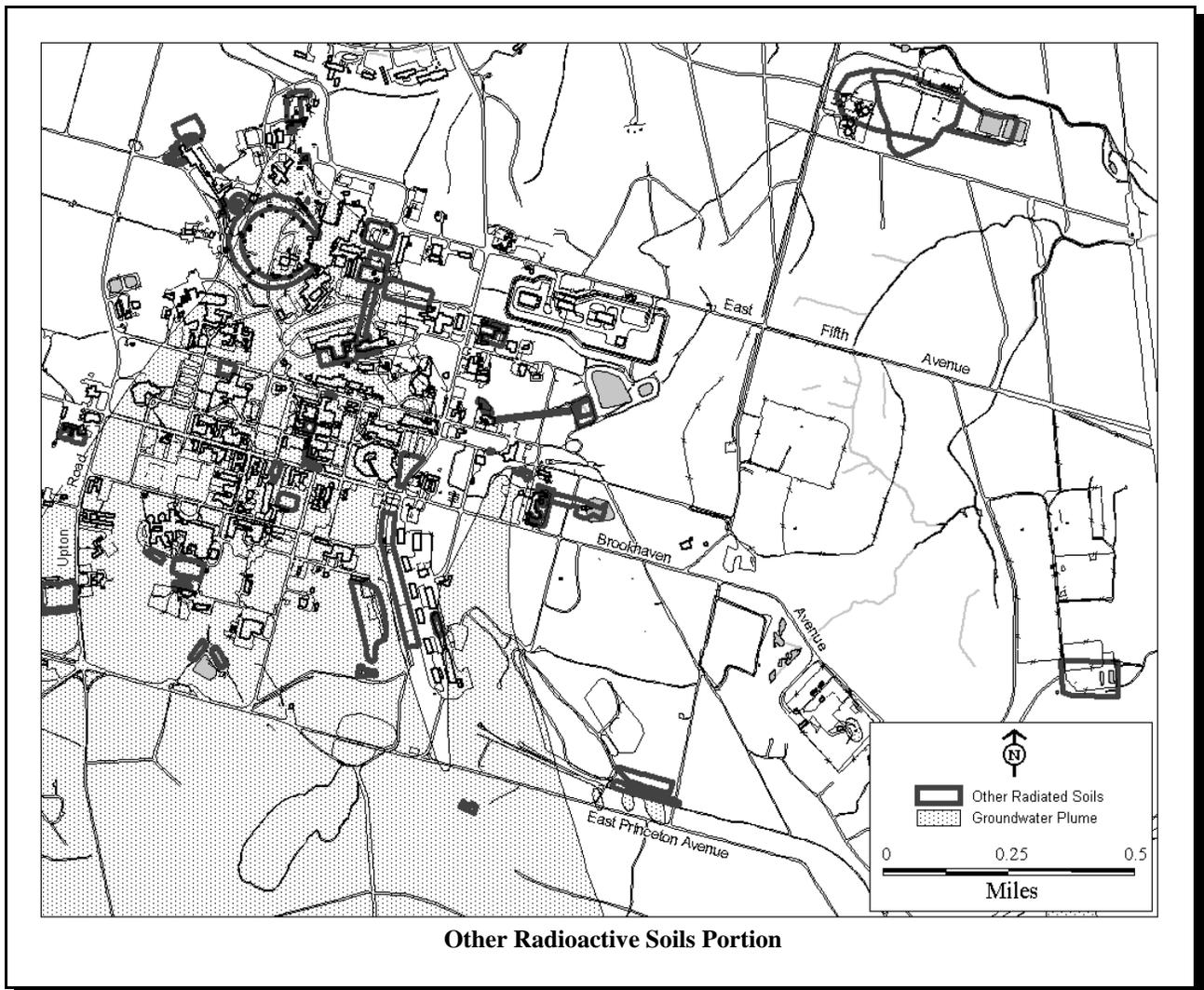
Costs for limited long-term stewardship activities at the Former Hazardous Waste Management Facility are included with the Landfills portion.

3.4 Other Radioactive Soils

The Other Radioactive Soils account for 0.8 hectare (two acres) of the site and are defined as a separate portion because they have unique long-term stewardship requirements and cleanup levels. These soils are contaminated with radionuclides, primarily cesium-137 and strontium-90. Most of this soil is shallow, i.e., the top 0.3-0.6 meter (one-two feet), though contamination may be as deep as 7.6 meters (25 feet) in several areas. One area is also contaminated with lead.

OTHER RADIOACTIVE SOILS HIGHLIGHTS

Major Long-Term Stewardship Activities - maintenance of future use and deed restrictions
Portion Size - 0.8 hectare (2 acres)
Estimated Volume of Residual Contaminants - soil 1,911 cubic meters (2,500 cubic yards)
Long-Term Stewardship Start-End Years - 2007-2034
Average Annual Long-Term Stewardship Costs FY 2000-2006 - included in the Landfill Portion costs



A Record of Decision has been finalized for these areas. Remediation of the landscaping soils began in Spring 2000 and will be completed this year. Design activities are currently underway for the remainder of the areas in this portion. Post remediation contamination will consist of levels of cesium-137, strontium-90 and lead below cleanup levels but above background levels. The estimated volume of post-cleanup contamination is estimated to be up to 1,911 cubic meters (2,500 cubic yards.)

The property is owned by DOE and will remain part of Brookhaven National Laboratory. Future uses will be evaluated and restricted so that the levels of contaminants will not exceed above regulatory limits. Appropriate deed restrictions will be put in place if the property is transferred from DOE. There are no engineered controls at this site and the costs for long-term stewardship activities are included in the Landfills portion of the site.

Soils Long-Term Stewardship Activities

A Record of Decision has been finalized for the Other Radioactive Soil portion areas. Remediation of the landscaping soils began in spring 2000. Design activities are underway for the remainder of the areas in this portion. Long-term stewardship activities would include primarily institutional controls, with periodic radiation surveys.

3.4.1 Estimated Long-Term Stewardship Costs for the Other Radioactive Soils

Costs for this portion are included in the Landfills portion costs.

3.5 Landfills

The Landfills portion is seven hectares (18 acres) and consists of five landfills – the Current Landfill, the Former Landfill Area (including the Former Landfill, Slit Trench, and Interim Landfill), and the Ash Pit. These areas are grouped together into a single site portion because they are similar in construction, contain buried waste, and have similar requirements for long-term monitoring and institutional control. A Record of Decision has been signed that specifies the required remediation and long-term stewardship actions for these sites.

These sites are owned by DOE and will remain part of Brookhaven National Laboratory. Portion-wide long-term stewardship activities are included in the DOE Environmental Management budget through FY 2006 and are not included here. Long-term stewardship costs have been estimated through FY 2034. Some level of effort is expected after this, but it has not been estimated.

LANDFILLS HIGHLIGHTS

Major Long-Term Stewardship Activities - long-term surveillance and maintenance of engineered units, access restrictions and other institutional controls

Portion Size - 7 hectares (18 acres)

Estimated Volume of Residual Contaminants - engineered units unknown

Long-Term Stewardship Start-End Years - 2003-2034

Average Annual Long-Term Stewardship Costs FY 2000-2006 - None. Monitoring costs of remediated locations and facilities, as well as operations, maintenance and monitoring costs for treatment systems, are incorporated in the site Environmental Management budget for FY 2000-2006.

3.5.1 Engineered Units

This medium comprises all of the buried waste at Brookhaven National Laboratory (i.e., the five landfills). Remediation and monitoring activities for these engineered units are discussed below.

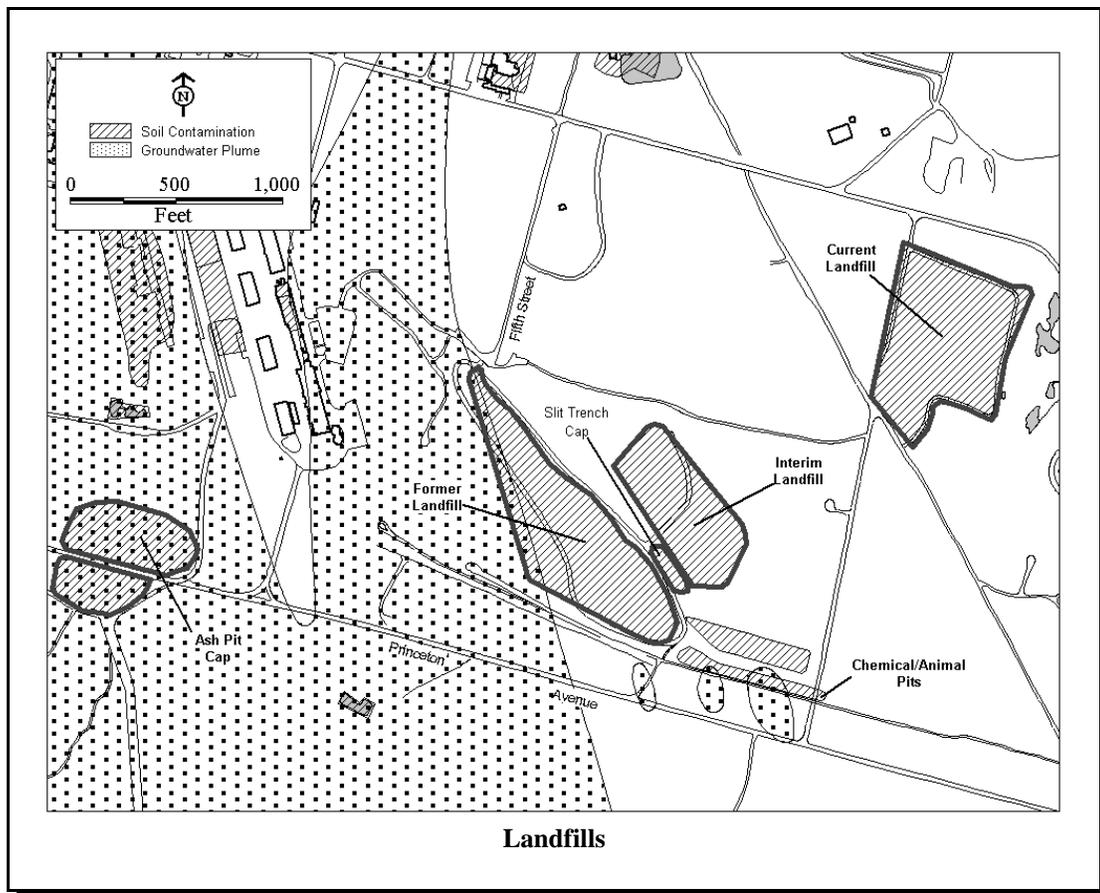
The Current and Former Landfills (each about three hectares [eight acres]) contain primarily municipal/sanitary type wastes, as well as residual chemical and low-level radioactive wastes (i.e., mouse litter, sewage treatment plant sludge). The Current Landfill and subportions of the Former Landfill Area (i.e., Former Landfill, Slit

Trench, and Interim Landfill) were closed with a multi-layer geomembrane and soil cap, in accordance with the New York State Department of Environmental Conservation's Solid Waste Management Facility requirements (6NYCRR Part 360, also known as the "Long Island Landfill Law"). Other components of the engineered units were constructed in accordance with the 6NYCRR Part 360. Buried wastes from the Chemical/Animal Pits and Glass Holes were excavated and are being disposed offsite. A long-term environmental monitoring system, including groundwater and landfill gas, is in place and is being conducted in accordance with the post-closure operating and maintenance requirements specified in 6NYCRR Part 360.

The Ash Pit, encompassing about three acres, contains incinerator ash that was placed in the pit between 1943 and 1963. The Ash Pit will be covered with a 15-centimeter (six-inch) soil cap, in accordance with EPA guidance for lead-contaminated soil. The purpose of the cap is to restrict potential exposure to heavy metals (e.g., lead) in the exposed ash.

Engineered Units Long-Term Stewardship Activities

Inactive landfills at the site have been capped in accordance with New York State Department of Environmental Conservation requirements. Long-term maintenance of the landfill caps and environmental monitoring (e.g. soil gas and groundwater) will be conducted throughout the landfill post closure period. Future activities at the former landfill sites will be restricted so that the caps are not compromised. Quarterly to annual groundwater monitoring, record-keeping and reporting will be required for the former landfill sites. DOE anticipates that these activities will be required for the next 30 to 40 years at a minimum. The current estimated end date for long-term stewardship activities for the Former landfill sites is 2034, though some level of effort is expected after that. The ashfill will be covered with a soil cap. The soil cap will be maintained and future activities at the site will be restricted.



3.5.2 Estimated Long-Term Stewardship Costs for the Landfills

Costs are based on methane monitoring, groundwater sampling and monthly inspections for the Current and Former landfill, and annual visual inspections of the Ash Pit. Costs for implementing the required monitoring and maintenance activities for the capped landfills are well understood because DOE has performed these activities for several years. Monitoring costs of remediated locations and facilities, as well as operations, maintenance and monitoring costs for treatment systems, are incorporated in the site Environmental Management budget for FY 2000-2006. Costs for long-term stewardship activities for the former Hazardous Waste Management Facility are included in the estimates for the Landfills portion of the site. Costs for the transfer of long-term stewardship responsibilities for the Landfills portion in 2003, are included in the overall DOE Environmental Management budget but have not been specified as long-term stewardship costs for purposes of this report.

<i>Long-Term Stewardship Costs (Constant Year 2000 Dollars)</i>							
<i>FY 2000 - FY 2010</i>	<i>FY 2011 - FY 2020</i>	<i>FY 2021 - FY 2030</i>	<i>FY 2031 - FY 2040</i>	<i>FY 2041 - FY 2050</i>	<i>FY 2051 - FY 2060</i>	<i>FY 2061 - FY 2070</i>	<i>Estimated Total</i>
\$615,080	\$768,600	\$768,600	\$307,440	TBD	TBD	TBD	\$2,459,720

3.6 Rest of Site

The final Records of Decision have been signed with EPA and the New York State Department of Environmental Conservation for these areas. The Rest of Site portion is 0.8 hectare (two acres) and includes those Areas of Concern that are in the Laboratory Environmental Restoration program, have long-term stewardship requirements, and are not included in the other portions. Any groundwater contamination underlying these Areas of Concern is not included in the Rest of Site portion, but is included in the groundwater site portion. Areas of Concern that include radioactive soil contamination are addressed in other site portions, and are not included in the Rest of Site portion.

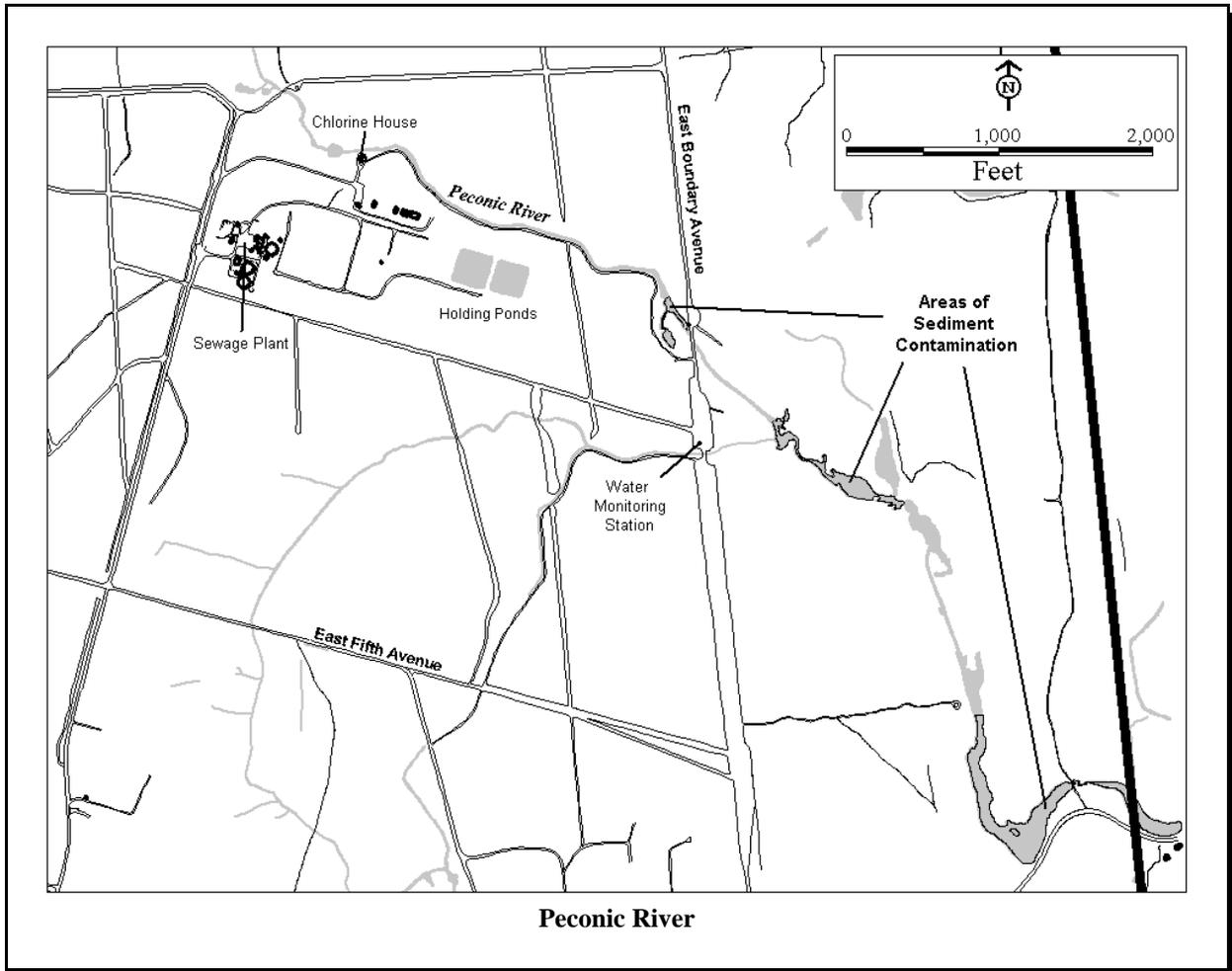
<i>REST OF SITE HIGHLIGHTS</i>
<i>Major Long-Term Stewardship Activities</i> - not yet specified - future use and deed restrictions, however Record of Decision is not yet finalized
<i>Portion Size</i> - 0.8 hectare (2 acres)
<i>Estimated Volume of Residual Contaminants</i> - groundwater unknown
<i>Long-Term Stewardship Start-End Years</i> - 2007-2034
<i>Average Annual Long-Term Stewardship Costs FY 2000-2006</i> - included in the Groundwater portion costs

3.6.1 Soil

This portion consists of 0.8 hectare (two acres) of mostly surface soil contaminated with a variety of industrial facility contaminants. Radioactively contaminated soil is addressed in other site portions. The areas have been characterized via the Remedial Investigation/Feasibility Study process, and Records of Decision have been issued. The residual contamination is below levels that pose a concern for public health, and the volume of residual contamination is unknown.

Soil Long-Term Stewardship Activities

The property is owned by DOE and will remain part of Brookhaven National Laboratory. Future uses will be evaluated and restricted, as appropriate, so that future users will not be exposed to levels of contaminants above regulatory levels. Appropriate deed restrictions will be put in place if the property is transferred from DOE. In general, these Areas of Concern have been remediated to levels that can be free released, and costs for long-term



stewardship activities are minimal. Costs and requirements for groundwater monitoring associated with Areas of Concern included in this portion of the site are discussed above under the Groundwater portion of the site.

3.6.2 Estimated Long-Term Stewardship Costs for Rest of Site

Costs for this portion are included in the Groundwater portion costs in Section 3.2.

3.7 Peconic River

The Peconic River portion is a four-hectare (ten-acre) geographically distinct area under the Operable Unit V CERCLA program. The final cleanup remedy for contamination in the Peconic River and required long-term stewardship activities have not yet been determined. However, DOE currently assumes that portion-wide long-term stewardship activities will begin in 2007 and end in 2009.

<i>PECONIC RIVER HIGHLIGHTS</i>
<i>Major Long-Term Stewardship Activities</i> - monitoring of residually contaminated sediment
<i>Portion Size</i> - 4 hectares (10 acres)
<i>Estimated Volume of Residual Contaminants</i> - surface water/sediment - unknown
<i>Long-Term Stewardship Start-End Years</i> - 2007-2009
<i>Average Annual Long-Term Stewardship Costs FY 2000-2006</i> - n/a (cost begin FY 2007)

3.7.1 Surface Water/Sediment

Sediment in the Peconic River, located from the discharge point of Brookhaven National Laboratory's sewage treatment plant to just beyond the site's eastern boundary, have been impacted due to historical discharges. The contaminated fine grained sediments have accumulated mainly within the top six inches of the depositional areas of the river. The final remedy for the Peconic River has not yet been made and will be contained in the Operable Unit V Record of Decision.

The locations and amounts of sediment to be removed from these areas will depend on the final remedy selected. If sediment removal is part of the final remedial action plan, then post-remediation monitoring of any reconstructed wetlands will be required, in addition to long-term monitoring of any residual contaminated sediments. Residual sediment contamination will include heavy metals, polychlorinated biphenyls, and radionuclides (primarily cesium-137). The volume of residual contamination is still undetermined and will depend on the extent of excavation.

Surface Water/Sediment Long-Term Stewardship Activities

The long-term stewardship responsibilities will be based on the final remedy (to be selected) for the Operable Unit V Record of Decision under CERCLA. No institutional and/or engineering controls have been identified for this site portion at this time.

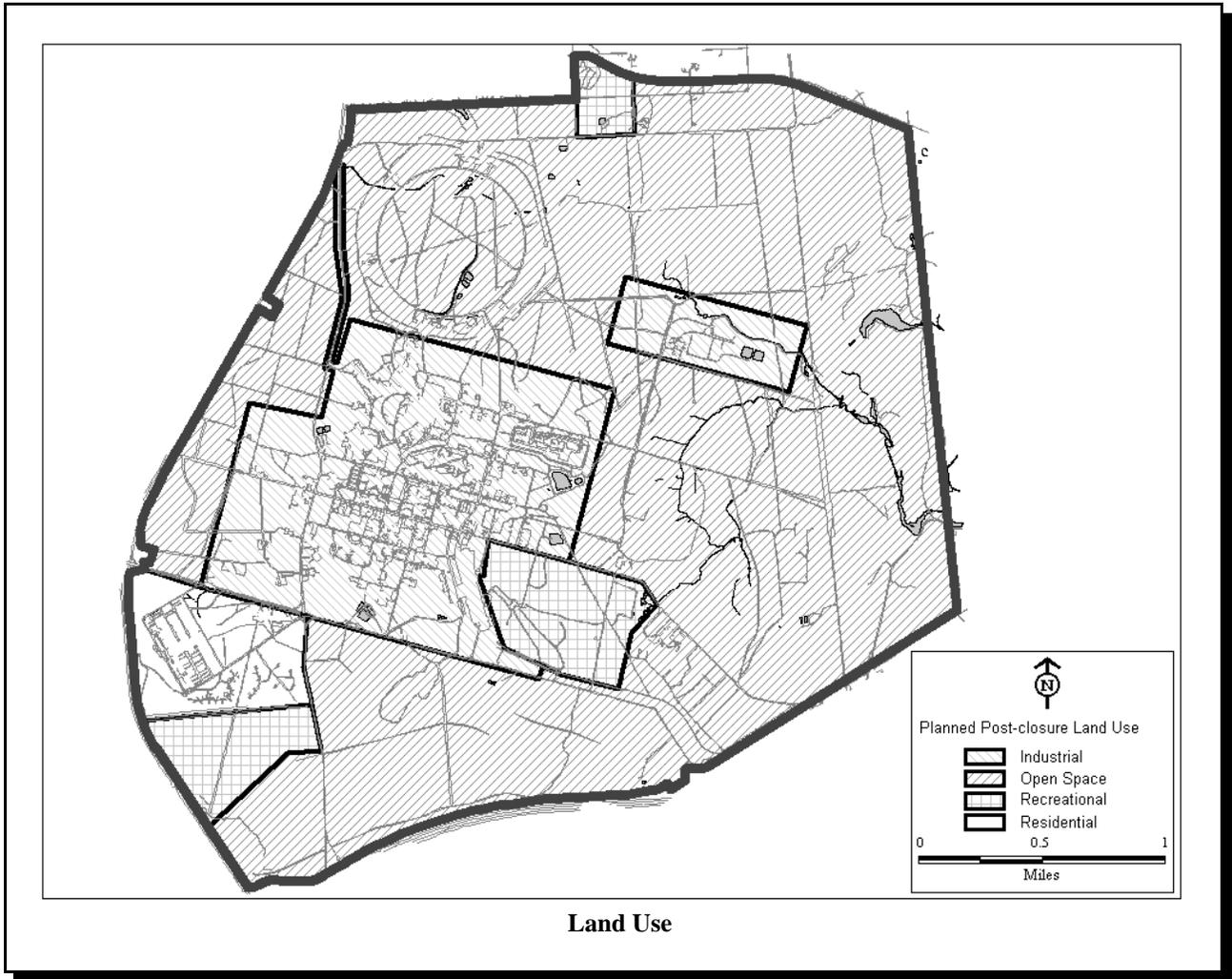
3.7.2 Estimated Long-Term Stewardship Costs for Peconic River

Long-term stewardship costs are based on DOE's assumption that post-remediation monitoring of wetlands will be needed for five years. DOE included the costs prior to the end of FY 2006 in the remediation costs in the planned Environmental Management budget. This estimate is based on Environmental Management's current planning information. If new information is received, DOE will perform additional remediation, as necessary.

<i>Long-Term Stewardship Costs (Constant Year 2000 Dollars)</i>							
<i>FY 2000 - FY 2010</i>	<i>FY 2011 - FY 2020</i>	<i>FY 2021 - FY 2030</i>	<i>FY 2031 - FY 2040</i>	<i>FY 2041 - FY 2050</i>	<i>FY 2051 - FY 2060</i>	<i>FY 2061 - FY 2070</i>	<i>Estimated Total</i>
\$467,988	\$0	\$0	\$0	\$0	\$0	\$0	\$467,988

4.0 FUTURE USES

The Future Use Site Working Group has identified future land use at the Brookhaven National Laboratory as Industrial, Residential, and Open Space/Wildlife Management. Assuming the current mission will continue for the life cycle of this estimate, future use of laboratory facilities will remain industrial, with restricted access. Residential areas currently consist of onsite housing for laboratory workers. DOE assures the future use for all other areas, outside the laboratory's structural configuration, will to be open space/wildlife management.



For additional information about the Brookhaven National Laboratory, please contact:

John Carter
P.O. Box 500, Building 464
Upton, NY 11973-5000
Phone: 631-344-5195
or visit the Internet website at <http://www.bnl.gov>

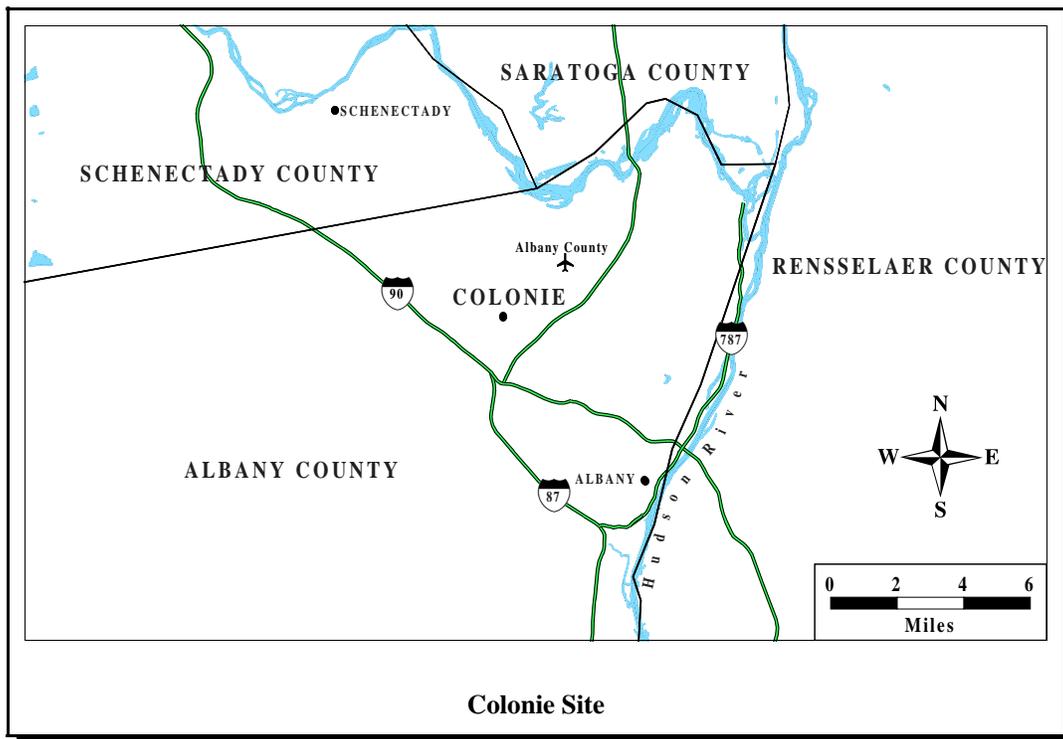
COLONIE SITE¹

SITE SUMMARY

The Colonie Site is located in the Town of Colonie in Albany County, New York, approximately 6.5 kilometers (four miles) northwest of downtown Albany. The site consists of five buildings of varying sizes, paved surfaces, and grasslands. Land use in the vicinity of the site is primarily residential and commercial.

From the late 1930s to 1980s, National Lead Industries owned and operated the Colonie Site. The site was first used as a foundry, and it was later used to manufacture thorium and depleted uranium products under license by the Atomic Energy Commission (a predecessor agency of the U.S. Department of Energy). The operations at the Colonie Site, along with the onsite burial of manufacturing wastes, contaminated buildings, onsite soils, vicinity properties, and groundwater. The National Lead Industries building is contaminated with radioactive and chemical constituents at levels that exceed regulatory guidelines.

In 1983, Congress authorized the cleanup of the Colonie Site and nearby private properties under the Formerly Utilized Sites Remedial Action Program (FUSRAP). Congress also authorized the transfer of site ownership to the Department of Energy. Work began almost immediately to put the facility in a safe shutdown mode. Subsequent radiological surveys identified over 50 vicinity properties (adjacent residential and commercial properties) that had levels of residual radioactivity above regulatory guidelines. The primary contaminants of concern at the site are uranium, thorium, lead, copper, and tetrachlorethene (PCE). The groundwater at the site



¹ The Colonie Site is one of the 21 Formerly Utilized Sites Remedial Action Program (FUSRAP) sites where cleanup responsibility was transferred to the U.S. Army Corps of Engineers (Corps) in accordance with the Energy and Water Development Appropriations Act for FY 1998. At these 21 sites, the Corps is responsible for remediation and DOE is responsible for long-term stewardship activities, if any are deemed necessary. The cleanup decisions for these sites are not yet final and, therefore, the extent of long-term stewardship required for these sites, if any, is not yet known.

is also contaminated with heavy metals and volatile organic compounds (VOCs).

Materials containing low levels of radioactivity were removed from all but three of the vicinity properties and stored inside the site's main building for future disposition. The other three properties are adjacent to the site and will be cleaned up when the site's grounds are remediated. Because the three vicinity properties that have yet to be cleaned up are uninhabited, the contamination poses little or no risk to the public.

Since environmental surveillance at the site began, analytical results have consistently shown that Colonie is not contributing significantly to radioactivity in the environment. The Corps' remedial action for this site is not yet complete and, therefore, the extent of long-term stewardship required, if any, is not yet known.

For more information about the Colonie Site, please contact:

Chief of Public Affairs
New York District
U.S. Army Corps of Engineers
Jacob K. Javits Federal Building
26 Federal Plaza
New York, NY, 10278-0090
Phone: 212-264-0100
or visit the Internet website at: <http://www.nan.usace.army.mil/>

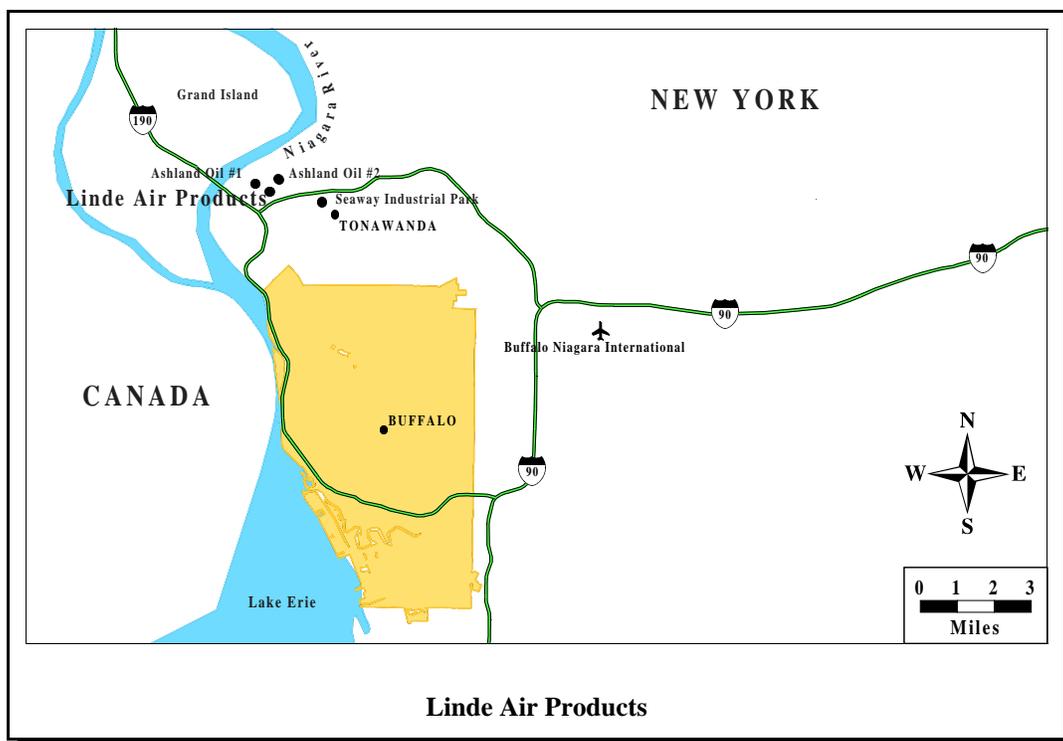
LINDE AIR PRODUCTS SITE ¹

SITE SUMMARY

The Linde Air Products Site is currently owned and operated by Praxair, Inc., as an engineering and development facility. The Linde Air Products Site is located in the Town of Tonawanda, New York, approximately five kilometers (three miles) northwest of Buffalo. The site is bordered on the north and south by industries and small businesses, on the east by Conrail railroad tracks and an open area, and on the west by a park. Numerous residential properties are located near the site.

During the 1940s, the Linde Air Products Site was used for uranium processing for the Manhattan Engineer District and the Atomic Energy Commission (AEC), predecessor agencies of the U.S. Department of Energy (DOE). Waste generated by uranium processing at the site was stored at the Ashland Oil #1 Site. Some waste residues were later moved to the adjacent Ashland Oil #2 Site and the Seaway Landfill.

The Linde Air Products Site was designated by DOE for cleanup under the Formerly Utilized Sites Remedial Action Program (FUSRAP). DOE conducted several radiological surveys that identified several radioactive constituents including uranium, radium-226, and thorium-230.



¹ The Linde Air Products Site is one of the 21 Formerly Utilized Sites Remedial Action Program (FUSRAP) sites where cleanup responsibility was transferred to the U.S. Army Corps of Engineers (Corps) in accordance with the Energy and Water Development Appropriations Act for FY 1998. At these 21 sites, the Corps is responsible for remediation and DOE is responsible for long-term stewardship activities, if any are deemed necessary. The cleanup decisions for these sites are not yet final and, therefore, the extent of long-term stewardship required for these sites, if any, is not yet known.

The Corps' remedial action for this site is not yet complete and, therefore, the extent of long-term stewardship required, if any, is not yet known.

For additional information about the Linde Air Products Site, please contact:

FUSRAP Public Information Center

Buffalo District

U.S. Army Corps of Engineers

1776 Niagara Street

Buffalo, NY 14207-3199

Phone: 800-833-6390

or visit the Internet website at: <http://www.lrb.usace.army.mil>

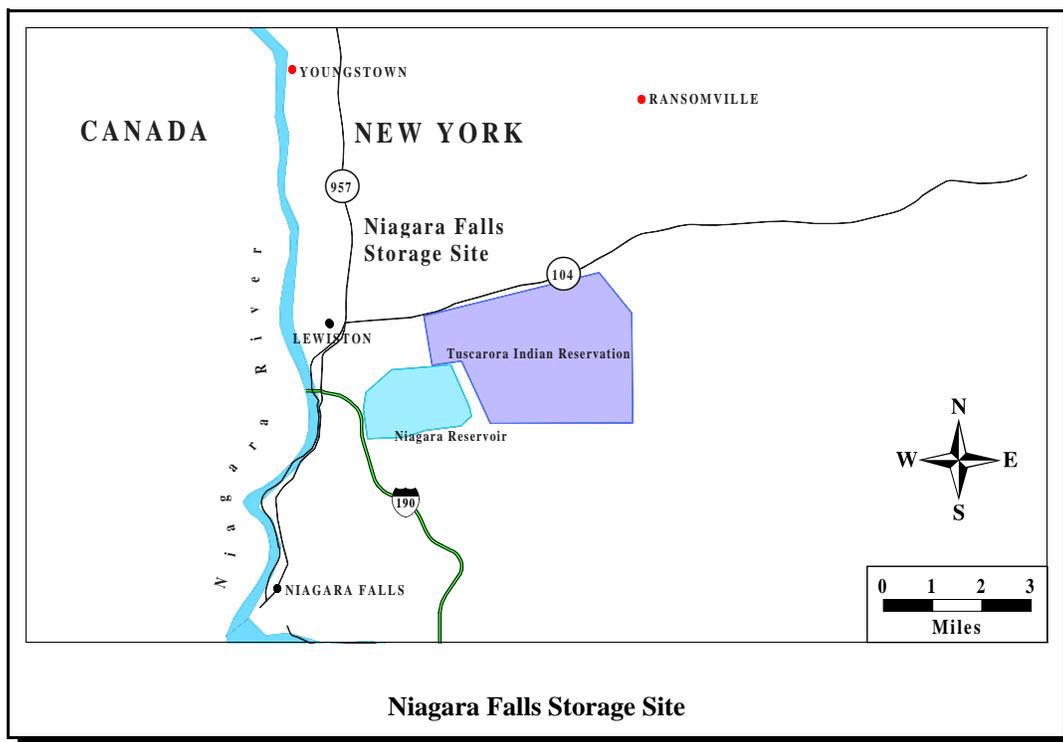
NIAGARA FALLS STORAGE SITE¹

SITE SUMMARY

The Niagara Falls Storage Site is located in Lewiston, New York, about 16 kilometers (10 miles) north of the City of Niagara Falls. The Niagara Falls Storage Site includes a three-story building with adjacent silos, an office building, a small storage shed, a storage building, and a large engineered disposal cell. The site is bordered on the north by a chemical waste disposal facility, on the east and south by a solid waste disposal facility, and on the west by a Niagara Mohawk Power Corporation right-of-way.

The Niagara Falls Storage Site was originally part of the U.S. Army's former Lake Ontario Ordnance Works and was first used by the Manhattan Engineer District, an early predecessor agency of the U.S. Department of Energy (DOE), in 1944 for storing uranium ore processing residues. In 1948, the Atomic Energy Commission (AEC), the successor agency to MED and a predecessor agency of DOE, acquired 611 hectares (1,511 acres) of the Lake Ontario Ordnance Works, including these original storage areas. In the late 1940s and 1950s, additional residues and other radioactive waste were transported to the site from eastern and midwestern states. In 1955, major portions of the AEC site were declared as excess. By 1975, almost all of the residues and waste were consolidated on the current 77-hectare (191-acre) tract and the remainder of the initial acquisition (611 hectares) had been disposed of by the General Services Administration (GSA).

In October 1970 and June 1971, AEC conducted radiological surveys of the 523 hectares (1,320 acres) it formerly



¹ The Niagara Falls Storage Site is one of the 21 Formerly Utilized Sites Remedial Action Program (FUSRAP) sites where cleanup responsibility was transferred to the U.S. Army Corps of Engineers (Corps) in accordance with the Energy and Water Development Appropriations Act for FY 1998. At these 21 sites, the Corps is responsible for remediation and DOE is responsible for long-term stewardship activities, if any are deemed necessary. The cleanup decisions for these sites are not yet final and, therefore, the extent of long-term stewardship required for these sites, if any, is not yet known.

held and found that some areas contained residual radioactive contamination above current guidelines. The primary contaminants of concern were radium-226 and its decay products and thorium-230. Decontamination carried out in 1972 involved the removal of over 11,000 cubic meters (over 14,000 cubic yards) of radioactive soil and debris and relocating it to the current site. In the early 1980s, DOE conducted more comprehensive characterization efforts at the storage site and vicinity properties. Radioactive contamination was detected in onsite buildings, soils, sediments, vegetation, and groundwater; radon emanation from stored and buried residues was also identified. Radioactive contamination above guidelines was also identified at several vicinity properties and locations along drainage ditches. Remedial actions on these public and private vicinity properties and drainage ditches were initiated in 1983. Cleanup was completed at all but three of the vicinity properties by late 1985. Radium-226 concentrations in groundwater did not exceed guidelines for uncontrolled-access sites at either onsite or offsite sampling locations.

In the 1980s, DOE consolidated the radioactive materials in a large engineered disposal cell. The area containing the wastes and residues was covered with an interim clay cap and re-seeded. The cap was designed to retard radon emissions and rainwater infiltration.

The Corps' remedial action for this site is not yet complete and, therefore, the extent of long-term stewardship required, if any, is not yet known.

For additional information about the Niagara Falls Storage Site, please contact:

FUSRAP Public Information Center
Buffalo District
U.S. Army Corps of Engineers
1776 Niagara Street
Buffalo, NY 14207-3199
Phone: 800-833-6390
or visit the Internet website at: <http://www.lrb.usace.army.mil>

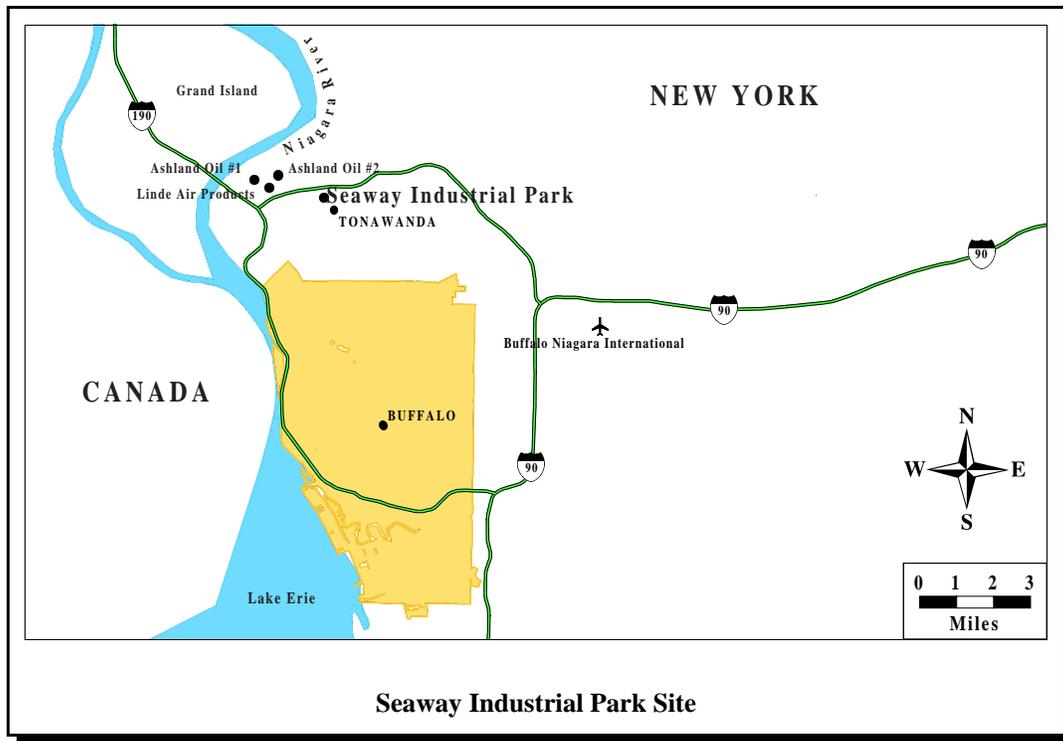
SEAWAY INDUSTRIAL PARK SITE ¹

SITE SUMMARY

The Seaway Industrial Park Site is located in an industrial area of Tonawanda, New York, approximately five kilometers (three miles) northwest of Buffalo. The property is bordered on the north by River Road, on the east and south by a Niagara Mohawk Power Company easement, on the southwest by the Ashland Oil #1 Site, and on the west by United Oil refinery property. The Seaway Industrial Park, owned by the Seaway Industrial Development Company, was used as an industrial landfill.

In the 1970s, the Ashland Oil Company moved radioactively contaminated soil from the Ashland Oil #1 Site to three areas of the Seaway Industrial Park landfill. Subsequent investigations determined that the soil from the Ashland Site contained radioactive contaminants exceeding U.S. Department of Energy (DOE) guidelines.

A remedial investigation of the Seaway Industrial Park Site determined that the primary contaminants of concern are uranium, radium-226, and thorium-230. The area with the greatest concentration of radioactivity is located on the surface. In the other two areas, the radioactive contaminants are buried beneath refuse. A fourth area on the southeastern edge of the Seaway property is contiguous with the radioactive material on the Ashland Oil #1 Site.



¹ The Seaway Industrial Park Site is one of the 21 Formerly Utilized Sites Remedial Action Program (FUSRAP) sites where cleanup responsibility was transferred to the U.S. Army Corps of Engineers (Corps) in accordance with the Energy and Water Development Appropriations Act for FY 1998. At these 21 sites, the Corps is responsible for remediation and DOE is responsible for long-term stewardship activities, if any are deemed necessary. The cleanup decisions for these sites are not yet final and, therefore, the extent of long-term stewardship required for these sites, if any, is not yet known.

The Corps' remedial action for this site is not yet complete and, therefore, the extent of long-term stewardship required, if any, is not yet known. The Ashland #1 Site, Ashland #2 Site, Seaway Industrial Park Site, and Linde Air Products Site are included in the Tonawanda Site integrated environmental documentation process to comply with requirements of the *Comprehensive Environmental Response, Compensation, and Liability Act* and the *National Environmental Policy Act*.

For additional information about the Seaway Industrial Park Site, please contact:

FUSRAP Public Information Center

Buffalo District

U.S. Army Corps of Engineers

1776 Niagara Street

Buffalo, NY 14207-3199

Phone: 800-833-6390

or visit the Internet website at: <http://www.lrb.usace.army.mil>

SEPARATION PROCESS RESEARCH UNIT¹

1.0 SITE SUMMARY

1.1 Site Description and Mission

The Separations Process Research Unit (SPRU) is a former chemical processing pilot plant at Knolls Atomic Power Laboratory that operated in the 1950s. The unit is located approximately 3.2 kilometers (two miles) east of Schenectady, New York in the northeastern part of Schenectady County. The unit occupies approximately eight hectares (20 acres) of the 68-hectare (170-acre) Knolls Atomic Power Laboratory. The SPRU consists primarily of two interconnected buildings: Building G-2 that housed the separations process systems and Building H-2 that housed the liquid waste processing systems. These buildings are approximately 23 meters (75 feet) apart and are connected by an underground pipe tunnel. Additional onsite facilities consist of the tunnel area, tank farm, and waste storage areas. Portions of the two buildings are used as office areas or waste processing facilities; however, parts of the lower levels of the buildings remain substantially contaminated with radioactive materials. Therefore, these areas are not used and have been physically isolated.

LONG-TERM STEWARDSHIP HIGHLIGHTS

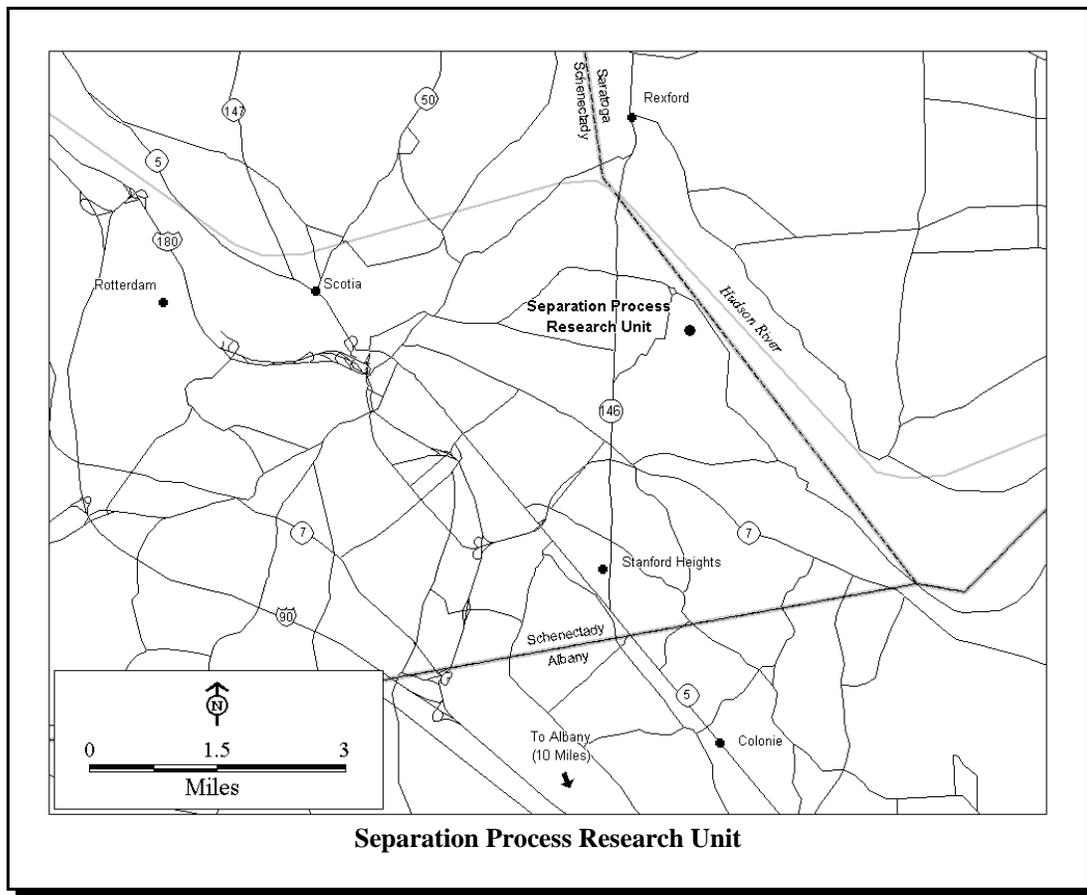
Total Site Area - 8 hectares (20 acres)
Current Landlord - U.S. Department of Energy, Office of Naval Reactors
Expected Future Landlord - U.S. Department of Energy, Office of Naval Reactors
Reason Not Subject to NDAA Requirements - Cleanup activities will not be completed until 2014. The nature and extent of long-term stewardship activities at the sites are unknown at this time.

The SPRU was constructed in 1950 by the U.S. Atomic Energy Commission (a predecessor agency to DOE) as a pilot plant for developing and testing two chemical processes, (i.e., the Reduction and Oxidation Process and the Plutonium-Uranium Extraction Process), for extracting uranium and plutonium from irradiated fuel. The facility was operated by the Materials Production Division of the Atomic Energy Commission during the early 1950s. The facility also was used to support operations at the Hanford Site (in the State of Washington) and the Savannah River Site (in the State of South Carolina).

The SPRU has been in standby status since 1953. Until decontamination and decommissioning activities begin, an onsite surveillance and maintenance program is in place to ensure that the facility remains in a stable condition and that it does not present a risk to the public, the environment, or the onsite work force. In January 2000, DOE's Oakland Operations Office awarded a contract for Phase I (characterization) of the SPRU cleanup project, which is to be completed in 2006.

¹This report is developed in response to a Congressional mandate in the Fiscal Year (FY) 2000 National Defense Authorization Act (NDAA). As directed by the Act, this report addresses current and anticipated long-term stewardship activities at each site, or portions of a site, by the end of calendar year 2006 ("Conference Report on S. 1059, National Defense Authorization Act for Fiscal Year 2000," *Congressional Record*, August 5, 1999).

Based on current planning, cleanup activities at the Separation Process Research Unit site are not expected to be completed until 2014 and, for this reason, the site is not within the scope of this report. The nature and extent of long-term stewardship activities are unknown at this point. This summary of the site is included to provide to assist in documenting the U.S. Department of Energy's (DOE) role at the site.



1.2 Site Cleanup and Accomplishments

Activities at SPRU are in the initial characterization phase, and currently there is no long-term surveillance and maintenance planned in the scope of this project. Based on earlier surveys, soil and facilities at SPRU are contaminated with mixed fission products, including plutonium, americium, uranium, strontium, and cesium. DOE has not begun characterization activities for SPRU. To date, only limited remediation of the site has been completed. Liquid has been removed from process tanks and equipment process lines, and interior spaces of buildings have been partially decontaminated. DOE's Office of Environmental Management plans to complete cleanup of SPRU by 2014. The majority of the cleanup is expected to occur between 2006 and 2014.

The proposed action is to decontaminate and demolish two buildings and the associated ancillary facility structures, including the underground tank farm and pipe tunnels. Environmental restoration is being accomplished in three phases. Phase I of the cleanup effort involves identifying the specific nature and extent of contamination of the buildings and facilities and of the surrounding environmental media (including surface and subsurface soils, surface water and groundwater); conducting a *Resource Conservation and Recovery Act* Facility Investigation for the solid waste management units and areas of concern attributed to activities conducted at the SPRU; evaluating characterization alternatives and technologies; estimating the occupational and public

CURRENT SITE ACCOMPLISHMENTS

- Awarded contract for phase I of site cleanup

BY 2006, DOE WILL

- Complete site and facility characterization
- Complete RCRA Feasibility Investigation

health and safety impacts that will be encountered during the conduct of characterization activities; and implementing interim corrective measures, if necessary. Phase II consists of facility decontamination and dismantlement, waste disposal, completion of a corrective measures study, and implementation of interim corrective measures for areas, including groundwater, requiring further corrective actions. Phase III consists of final site surveys.

Surveillance and maintenance of deactivated facilities will continue until decontamination and decommissioning activities are completed. All radiological and hazardous waste (i.e., low-level waste, mixed low-level waste, transuranic waste, and mixed transuranic waste) will be disposed of at offsite locations. Contaminated onsite soil will be remediated. Soil remediation will likely involve excavating the contaminated soil, backfilling these areas with clean fill (i.e., replacing the area with uncontaminated soil), and covering with top soil to grade. Although the site has not been characterized, remediation of water resources has not been planned.

2.0 POTENTIAL LONG-TERM STEWARDSHIP ACTIVITIES

The nature and extent of long-term stewardship activities to be conducted after the completion of site cleanup is unknown at this time.

3.0 EXPECTED FUTURE USES AND SITE RESPONSIBILITY

The cleaned up SPRU areas will remain part of the Knolls Atomic Power Laboratory, which is expected to continue its operating mission for the Naval Nuclear Propulsion Program.

For additional information about the Separation Process Research Unit, please contact:

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WEST VALLEY DEMONSTRATION PROJECT¹

1.0 SITE SUMMARY

1.1 Site Description and Mission

From 1966 to 1972, the West Valley site reprocessed 640 metric tons uranium (MTUs) of commercial and United States Atomic Energy Commission (AEC) spent nuclear fuel to recover uranium and plutonium. The former spent fuel reprocessing site, which is owned by the State of New York, occupies 90 hectares (230 acres) within the 1,320 hectare (3,300 acre) tract of land called the Western New York Nuclear Service Center (WNYNSC). The site is located approximately 48 kilometers (30 miles) south of Buffalo, New York.

The reprocessing of spent nuclear fuel was conducted by Nuclear Fuel Services, under contract to the State of New York and under license by the AEC (a predecessor agency to the U.S. Department of Energy [DOE] and the U.S. Nuclear Regulatory Commission [NRC]). The facility was shut down in 1972 for modifications to increase its seismic stability and to expand capacity. In 1976, without restarting the operation, Nuclear Fuel Services withdrew from the reprocessing business and indicated its intent not to renew its lease with the site owner, the New York State Energy Research and Development Authority (NYSERDA). The reprocessing activities resulted in 2,000,000 liters (600,000 gallons) of liquid high-level radioactive waste (HLW), stored below ground in HLW tanks, and other radioactive wastes and residual radioactive contamination. The site is also managing 125 spent nuclear fuel elements until they can be shipped to the Idaho National Engineering and Environmental Laboratory in 2001.

The West Valley site was licensed by the AEC, and then the NRC, until 1981, when the license was suspended to execute the 1980 West Valley Demonstration Project (WVDP) Act (P.L. 96-368). In accordance with the WVDP Act, DOE and NYSERDA entered into a Cooperative Agreement effective October 1, 1980, and amended September 1981. The WVDP Act authorized DOE, in cooperation with NYSERDA, to: (1) carry out a liquid HLW management demonstration project; (2) solidify, transport, and dispose of the HLW at the site; (3) dispose of low-level waste (LLW) and transuranic waste produced by the WVDP, in accordance with applicable license requirements; and (4) decontaminate and decommission facilities used for the WVDP, in accordance with requirements prescribed by the NRC. The NRC is responsible for prescribing decontamination and decommissioning criteria (even though the NRC license is suspended until completion of the Demonstration Project). NYSERDA is responsible for all site facilities and areas outside the scope of the WVDP Act and the

SITE HIGHLIGHTS

Total Site Area - 90 hectares (230 acres)
Current Landlord - U.S. Department of Energy; New York State Energy Research and Development Authority

Expected Future Landlord - New York State Energy Research and Development Authority

Reason Not Subject to NDAA Requirements - Decisions not yet made on responsibility for long-term stewardship activities

¹This report is developed in response to a Congressional request in the Fiscal Year (FY) 2000 National Defense Authorization Act (NDAA). As requested by the Act, this report addresses current and anticipated long-term stewardship activities at each site or portion of a site by the end of calendar year 2006 ("Conference Report on S.1059, National Defense Authorization Act for Fiscal Year 2000," *Congressional Record*, August 5, 1999).

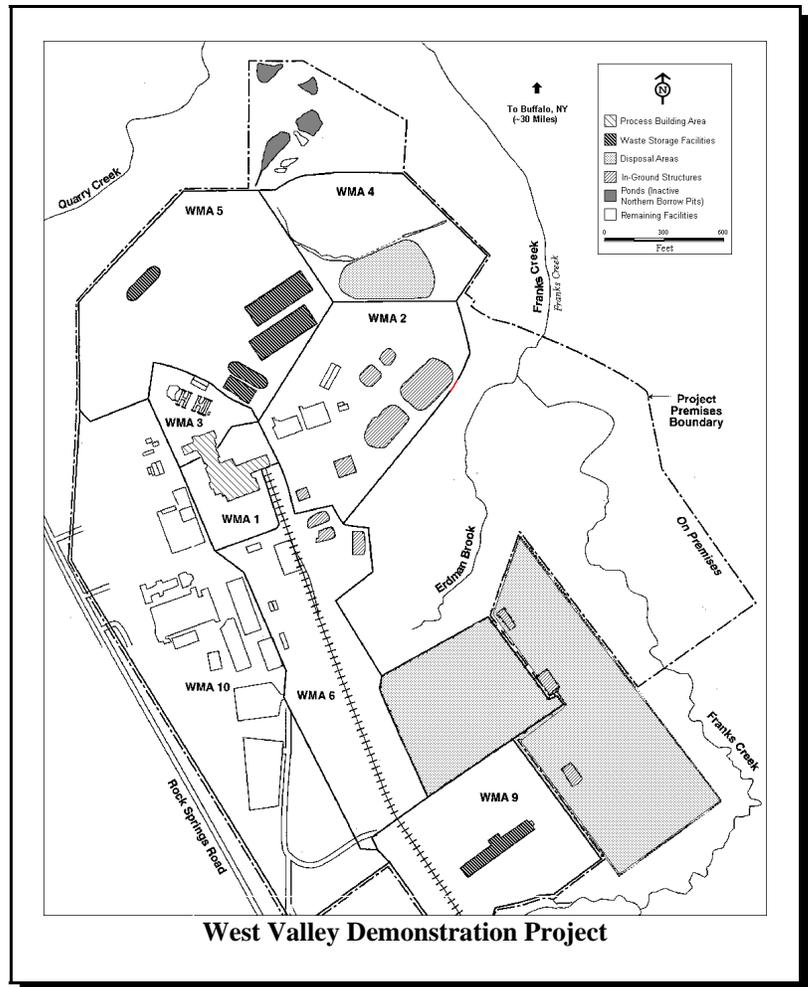
DOE does not own property at the West Valley Demonstration Project, and the decision has not been made regarding who will be responsible for long-term stewardship activities at the site. This summary of the site cleanup and future use is provided to assist in documenting DOE's role at the site. DOE does have a current mission at the site and is responsible for decommissioning the facilities in accordance with the *West Valley Demonstration Project Act*. (See Section 2.1.2 of Volume I).

Cooperative Agreement.

1.2 Site Cleanup and Accomplishments

The WVDP is currently removing liquid HLW from underground HLW tanks at the site, vitrifying it, and storing it onsite for eventual offsite disposal in a Federal repository. The primary vitrification campaign began in June 1996 and was completed ahead of schedule in June 1998. Vitrification of the HLW tank heels is currently underway and is scheduled to be completed in FY 2001. Following the vitrification of the HLW and completion of Environmental Impact Statements (EISs) for facility decontamination and waste management, and closure or long-term site management, the equipment and facilities used in carrying out the project will be decontaminated and decommissioned.

The NRC published a draft policy statement on December 3, 1999, describing the Commission's decision to use the License Termination Rule (62 FR 39058, July 21, 1997) as general decontamination and decommissioning criteria for the WVDP. Specific criteria will be prescribed following completion of an EIS for facility closure or long-term management. This EIS is planned to be initiated in the near future.



An EIS for project completion and site closure or long-term management was initiated in 1989. After public review of the draft EIS, NYSERDA, with cooperation from DOE, convened a West Valley Citizen Task Force (CTF) in early 1997 to obtain stakeholder input. CTF recommendations were provided in 1998 as advice to DOE and NYSERDA in the development of a preferred alternative. The CTF generally does not believe the West Valley site is suitable for long-term isolation of waste and, therefore, favors disposal of the waste offsite at suitable and safe disposal facilities. However, the CTF recognizes that some wastes may not be able to be removed from the site in the near future. Currently, DOE and NYSERDA are working together with stakeholders and with NRC to formulate a preferred alternative for closure or long-term management of the site.

The DOE recently announced to the CTF, other stakeholders, and involved agencies its plan to modify the current EIS process by reducing the scope of the existing Project completion and site closure or long-term management EIS (DOE/EIS-0226-D) to include only the evaluation of DOE responsibilities for decontamination and waste management for Project facilities. This will allow the DOE to make decisions on activities for which it is solely responsible under the WVDP Act, and to efficiently transition from HLW vitrification into facility

decontamination and offsite waste disposition. DOE envisions this decontamination and waste management EIS process to be completed within two years. The DOE also announced its plan to initiate a separate EIS to evaluate facility closure, long-term management, and stewardship alternatives for the WVDP and the WNYNSC, because of the difficult regulatory and stakeholder issues associated with agency decision-making on these actions. The DOE plans to prepare this EIS jointly with NYSERDA, and to include the NRC as a cooperating agency and the New York State Department of Environmental Conservation as an involved agency. The outcome of the ongoing discussions between DOE and NYSERDA to determine a preferred alternative will be reflected in this new EIS for facility closure and/or long-term management. Current conservative schedules indicate that this new EIS would be completed in the 2005 timeframe. Federal and/or state long-term stewardship responsibilities, if required as a result of decisions made under the closure or long-term management EIS, will be identified in the Record of Decision.

The major areas for which this two-EIS process will determine a path forward for WVDP project completion and Western New York Nuclear Service Center site closure or long-term management involve the following major facilities and areas:

– **Underground High-Level Waste Storage Tanks**

There are four underground waste storage tanks at the WNYNSC, that were part of the spent nuclear fuel reprocessing system, including two large carbon steel tanks, each with a capacity of 2.8 million L (750,000 gallons) and two smaller stainless steel tanks, each with a capacity of 51,000 L (13,500 gallons). One of the large tanks was used to store liquid HLW from reprocessing operations, and the other was maintained as an empty spare tank. The WVDP later used the spare tank to house its Supernatant Treatment System ion exchange columns that were used during HLW pretreatment and vitrification operations. During spent fuel reprocessing operations, one of the smaller tanks was used to hold waste from a THOREX reprocessing run, and was later used by the WVDP for receiving wastes from the vitrification waste header system after the THOREX waste was removed. The second smaller tank was not used during reprocessing, but the WVDP later used the tank to contain decontaminated supernatant and decontaminated HLW sludge wash water prior to solidification of these wastes in cement.

The DOE is currently removing and vitrifying tank heel waste from the HLW tanks, and will continue to do so to the extent technically and economically practical. DOE will make decisions on removing any in-tank components that were installed as part of HLW operations after the decontamination and waste management EIS is prepared and evaluated. Decisions on final disposition of the HLW tanks will be made following completion of the closure or long-term management EIS. Final disposition alternatives to be evaluated will include, at a minimum, exhuming the tanks for offsite disposal or grouting and closing the tanks in place with long-term monitoring and maintenance.

– **Vitrification Facility**

The DOE constructed a new facility to be used for vitrifying HLW. The new facility was located adjacent to and connected with the former fuel reprocessing building to make use of existing reprocessing facility structure for vitrification support systems and HLW canister storage. The newly constructed vitrification facility consists of a stainless steel-lined concrete cell which houses the vitrification melter and supporting HLW solidification systems, along with ancillary areas around the outside of the cell for control and maintenance of vitrification operations. The interior of the vitrification cell can only be accessed remotely because of high levels of radiation associated with HLW vitrification.

The WVDP is currently developing plans to flush the vitrification system, and is also segregating and

volume-reducing expended components associated with vitrification. Decisions on vitrification facility decontamination and disposition of system components will be made following preparation of the EIS for decontamination and waste management. Final disposition of the facility structure itself will be decided following completion of the closure or long-term management EIS. Alternatives that may be evaluated for facility disposition include complete removal of the facility, and in-place closure with long-term monitoring and maintenance.

– **Former Spent Nuclear Fuel Reprocessing Building**

The former spent nuclear fuel reprocessing building consists of a series of thick-walled concrete cells and adjacent aisles and areas that housed the mechanical and chemical systems used by Nuclear Fuel Services to process spent nuclear fuel to recover uranium and plutonium for subsequent reuse in the nuclear industry. This facility operated from 1966 through 1972 under a Provisional Operating License issued by the AEC. The building covers an area of approximately 82 x 40 m (270 x 130 ft.) and is several stories tall. Nuclear Fuel Services performed decontamination activities following cessation of reprocessing operations, and the WVDP performed additional decontamination during the 1980's in order to reduce personnel radiation doses and to prepare and install systems in some areas of the building that would support vitrification operations. However, some areas of the building were not decontaminated and remain highly contaminated as a result of fuel reprocessing operations. These areas can only be accessed remotely. In addition, one large cell in the former reprocessing building is being used for interim storage of the vitrified HLW canisters, pending their eventual removal from the site for final disposal.

The DOE is currently performing limited decontamination in certain areas of the building, and is also preparing to access two of the more highly contaminated areas to perform limited waste removal. Decisions on the extent of more comprehensive building decontamination and waste disposal will be made following completion of the decontamination and waste management EIS. Final disposition of the building itself will be made following completion of the closure or long-term management EIS. Alternatives to be evaluated in the closure or long-term management EIS will include, at a minimum, complete removal of the building, and in-place closure with long-term monitoring and maintenance. A leak during reprocessing operations also produced a source of Strontium-90 contamination in a groundwater plume located beneath and downgradient of the building. Decisions on disposition of the reprocessing facility will consider the source of the groundwater contamination, and will be integrated with decisions on management of the contaminated groundwater plume.

– **Nuclear Regulatory Commission-licensed Disposal Area (NDA)**

The Nuclear Regulatory Commission-Licensed Disposal Area (NDA) is a 5.5-acre inactive waste disposal site that was used by Nuclear Fuel Services to dispose of higher activity waste from reprocessing operations. It was subsequently used by DOE from 1982 until 1986 to dispose of some wastes that resulted from systems operations and facility decontamination activities. The NDA is estimated to contain approximately 360,000 cubic feet of waste, and a total of 300,000 curies (decay corrected to year 2000). Estimated disposals of WVDP waste in the NDA account for more than 50% of the total volume of waste disposed, but less than 1% of the curies.

Final decisions on disposition of the NDA will be made following completion of the EIS for closure or long-term management. Alternatives that will be considered include, at a minimum, exhumation and offsite waste disposal, and in-place closure and long-term management.

– State-licensed Disposal Area (SDA)

The State-Licensed Disposal Area (SDA) is a 16-acre inactive waste disposal site that was permitted and operated by the State of New York, via Nuclear Fuel Services, from 1963 until 1975 for commercial receipt and burial of wastes from a wide variety of radioactive waste generators and for disposal of lower activity waste from West Valley spent fuel reprocessing operations. This disposal area is located adjacent to the NDA, and is still managed entirely by the State of New York. It is estimated that the SDA may contain more than 2.5 million cubic feet of waste and more than 200,000 curies (decay corrected to year 2000).

NYSERDA will make a decision on disposition of the SDA following completion of the closure or long-term management EIS. Alternatives that will be evaluated include, at a minimum, exhumation and offsite waste disposal, or in-place closure and long-term monitoring and maintenance.

2.0 POTENTIAL LONG-TERM STEWARDSHIP ACTIVITIES

Since the EIS for closure or long-term management of the WVDP and the WNYNSC has yet to be prepared, the site end-state has yet to be determined. That EIS will be used to evaluate alternatives that will require long-term surveillance and maintenance, as well as the use of institutional controls. Even though final decisions have not been made regarding long-term stewardship responsibilities at the site, it is expected that some of the areas and facilities discussed may require long-term stewardship activities.

For example, if decisions are made to close any of the previously discussed structures or facilities in place, it is anticipated that a long-term stewardship program would be required. While not yet defined, this stewardship program would be expected to involve a regimen of actions, including monitoring and maintenance of physical controls, including fencing and signage as well as engineered barriers such as caps, along with an environmental monitoring program to verify continued performance of the closed units and to ensure timely identification of any problems that may develop. Components of a long-term stewardship program will be developed and evaluated in the closure or long-term management EIS, where appropriate, according to the alternatives that will be evaluated in that EIS. DOE recognizes that stewardship requirements and responsibilities must be identified and evaluated as part of decision making for ultimate disposition of WVDP facilities.

The length of time that may be required for stewardship of Project facilities, groundwater contamination, and the disposal areas could vary, based on the nature of the wastes and the radionuclides contained within that waste. The Strontium-90 contamination in the groundwater plume would be expected to decay to background levels within 300 years. However, other longer-lived radionuclides such as Uranium and Plutonium in other units on the site could require perpetual stewardship because of their long half-lives.

3.0 EXPECTED FUTURE USE

NYSERDA owns the entire 3,300 site, including the WVDP. DOE does not anticipate any future Federal use of the site or facilities upon completion of the requirements of the WVDP Act. However, since decisions on the end state of the WVDP have not yet been made, nor the impacts cumulatively assessed, it is premature to assume that DOE will not have any long-term stewardship obligations at the West Valley site. The ultimate future use of the site, as well as the ultimate site steward, will be determined, in part, by any long-term stewardship requirements that are a part of the selected closure or long-term management alternative for the WVDP and WNYNSC.

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