

Red File

INSTALLATION RESTORATION PROGRAM
LANDFILL LF-023 SOURCE CONTROL
RECORD OF DECISION

002

PLATTSBURGH AIR FORCE BASE
PLATTSBURGH, NEW YORK

DRAFT FINAL

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GLOSSARY OF ACRONYMS AND ABBREVIATIONS

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DECLARATION

SITE NAME AND LOCATION

Plattsburgh Air Force Base (AFB), Landfill LF-023
Plattsburgh, New York

STATEMENT OF BASIS AND PURPOSE

This decision document presents a selected source control remedial action that will provide containment of wastes at Landfill LF-023 on Plattsburgh AFB in Plattsburgh, New York. This decision document was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan. Through this document, Plattsburgh AFB plans to remedy the potential exposure risk to human health and welfare and the environment posed by surface soil at LF-023. This decision is based on the Administrative Record for the site, which was developed in accordance with Section 113(k) of CERCLA and which is available for review at Plattsburgh AFB in Plattsburgh, New York. The attached index identifies the items comprising the Administrative Record upon which the selection of the remedial action is based (see Appendix A).

The New York State Department of Environmental Conservation (NYSDEC) and the U.S. Environmental Protection Agency (USEPA) concur with the selected remedy. The State's statement of concurrence with this selected remedy is presented in Appendix B.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from LF-023, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to human health and welfare and the environment.

DESCRIPTION OF THE SELECTED REMEDY

The action described in this decision document addresses the principal threat at LF-023 by preventing endangerment to human health and welfare and the

environment through institutional controls and containment of the landfill to minimize (1) exposure to surface soil contaminants and (2) leaching of contaminants present in surface soils and waste.

The selected source control remedy includes establishing institutional controls, constructing a low-permeability barrier cover system over the landfill to isolate contaminated soils and minimize infiltration of water into the landfill. The remedy also includes the development of a post-closure plan specifying inspection, maintenance, and monitoring programs to be conducted over a 30-year period. In addition, institutional controls for this site will be incorporated into the Plattsburgh AFB Comprehensive Plan. This will ensure that future owners will be made aware of the landfill location and are informed that the integrity of the final cover system, or any other component of the containment or monitoring system must not be compromised.

This ROD addresses the groundwater only in reference to source control. A separate Feasibility Study (FS), Proposed Plan, and ROD will be prepared to address potential risks associated with groundwater, surface water, and sediment.

STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with federal and state requirements that are applicable or relevant and appropriate to the source control remedial action, and is cost-effective. This remedy was evaluated along with others that utilize permanent solutions and alternative treatment technologies or resource recovery technologies. However, because treatment of the principal threats at the site was not found to be practicable, this remedy does not satisfy the statutory preference for treatment as a principal element of the remedy. Treatment technologies were identified during the development and initial screening of alternatives, but were determined to be infeasible for LF-023 because (1) there are no on-site hot spots that represent major sources of contamination and (2) the estimated large volume of waste at the site preclude a remedy in which contaminants could be excavated and treated effectively.

Because this remedy will result in hazardous substances remaining on site, a review will be conducted by Plattsburgh AFB, USEPA, and NYSDEC within five years after closure to ensure that the source control remedy continues to provide adequate protection of human health and the environment. This review will be conducted at least every five years as long as hazardous substances remain on site at levels that may pose a risk to human health and the environment.

CONSTANTINE SIDAMON-ERISTOFF
Regional Administrator, USEPA Region II

Date

DAYRE C. LIAS
Colonel, USAF
Chairman, Environmental Protection Committee

Date

1.0 SITE NAME, LOCATION, AND DESCRIPTION

Plattsburgh Air Force Base (AFB) is located in Clinton County in northeastern New York State, bordered on the north by the City of Plattsburgh, on the south and west by the Town of Plattsburgh, and on the east by Lake Champlain (Figure 1). The base is approximately 26 miles south of the Canadian border and 167 miles north of Albany. Landfill LF-023 is located west of the runway approximately 300 feet from the Plattsburgh AFB boundary (Figure 2).

Access to the landfill from the east and south is restricted because the site is bordered by a controlled access area. Access from the north and west is somewhat less restricted, but is limited by an intact 4-foot-high, three-wire fence posted with "No Trespassing" signs. This area is patrolled regularly by Plattsburgh AFB security personnel. Vehicles can access the landfill via a dirt road leading from the Perimeter Road within the controlled access flightline area through a gate near the Fire Training Area (FT-002).

An obstacle course in the northeast portion of LF-023 is used regularly by U.S. Air Force personnel during the warmer months. Other military and civilian personnel are not likely to come in contact with the landfill.

LF-023 is approximately 600 feet northeast of a small mobile home development on Old NY Route 22, near the interchange with Interstate 87. A dirt road formerly led from the mobile home park road to the northeast and onto the base, just south of LF-023. This road intersects with Perimeter Road on base. Vehicle access via this road from off base is prevented by an earthen barrier and gate. The area between LF-023 and the mobile home park is mostly wooded. The nearest on-base housing is more than 6,000 feet east of the site. The light industrial area along Route 22 is approximately 600 feet north of the site.

Site topography slopes gradually toward the east and south with a surface gradient of approximately 0.026. There are no surface water features within the LF-023 site; however, shallow groundwater discharges to the ground surface downgradient of the landfill in seeps and drainages approximately 600 feet south of the site.

The plant community at LF-023 consists of a pitch pine plantation surrounding an open area with sparse weedy vegetation. The wetland south of the site is primarily a red maple-hardwood swamp, and is regulated by the New York State Department

SECTION 1

of Environmental Conservation (NYSDEC). Several species of birds, mammals, reptiles, and amphibians may inhabit the site; however, no state or federally listed or proposed endangered or threatened species are known to exist within 2 miles of Plattsburgh AFB.

Site geology consists of approximately 80 feet of sand, 5 feet of silt, 10 feet of clay, and 25 feet of till overlying carbonate bedrock. Soil within the landfill is poorly graded fine-to-medium sand with trace silt, and appears to be native soil mined in the area. Two aquifers at the site include an unconfined aquifer in the sand unit (below the depth of waste), located approximately 30 feet below ground surface (bgs), and a confined aquifer in the bedrock. Groundwater in the unconfined aquifer flows south and southeast toward Lake Champlain and a topographic low south of the site. Groundwater in the confined aquifer flows east toward Lake Champlain.

A more complete description of LF-023 can be found in the LF-022/LF-023 Remedial Investigation (RI) Report on pages 1-5 through 1-8 and 4-1 through 4-13 (ABB-ES, 1992a).

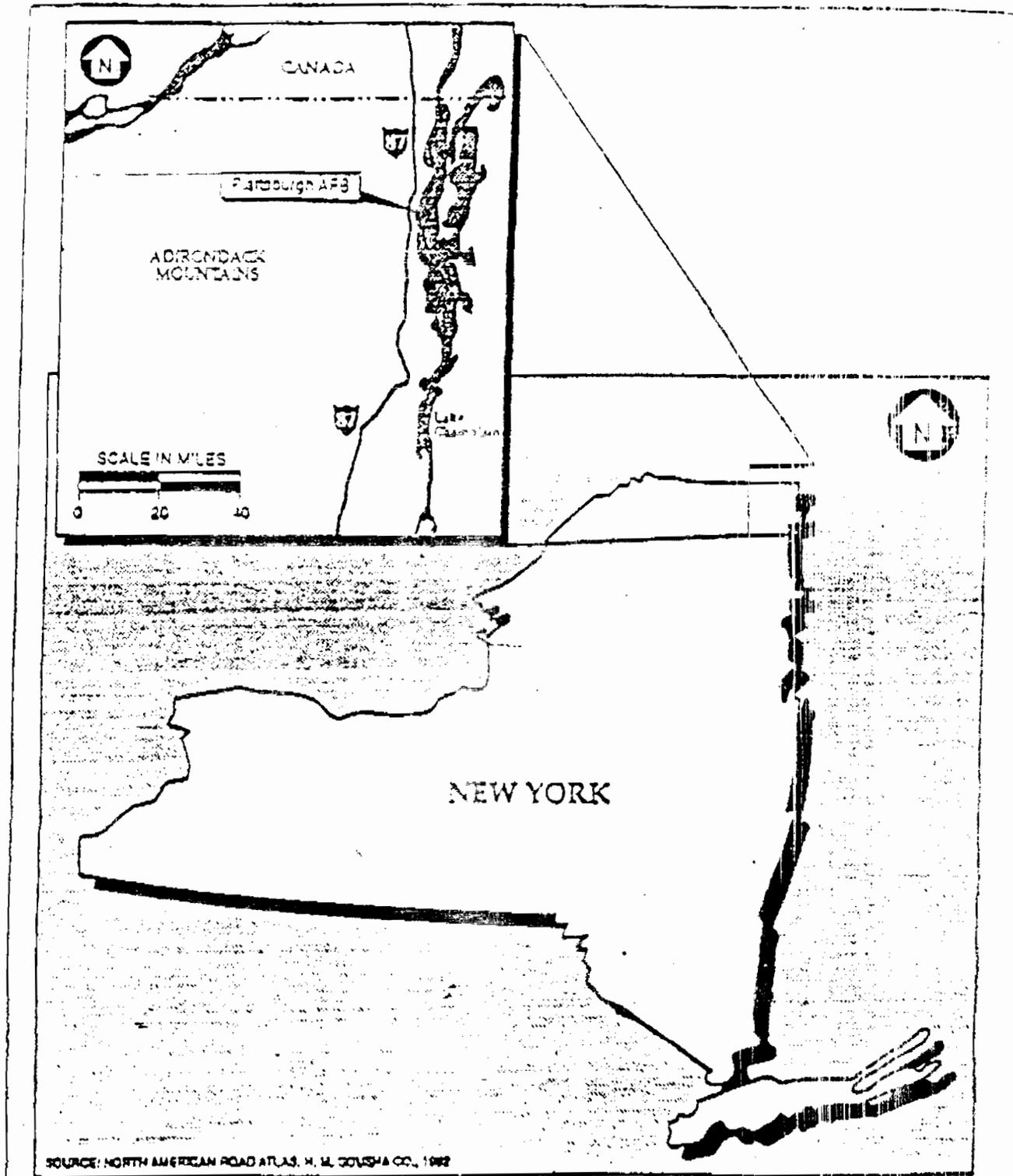


FIGURE 1
VICINITY LOCATION MAP

PLATTSBURGH AFB
ABB Environmental Services, Inc.

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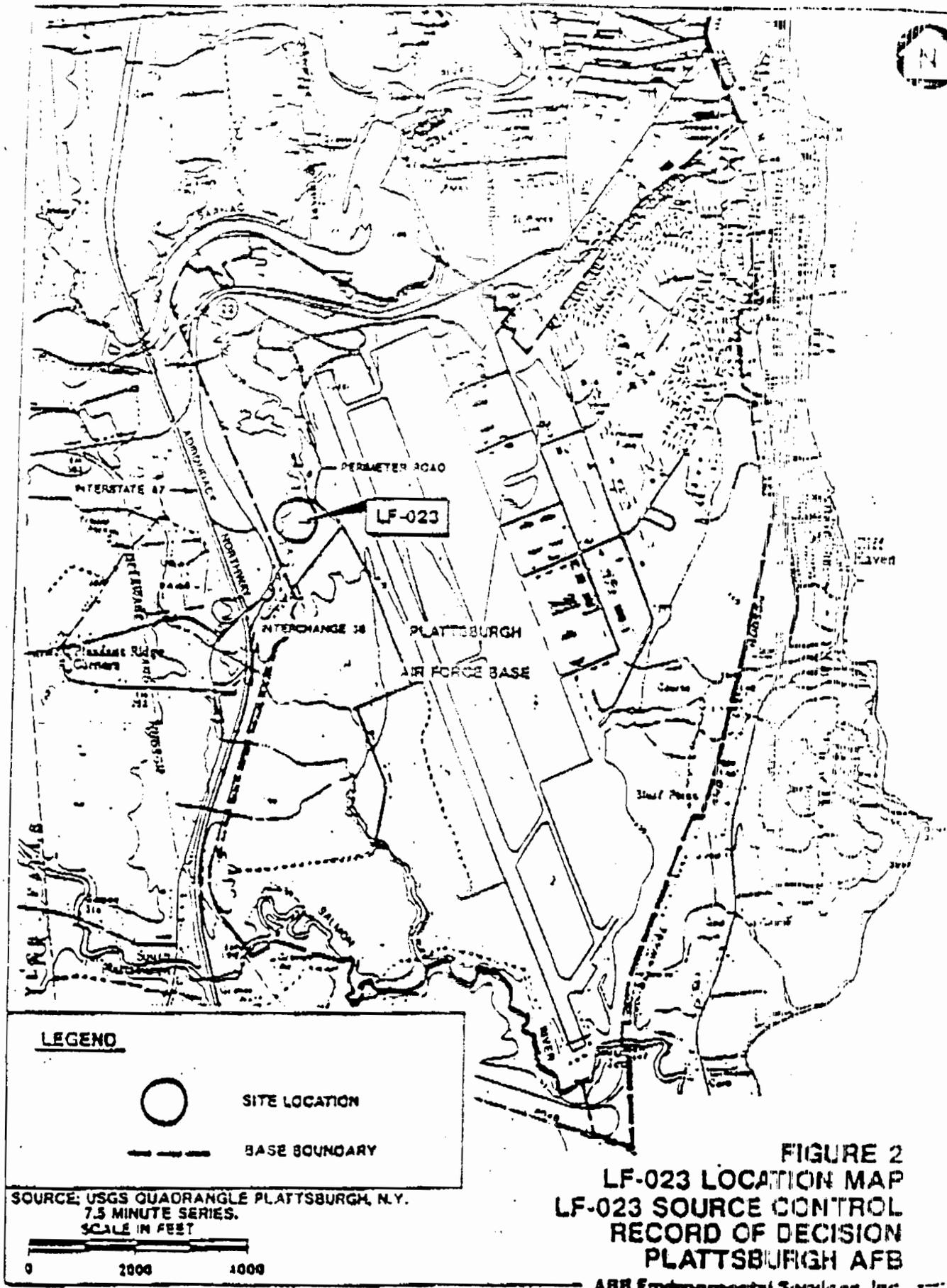


FIGURE 2
LF-023 LOCATION MAP
LF-023 SOURCE CONTROL
RECORD OF DECISION
PLATTSBURGH AFB
 ABB Environmental Services, Inc.

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2.0 SITE HISTORY

In accordance with Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), Plattsburgh AFB is publishing this Record of Decision (ROD) to address public review and comment on the selected containment alternative, known as a remedial alternative, for LF-023. Plattsburgh AFB, in consultation with NYSDEC and the U.S. Environmental Protection Agency (USEPA), considered public comments as part of the final decision-making process for selecting the LF-023 source control remedy. This ROD summarizes the results conclusions of and the RI, Feasibility Study (FS), and Proposed Plan.

2.1 LAND USE AND RESPONSE HISTORY

LF-023, the last active landfill at Plattsburgh AFB, is approximately 500 feet wide and 800 feet long and reportedly received domestic wastes for disposal from 1965 to 1981 (Figure 3). Daily operations consisted of digging 25-foot-deep trenches, spreading and compacting the trash (typically bagged household garbage), and backfilling with 6-inch layers of sandy soil. Hazardous wastes were not routinely disposed of in this landfill; however, hazardous materials might have been deposited. The maximum volume of fill is estimated at 406,000 cubic yards. Since landfilling operations ceased, secondary growth has begun to cover the site and an exercise training course has been constructed in the northern section of the site.

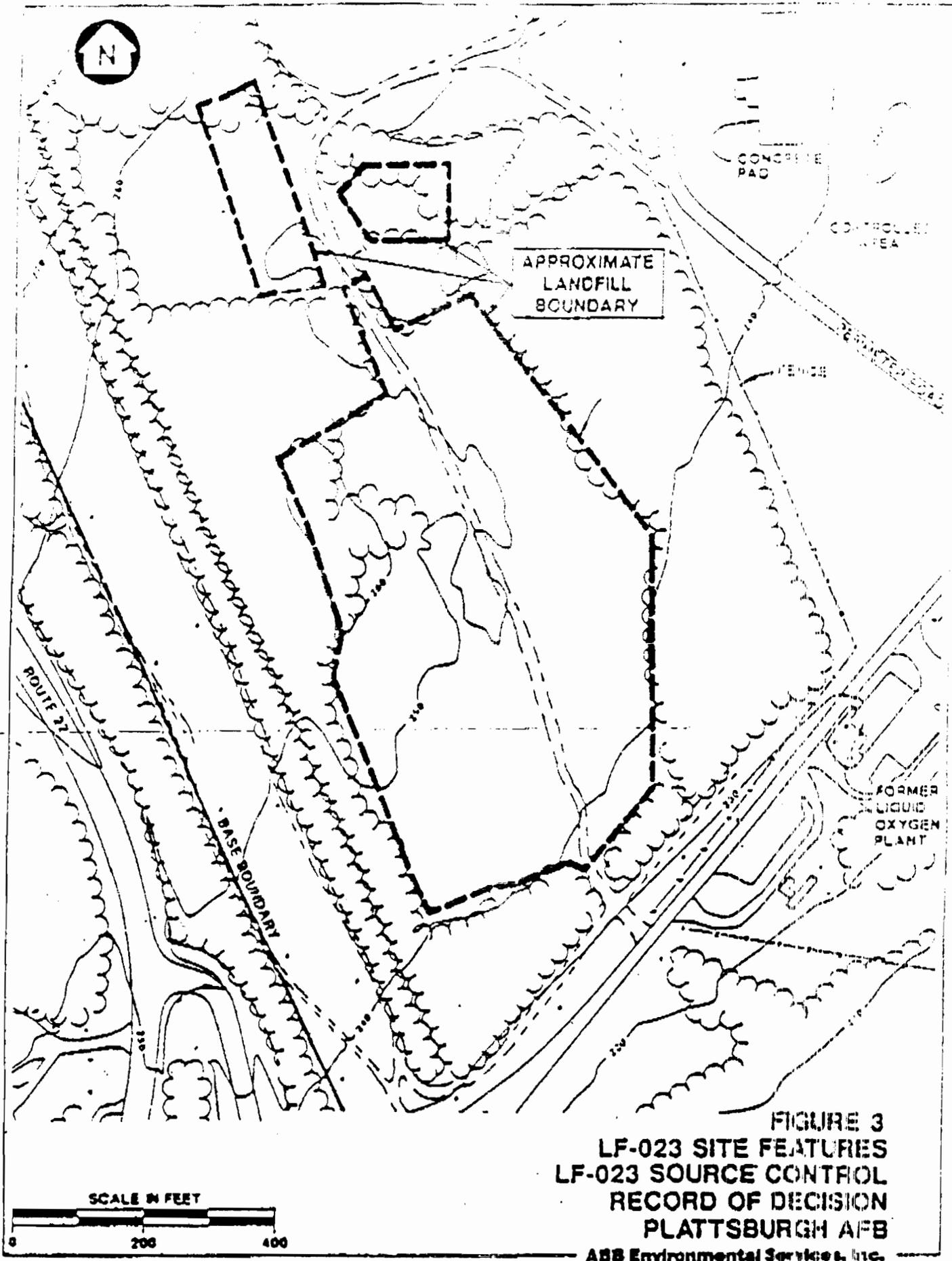
Several site investigations have been conducted at LF-023 as part of the Installation Restoration Program (IRP) at Plattsburgh AFB. A Preliminary Assessment verified that the site was potentially contaminated. The Preliminary Assessment prompted a Site Inspection (SI), which confirmed the presence of contamination. SI activities included soil, waste, and groundwater sampling. An RI was conducted to characterize the nature and extent of contamination at LF-023 and included groundwater, surface soil, sediment, and surface water sampling. A more detailed description of the site history can be found in the RI Report on pages 1-10 through 1-11 (ABB-ES, 1992a).

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2.2 FEDERAL FACILITIES AGREEMENT HISTORY

Field investigation activities at LF-023 have been conducted as part of the Defense Environmental Restoration Program (DERP), which was established to clean up hazardous waste disposal and spill sites at Department of Defense facilities nationwide. The IRP is the U.S. Air Force subcomponent of the DERP that specifically deals with investigating and remediating sites associated with suspected releases of toxic and hazardous materials, such as Plattsburgh AFB. The IRP operates under the scope of CERCLA, as amended by the 1986 Superfund Amendments and Reauthorization Act (SARA).

The Strategic Air Command (SAC) entered into an Interagency Agreement (IAG No. 1758-1758-A1) with the Department of Energy (DOE), under which DOE provides technical assistance for implementation of SAC IRPs and related activities. SAC requested DOE support in assessing the extent of contamination at sites on Plattsburgh AFB. Martin Marietta Energy Systems, Inc. (MMES) was assigned the responsibility for managing the contamination assessment effort under the IAG through the Hazardous Waste Remedial Actions Program. In 1986, the IRP technical performance at Plattsburgh AFB was assigned to ABB Environmental Services, Inc. (ABB-ES), an MMES subcontractor (formerly E.C. Jordan Co.). The IRP at Plattsburgh AFB has included (1) a Preliminary Assessment to evaluate which sites are potentially contaminated, (2) Sfs to confirm the presence or absence of contamination at identified sites, and (3) an ongoing RI program at sites confirmed to have contamination. In November 1989, Plattsburgh AFB was included on the National Priorities List (NPL) of sites and will be remediated according to the federal facilities agreement entered into among the U.S. Air Force, the USEPA, and NYSDEC on September 12, 1991.



**FIGURE 3
LF-023 SITE FEATURES
LF-023 SOURCE CONTROL
RECORD OF DECISION
PLATTSBURGH AFB**

ABB Environmental Services, Inc.

3.0 COMMUNITY PARTICIPATION

Throughout Plattsburgh AFB's history, Plattsburgh AFB has kept the community and other interested parties apprised of activities at LF-023 through informational meetings, fact sheets, press releases and public meetings.

On August 1, 1989, Plattsburgh AFB held its first Technical Review Committee (TRC) meeting to involve members of the Clinton County community and state and federal regulatory agencies in decisions concerning IRP environmental response activities. The TRC currently meets quarterly to discuss plans and results of RI and FS activities. During December 1990, Plattsburgh AFB released a community relations plan that outlined a program to address community concerns and keep citizens informed about and involved in activities during the remedial process.

On August 4, 1992, Plattsburgh AFB made the LF-023 Administrative Record available for public review at Plattsburgh AFB in Plattsburgh, New York. Plattsburgh AFB published a notice and brief analysis of the Proposed Plan in the Press-Republican and made the Proposed Plan available to the public at the Plattsburgh Public Library.

On August 4, 1992 Plattsburgh AFB held a public informational meeting to discuss the results of the RI and the cleanup alternatives presented in the FS, present the Proposed Plan, and answer questions from the public. Immediately following the informational meeting, Plattsburgh AFB held a public hearing to discuss the Proposed Plan and to accept oral comments. From August 4, 1992 to September 3, 1992, Plattsburgh AFB held a 30-day public comment period to accept public comment on the alternatives presented in the FS and the Proposed Plan and on any other documents previously released to the public. A transcript of the public hearing, the written comments received during the public comment period, and Plattsburgh AFB's response to comments are included in Appendices C and D.

4.0 SCOPE AND ROLE OF OPERABLE UNIT OR RESPONSE ACTION

Due to the nature of its primary mission, Plattsburgh AFB is engaged in a wide variety of operations. A number of operations require the use, handling, storage, or disposal of hazardous materials. The IRP addresses past instances when these materials came into contact with the environment through accidental spills, leaks in supply piping, landfill operations, burning of waste liquids during fire training exercises, and the cumulative effect of operations conducted at the base's flight line and industrial area. These are the activities and circumstances through which contaminants of concern came into contact with site-related soil, sediment, surface water and/or groundwater. The suspected sources of contamination at Plattsburgh AFB sites are solvents, fuels, pesticides, and polychlorinated biphenyls (PCBs). Currently, there are thirty-nine IRP sites.

The LF-023 source control remedial action will meet most of the remedial response objectives identified for this site. These include:

1. Minimize potential future human health and current and future ecological risks associated with exposure to polynuclear aromatic hydrocarbons (PAHs) in surface soil.
2. Minimize potential future human health risks associated with exposure to vinyl chloride in groundwater.
3. Minimize potential future human health risks associated with exposure to PAHs in dust emissions.
4. Minimize potential risks to aquatic organisms associated with exposure to inorganics in wetland surface water downgradient of LF-023.
5. Minimize infiltration of precipitation into landfilled waste materials.
6. Minimize potential for contaminant migration from waste materials.
7. Minimize erosion of existing cover soils.

Remedial response objectives 2 and 4 will be fully addressed in a separate FS, Proposed Plan, and ROD for groundwater, surface water, and sediment. This source

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control remedial action will address the following principal threats to human health and the environment posed by the site: (1) potential future human health risk from exposure to contaminants in site surface soil, and (2) potential effects to terrestrial wildlife from exposure to surface soil contaminants.

5.0 SUMMARY OF SITE CHARACTERISTICS

Subsection 1.4 of the Landfill LF-023 Source Control FS report contains an overview of the RI (ABB-ES, 1992a). The significant findings of the RI are summarized below. Concentrations and frequencies of detection of site contaminants in the various media at LF-023 are presented in Table 1. Figure 4 diagrams potential contaminant migration pathways and receptors.

5.1 WASTE/SOIL

Most of the landfill boundary is defined by large pine trees that predate landfill activities. The boundary was confirmed by a magnetometer survey. The areal extent of two small sections of the landfill, which are north of the main portion of landfill, was defined by a combination of a magnetometer survey and a ground-penetrating radar survey. The area of the landfill is estimated to be 438,000 square feet. The Preliminary Assessment indicated that wastes may have been buried as deep as 25 feet bgs in some areas. Observation during test pit excavation indicated that the landfill is at least 13 feet deep. The maximum volume of fill material is estimated to be 406,000 cubic yards, based on a reported maximum depth of 25 feet.

Test pits were dug during the SI to evaluate the nature of contamination in subsurface soil and buried waste. Material uncovered during test pitting indicates that the type of wastes disposed of at this site ranged from bagged household trash to construction debris and automobile parts. Site contaminants were not detected in subsurface soil; however one waste sample contained 1,2-dichlorobenzene.

A passive soil gas survey was conducted at LF-023 to identify areas of potential contamination and assist in identifying the location of future explorations. Areas of high flux values for some compounds were detected primarily along the dirt road that runs north-south through the site. However, results from subsequent groundwater and surface water sampling do not suggest the presence of contaminant "hot spots".

The site was divided into quadrants for surface soil sampling. Composite surface soil samples were collected from each quadrant and analyzed for semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), and inorganics. Discrete surface soil samples were collected from four locations and analyzed for volatile organic compounds (VOCs). The VOC sample locations were selected based

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on soil gas survey results. SVOCs (all of which were PAHs), silver, and PCBs (Aroclor 1254) were identified as site surface soil contaminants.

5.2 GROUNDWATER

Groundwater monitoring wells were installed at LF-023 to collect groundwater samples and to measure groundwater elevations. Groundwater at the site contains the following inorganics identified as site contaminants: aluminum, iron, manganese, and potassium. The VOCs detected include chloroform, vinyl chloride, chlorobenzene, benzene, ethylbenzene, and total xylenes. One SVOC, naphthalene, was also detected in one groundwater sample.

5.3 SURFACE WATER/SEDIMENT

Surface water and sediment samples were obtained at seeps approximately 600 feet south of the site to investigate the potential for contaminant transport via groundwater discharge. Aluminum, arsenic, iron, and zinc were detected in surface water at concentrations above Ambient Water Quality Criteria. No target compounds were identified as site contaminants in sediment samples; however, petroleum hydrocarbons (PHCs) were detected in sediment samples.

A complete discussion of site characteristics can be found in the RI report on pages 4-13 through 4-64 (ABB-ES, 1992a).

TABLE I
 LF-023 SITE CONTAMINANTS BY MEDIA
 LF-023 SOURCE CONTROL RECORD OF DECISION
 PLATTSBURGH AFB

DETECTION	CONCENTRATION RANGES ¹		FREQUENCY OF DETECTION
	MINIMUM	MAXIMUM	
<u>GROUNDWATER (µg/L)</u>			
<u>METALS</u>			
Aluminum	<200	662	2/16
Iron	<100	47,100	1/18
Manganese	<15	954	2/16
Potassium	<5,000	40,000	2/16
<u>VOCs</u>			
Chloroform	<0.2	0.4 ²	2/38
Vinyl Chloride	<0.3	31 ²	2/39
Chlorobenzene	<5	10	1/39
Benzene	<5	14	3/25
Ethylbenzene	<5	54	3/25
Xylenes (Total)	<5	72	4/25
<u>SVOCs</u>			
Naphthalene	<10	11	1/23
<u>SURFACE SOILS² (concentrations in µg/kg unless otherwise noted)</u>			
<u>SVOCs</u>			
Fluoranthene	<330	122,500	2/4
Naphthalene	<330	2,725	1/4
2-Methylnaphthalene	<330	2,125	1/4
Acenaphthene	<330	12,825	1/4
Dibenzofuran	<330	7,325	1/4
Phenanthrene	<330	144,000	1/4
Anthracene	<330	25,700	1/4
Pyrene	<330	105,500	2/4
Benzo(a)anthracene	<330	36,500	2/4
Chrysene	<330	35,000	1/4
Benzofluoranthene (Total)	<330	37,000	2/4
Benzo(a)pyrene	<330	21,200	2/4
Indeno (1,2,3-cd)pyrene	<330	4,650	1/4

continued

TABLE 1
 LF-023 SITE CONTAMINANTS BY MEDIA
 LF-023 SOURCE CONTROL RECORD OF DECISION
 PLATTSBURGH AFB

DETECTION	CONCENTRATION RANGE ¹		FREQUENCY OF DETECTION ²
	MINIMUM	MAXIMUM	
Dibenzo(a,h)anthracene	< 330	2,800	1/4
Fluorene	< 330	12,325	1/4
Benzo(g,h,i)perylene	< 330	3,350	1/4
PESTICIDES/PCBs			
PCB (Aroclor-1254)	< 160	190	1/4
METALS (mg/kg)			
Silver	< 2	12.8	2/4
SEDIMENT (mg/kg)			
PHCs	550	1,075	2/2
SURFACE WATER (ug/L)			
Aluminum	< 200	1990	1/2
Arsenic	< 10	316	1/2
Iron	< 100	672,000	2/2
Zinc	< 20	355	1/2
WASTE (ug/kg)			
SVOCs			
1,2-Dichlorobenzene	520	520	1/1

Notes:

- Concentrations of duplicate samples were averaged. When a compound was detected in one duplicate and not the other, an average concentration was calculated by using the detection limit, adjusted for dilution.
- Number of samples in which the compound was detected above background concentrations or appropriate standards divided by the total number of samples analyzed for that parameter. Duplicate samples were counted as one sample.
- Concentrations detected in composite samples.
- Concentrations reported from Method 8010 analyses.
- Concentrations reported from CLP-COP and Meth. 8010 analyses.

VOC Volatile Organic Compound
 SVOC Semivolatile Organic Compound
 PCB Polychlorinated Biphenyl
 PHC Petroleum Hydrocarbon

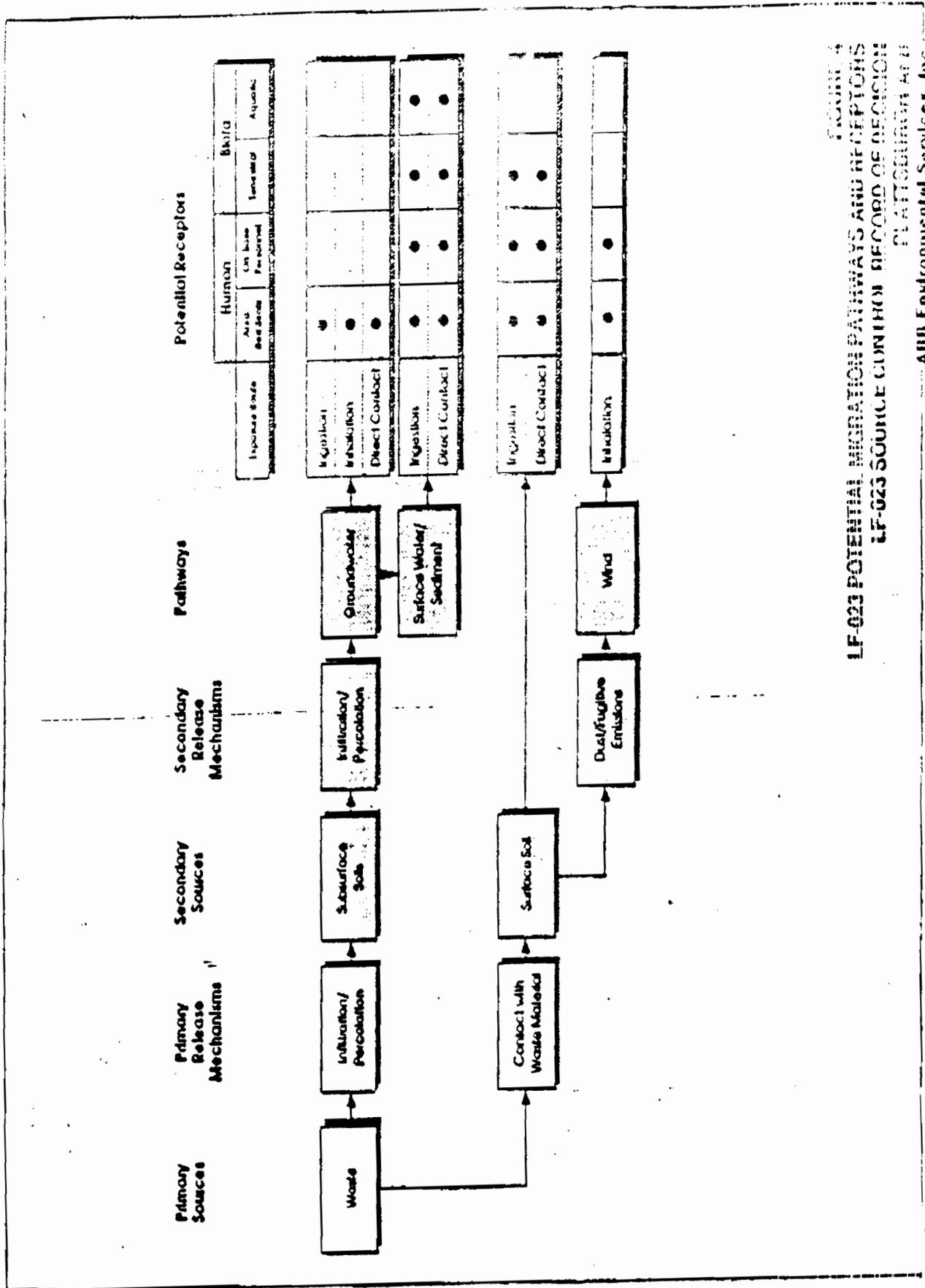


FIGURE 4
 LF-023 POTENTIAL MIGRATION PATHWAYS AND RECEPTORS
 LF-023 SOURCE CONTROL RECORD OF DECISION
 PLATTSMOUTH AND
 ABB Environmental Services, Inc.

6.0 SUMMARY OF SITE RISKS

A risk assessment was performed to estimate the probability and magnitude of potential adverse human health and environmental effects from exposure to contaminants associated with LF-023.

6.1 HUMAN HEALTH RISK ASSESSMENT

The human health risk assessment followed a four-step process: (1) data evaluation, that identified those hazardous substances that, given the specifics of the site, were of significant concern; (2) exposure assessment, which identified actual or potential exposure pathways, characterized the potentially exposed populations, and determined the extent of possible exposure; (3) toxicity assessment, which considered the types and magnitude of adverse health effects associated with exposure to hazardous substances; and (4) risk characterization, which integrated the three earlier steps to summarize the potential and actual risks posed by hazardous substances at the site, including carcinogenic and noncarcinogenic risks. The results of the human health risk assessment for LF-023 are discussed below, followed by the conclusions of the environmental risk assessment. The complete risk assessment for LF-023 can be found in Subsection 4.4 of the RI report, with supporting information in Appendices J, M, N, O, and P.

Thirty-two contaminants of concern were selected for evaluation in the risk assessment. These contaminants include all compounds identified as site contaminants at LF-023 during the RI, except PHCs (see Table 1). The 32 contaminants of concern were selected to represent potential site-related hazards based on toxicity, concentration, frequency of detection, and mobility and persistence in the environment; however, some contaminants were evaluated only in the human health risk assessment, while others were only evaluated in the environmental risk assessment. A summary of the health effects of each of the contaminants of concern can be found on pages 4-82 through 4-88 of the RI report. Toxicity profiles for each compound can be found in Appendix O of the RI report.

Potential human health effects associated with exposure to contaminants of concern were estimated quantitatively through the development of several hypothetical exposure pathways. These pathways were developed to reflect the potential for exposure to hazardous substances based on the present uses, potential future uses, and location of the site. The following is a brief summary of the exposure pathways

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evaluated. A more thorough description can be found on pages 4-69 through 4-30 of the RI report.

Eight exposure pathways were evaluated:

Current Site Conditions

1. Incidental ingestion of and direct contact with surface soil by a security policeman.
2. Incidental ingestion of and direct contact with surface soil by a child trespasser.
3. Incidental ingestion of and direct contact with surface water by a child trespasser.
4. Inhalation of vapors and fugitive dusts by a nearby resident.

Future Site Conditions

1. Ingestion of, direct contact with, and inhalation of volatile compounds from groundwater by a future resident.
2. Incidental ingestion of and direct contact with surface soil by a future resident.
3. Incidental ingestion of and direct contact with surface water by a future child resident.
4. Inhalation of vapors and fugitive dusts by a future resident.

Security police use the obstacle course 48 days per year (four days per week, 12 weeks per year) for four years (the average tour of duty). Because they may be exposed to the soil to a greater extent than a typical adult, an ingestion rate of 200 milligrams per day (mg/day) was assumed. Chemical concentrations were averaged over the four quadrants and chemical concentrations in the most contaminated quadrant were used to evaluate risks. Security police are more likely to be exposed to soil in the northeast quadrant (where the obstacle course is located), where silver is the only contaminant of concern detected in surface soils.

Dermal contact and incidental ingestion of soils were evaluated for a child trespasser between the ages of six and 16 years who may be exposed five days per year for the 10-year period. A future resident may also be exposed via this pathway. For the future resident scenario, it was assumed the child would be exposed through childhood and into adulthood. The exposure scenario was evaluated for a child between the ages of one and six years, and an older child/adult between the ages of seven and 30 years. Exposure was assumed to occur 175 days per year for a total of 30 years.

Children between the ages of six and 16 years may also be exposed to surface water in the wetland south of LE-023. Dermal contact and incidental ingestion of surface water was evaluated for a child trespasser five days per year for one hour per day for the 10-year period. Similarly, a future child resident could explore the wetland and be exposed to contaminants there. An exposure frequency of 26 days per year was assumed for the future child resident because access would likely be easier than for a child trespasser.

The inhalation pathway was evaluated for current residents of the mobile home park 600 feet southwest of the site, as well as future residents living on the site. For this pathway, a model was used to predict ambient air concentrations at the nearest residence (200 meters away for the current scenario and 1 meter away for the future scenario). Exposure was evaluated for a resident who may spend 16 hours per day for 175 days per year breathing the predicted air concentrations. This pathway was assumed for a child resident (one to six years old) and adult residents (30-year exposure duration).

Groundwater at the site is not currently used, however, a future resident could be exposed to groundwater via ingestion of the water, dermal absorption during showering or bathing, and inhalation of volatile compounds during showering. These pathways were evaluated together because a future resident could be exposed via all three pathways. Most of the exposure parameters used were default values established by USEPA. Maximum detected concentrations in groundwater were assumed. Air concentrations were calculated using partitioning equations (see Appendix P of the RI report).

Excess lifetime cancer risks were determined for each exposure pathway by multiplying the exposure level with the chemical-specific cancer slope factor. Cancer slope factors have been developed by USEPA from epidemiological or animal studies to reflect a conservative "upper bound" of the risk posed by potentially carcinogenic

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compounds. That is, the true risk is very unlikely to be greater than the predicted risk. The resulting risk estimates are expressed in scientific notation as a probability (e.g., 1×10^{-6} for 1/1,000,000) and indicate (using this example) that an individual is not likely to have greater than a one-in-a-million chance of developing cancer over 70 years as a result of site-related exposure (as defined) to the compound at the stated concentration. Current USEPA practice considers carcinogenic risks to be additive when assessing exposure to a mixture of hazardous substances.

The Hazard Index was also calculated for each pathway as USEPA's measure of the potential for noncarcinogenic health effects. The Hazard Index is the sum of Hazard Quotients, which are calculated by dividing the exposure level by the reference dose (RfD) or other suitable benchmark for noncarcinogenic health effects for each compound. RfDs have been developed by USEPA to protect sensitive individuals over the course of a lifetime, and reflect daily exposure levels that are unlikely to have an appreciable risk of an adverse health effect. RfDs are derived from epidemiological or animal studies and incorporate uncertainty factors to help ensure that adverse health effects will not occur. The Hazard Index is often expressed as a single value (e.g., 0.3) indicating the ratio of the stated exposure as defined to the RfD (in this example, the exposure as characterized is approximately one-third of an acceptable exposure level for the given compound). The Hazard Index is only considered additive for compounds that have the same or similar toxic endpoints (e.g., the Hazard Index for a compound known to produce liver damage should not be added to a second whose toxic endpoint is kidney damage).

Tables 2, 3, and 4 depict the carcinogenic and noncarcinogenic risk summaries for current and potential future receptors for the exposure pathways described above. Human health risk calculations can be found in Appendix N of the RI.

All current human health risks were estimated to be below or within the acceptable limits established by USEPA (i.e., carcinogenic risks below or within 10^{-4} and 10^{-5} and noncarcinogenic effects with a Hazard Index of below or equal to 1.0). Three potential future human health risks were estimated to be above acceptable limits. Evaluation of ingestion, direct contact, and inhalation of VOCs in groundwater yielded a risk estimate of 7×10^{-4} . Ninety-eight percent of the total cancer risks via the three exposure pathways are attributable to vinyl chloride. Average and maximum cancer risks for both future child and adult residents via direct contact and incidental ingestion are above acceptable limits. Essentially 100 percent of these risks are attributable to carcinogenic PAHs. Carcinogenic and noncarcinogenic risks

estimated for a future child resident via inhalation of vapors and dusts from the landfill above acceptable limits.

The interpretation of these risk estimates is subject to a number of uncertainties as a result of the multiple layers of assumptions inherent in risk assessment. Many of these assumptions are intended to be protective of human health (i.e., conservative). Therefore, risk estimates are not truly probabilistic estimates of risk, but rather conditional estimates given a series of conservative assumptions about exposure and toxicity. Further information on the uncertainty of risk estimates can be found on pages 4-97 through 4-100 in the RI report.

6.2 ENVIRONMENTAL RISK ASSESSMENT

A habitat-based environmental risk assessment (ERA) was performed for LF-023. Terrestrial wildlife could be exposed to surface soil at the landfill and groundwater seeps in the wetland south of the landfill. There are no aquatic habitats on site, and the wetland to the south is not expected to support fish because standing water is not present throughout the year. However, aquatic invertebrates may live in the wetland and could be exposed to chemicals in the surface water. Selection of aquatic receptors and modeling of exposures was not necessary because chemical concentrations could be compared directly to water quality criteria.

Chronic and acute Hazard Indices for each indicator species exposed to surface soil were between 10^{-5} and 10^{+0} , indicating that effects to individuals may occur, but population effects are unlikely. Effects to terrestrial organisms as a result of exposure to contaminants in the wetland are not likely, based on Hazard Indices between 10^{-3} and 10^{-2} . However, acute and chronic toxicity to aquatic organisms in the wetland may be occurring because the Hazard Indices calculated for this exposure were between 1 and 10.

The ERA for LF-023 is presented on pages 4-100 through 4-111 and Appendix J of the RI report.

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to human health and welfare, and the environment. The following risks must be addressed through this or subsequent remedial activities:

- (1) potential future human health risks via exposure to vinyl chloride in groundwater,
- (2) potential future human health risks via exposure to carcinogenic PAHs in site

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surface soil, (3) potential future human health risks via inhalation of vapor and dusts from landfill surface soil, (4) potential environmental risks to terrestrial wildlife via exposure to surface soils, and (5) potential environmental risks to aquatic organisms in the wetland. As stated, this ROD addresses risks associated with landfill surface soils. Mitigation of risks associated with groundwater and surface water and sediment in the downgradient wetland will be addressed in a separate ROD.

TABLE 2
SUMMARY OF LF-023 SITE RISK ESTIMATES - SECURITY POLICE

LF-023 SOURCE CONTROL RECORD OF DECISION
PLATTSBURGH AFB

TYPE OF EFFECT	EXPOSURE ROUTE, MEDIUM AND EXPOSURE POINT	PATHWAY-SPECIFIC CANCER RISK OR HAZARD INDEX	TOTAL CANCER RISK OR HAZARD INDEX
CARCINOGENIC EFFECTS			
Site-wide Average	Direct contact with surface soil	8E-05	9E-05
	Ingestion of surface soil	1E-05	
Southeast Quadrant	Direct contact with surface soil	3E-04	3E-04
	Ingestion of surface soil	4E-05	
NONCARCINOGENIC EFFECTS			
Site-wide Average	Direct contact with surface soil	0.06	0.07
	Ingestion of surface soil	0.01	
Southeast Quadrant	Direct contact with surface soil	0.3	0.3
	Ingestion of surface soil	0.05	

TABLE 3
SUMMARY OF LF-023 SITE RISK ESTIMATES - CHILD TRESPASSER

LF-023 SOURCE CONTROL RECORD OF DECISION
PLATTSBURGH AFB

TYPE OF EFFECT	EXPOSURE ROUTE, MEDIUM AND EXPOSURE POINT	PATHWAY-SPECIFIC CANCER RISK OR HAZARD INDEX	TOTAL CANCER RISK OR HAZARD INDEX
CARCINOGENIC EFFECTS			
Site-wide Average	Direct contact with surface soil	5E-06	9E-06
	Ingestion of surface soil	3E-06	
Southeast Quadrant	Direct contact with surface soil	2E-05	3E-05
	Ingestion of surface soil	1E-05	
	Incidental ingestion of surface water	1E-06	1E-06
	Direct contact with surface water	3E-08	
		Total - Site-wide Average	1E-05
		Total - Southeast Quadrant	3E-05
NONCARCINOGENIC EFFECTS			
Site-wide Average	Direct contact with surface soil	0.002	0.003
	Ingestion of surface soil	0.001	
Southeast Quadrant	Direct contact with surface soil	0.01	0.01
	Ingestion of surface soil	0.003	
	Incidental ingestion of surface water	0.005	0.006
	Direct contact with surface water	0.0001	
		Total - Site-wide Average	0.006
		Total - Southeast Quadrant	0.02

TABLE 4
SUMMARY OF LF-023 SITE RISK ESTIMATES - FUTURE RESIDENT

LF-023 SOURCE CONTROL RECORD OF DECISION
PLATTSBURGH AFB

TYPE OF EFFECT	EXPOSURE ROUTE, MEDIUM AND EXPOSURE POINT	PATHWAY-SPECIFIC CANCER RISK OR HAZARD INDEX		TOTAL CANCER RISK OR HAZARD INDEX	
		CHILD	ADULT	CHILD	ADULT
CARCINOGENIC EFFECTS					
	Direct contact with groundwater	4E-07	1E-06		
	Ingestion of groundwater	9E-04	7E-04		
	Inhalation of volatiles - showering	5E-05	4E-05	7E-04	7E-04
Site-wide Average	Direct contact with surface soil	4E-04	8E-04		
	Ingestion of surface soil	3E-04	1E-04	7E-04	7E-04
Northwest Quadrant	Direct contact with surface soil	1E-03	2E-03		
	Ingestion of surface soil	1E-03	3E-04	2E-03	3E-03
	Incidental ingestion of surface water	2E-07			
	Direct contact with surface water	7E-06		8E-06	
	Inhalation of vapors and dusts	2E-04	1E-04	2E-04	1E-04
	Total: Site-wide Average			2E-03	2E-03
	Total: Northwest Quadrant			3E-03	4E-03
	Total: Site-wide Average			3E-03	
	Total: Southeast Quadrant			3E-03	
NONCARCINOGENIC EFFECTS					
	Direct contact with groundwater	0.003	0.002		
	Ingestion of groundwater	0.9	0.2		
	Inhalation of volatiles - showering	0.3	0.06	1.2	0.3
Site-wide Average	Direct contact with surface soil	0.2	0.08		
	Ingestion of surface soil	0.2	0.02	0.4	0.1
Northwest Quadrant	Direct contact with surface soil	0.8	0.4		
	Ingestion of surface soil	1	0.09	2	0.5
	Incidental ingestion of surface water	0.0007			
	Direct contact with surface water	0.03		0.03	
	Inhalation of vapors and dusts	5	0.8	5	0.8
	Total: Site-wide Average			7	1
	Total: Northwest Quadrant			8	2

7.0 DEVELOPMENT AND SCREENING OF ALTERNATIVES

7.1 STATUTORY REQUIREMENTS/RESPONSE OBJECTIVES

The primary goal at NPL sites is to undertake remedial actions that are protective of human health and the environment. Section 121 of CERCLA establishes several other statutory requirements and preferences, including: a requirement that the remedial action, when complete, must comply with all federal and more stringent state environmental standards, requirements, criteria or limitations, unless a waiver is invoked; a requirement that the selected remedial action is cost-effective and uses permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and a preference for remedies in which treatment that permanently and significantly reduces the toxicity, mobility, or volume of hazardous substances is a principal element over remedies not involving such treatment. LF-023 source control alternatives were developed to be consistent with these Congressional mandates.

Based on the types of contaminants, environmental media of concern, and potential exposure pathways, remedial response objectives were developed to aid in the development and screening of alternatives. These remedial response objectives were developed to mitigate existing and future potential threats to human health and the environment:

1. Minimize potential future human health and current and future ecological risks associated with exposure to surface soil contaminants (primarily PAHs).
2. Minimize potential future human health risks associated with exposure to vinyl chloride in groundwater.
3. Minimize potential future human health risks associated with exposure to PAHs in dust emissions.
4. Minimize potential risks to aquatic organisms associated with exposure to aluminum, arsenic, and zinc in wetland surface water downgradient of LF-023.
5. Minimize infiltration of precipitation into landfilled waste materials.

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6. Minimize potential for contaminant migration from waste materials
7. Minimize erosion of existing cover soils.

Remedial response objectives 2 and 4 will be fully addressed in a separate FS, Proposed Plan, and ROD for groundwater, surface water, and sediment.

7.2 TECHNOLOGY AND ALTERNATIVE DEVELOPMENT AND SCREENING

CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) set forth the process by which remedial actions are evaluated and selected (USEPA, 1990a). In accordance with these requirements, a range of alternatives was developed for the site. With respect to source control, the RI/FS developed a limited number of remedial alternatives appropriate for large landfill sites, focusing on attaining response objectives for source control and mitigating risks associated with potential exposure to surface soils. A No Action Alternative was also developed to provide a baseline for comparison against the other alternatives.

As discussed in Subsection 4.1 of the LF-023 Source Control FS (ABB-ES, 1992b), the RI/FS identified, assessed, and screened technologies based on the approach outlined in the NCP and USEPA's *Streamlining the RI/FS for CERCLA Municipal Landfill Sites* (USEPA, 1990b). Subsection 4.2 of the FS presents the remedial alternatives developed by combining the technologies retained from the screening process in the categories identified in Section 300.430(e)(3) of the NCP. Technologies were combined into source control alternatives ranging from an alternative that eliminates the need for long-term management by removing or destroying contaminants to the maximum extent feasible, to alternatives that provide no treatment but do protect human health and the environment. Section 5.0 of the FS presents the initial screening of LF-023 alternatives. The purpose of the initial screening was to narrow the number of potential remedial actions for detailed analysis while preserving a range of options. Each alternative was evaluated and screened based on its effectiveness, implementability, and cost.

In summary, of the five source control remedial alternatives screened in Section 5.0 of the FS, three were retained for detailed analysis. Table 5 identifies the alternatives that were retained through the screening process, as well as those that were eliminated from further consideration.

TABLE 5
 SUMMARY OF ALTERNATIVES SCREENING
 LF-023 SOURCE CONTROL RECORD OF DECISION
 PLATTSBURGH AFB

ALTERNATIVE	STATUS
Alternative 1: No Action	Retained for detailed analysis.
Alternative 2: Site Grading and Vegetation Establishment	Retained for detailed analysis.
Alternative 3: Installation of a Low-Permeability Barrier Cover System	Retained for detailed analysis.
Alternative 4: Excavation and Incineration	Eliminated from further consideration.
Alternative 5: Stabilization/Solidification	Eliminated from further consideration.

8.0 DESCRIPTION OF ALTERNATIVES

This section provides a narrative summary of each alternative evaluated. A detailed description of each alternative can be found in Section 6.0 of the FS report.

The source control alternatives analyzed for LF-023 include Alternative 1: No Action, Alternative 2: Site Grading and Vegetation Establishment for Closure, and Alternative 3: Installation of a Low-permeability Barrier Cover System.

8.1 ALTERNATIVE 1: NO ACTION

The No Action Alternative (Alternative 1) provides a baseline against which the other alternatives can be compared, and also assesses the effects on human health and the environment if no remedial actions are taken. The No Action Alternative includes a program to monitor the status of groundwater and surface water quality, with five-year reviews to evaluate how human health and the environment are protected. This monitoring program would meet the relevant and appropriate requirements of Part 360 of the New York State Solid Waste Management Facility Rules for closure and post-closure of solid waste landfills (hereinafter referred to as Part 360) requirements for long-term monitoring. The No Action Alternative would not meet the remedial response objectives.

Estimated Time for Construction (installation of a groundwater monitoring well): 3 days

Estimated Time of Operation: 30 years

Estimated Capital Cost: \$9,000

Estimated Operation and Maintenance (O&M) Costs (30 years, net present worth assuming a 10 percent discount factor): \$784,000

Estimated Total Costs (30 years, net present worth assuming a 10 percent discount factor): \$793,000

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8.2 ALTERNATIVE 2: SITE GRADING AND VEGETATION ESTABLISHMENT FOR CLOSURE

This alternative (Alternative 2) consists of a soil cover (i.e., no low-permeability layer) to support grass growth and reduce precipitation infiltrating to buried wastes. The alternative includes:

1. Clearing and grubbing of the site.
2. Surface water runoff management to minimize erosion of the cover and minimize maintenance requirements.
3. Soil cover installation.
4. Vegetation establishment to minimize erosion of the final cover and enhance evapotranspiration.
5. Post-closure plan development to monitor, maintain, and inspect the site.
6. Groundwater and surface water monitoring.
7. Five-year site reviews.

This alternative would only slightly reduce the infiltration of precipitation through the wastes from current levels, and therefore would not minimize the potential for contaminant migration from wastes to groundwater.

Estimated Time for Construction: 3 months

Estimated Time of Operation: 30 years

Estimated Capital Cost: \$987,000

Estimated O&M Costs (30 years, net present worth assuming a 10 percent discount factor): \$988,000

Estimated Total Costs (30 years, net present worth assuming a 10 percent discount factor): \$1,975,000

8.3 ALTERNATIVE 3: INSTALLATION OF A LOW-PERMEABILITY BARRIER COVER SYSTEM

Alternative 3 consists of a low-permeability cover system to achieve the response objectives identified in Section 7.0. The alternative includes:

1. Clearing and grubbing of the site.
2. Surface water runoff management to minimize erosion of the cover and minimize maintenance requirements.
3. Installation of a gas detection and management system.
4. Construction of a barrier layer.
5. Placement of a barrier protection layer.
6. Installation of a vegetative cover layer.
7. Vegetation establishment to minimize erosion of the final cover and enhance evapotranspiration.
8. Post-closure plan development to monitor, maintain, and inspect the site.
9. Groundwater and surface water monitoring.
10. Five-year site reviews.

This alternative would greatly reduce both infiltration of precipitation through the wastes, and minimize the potential for contaminant migration from wastes to groundwater. This alternative would meet the source control response objectives.

Estimated Time for Construction: 4 months

Estimated Time of Operation: 30 years

Estimated Capital Cost: \$3,586,000

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Estimated O&M Costs (30 years, net present worth assuming a 10 percent discount factor): \$988,000

Estimated Total Costs (30 years, net present worth assuming a 10 percent discount factor): \$4,574,000

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- **Reduction of toxicity, mobility, or volume through treatment** addresses the degree to which alternatives employ recycling or treatment that reduces toxicity, mobility, or volume, including how treatment is used to address the principal threats posed by the site.
- **Short-term effectiveness** addresses time needed to achieve protection and any adverse impacts on human health and the environment.
- **Implementability** addresses the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.
- **Cost** includes estimated capital and O&M costs, as well as present-worth costs.

9.3 MODIFYING CRITERIA

The modifying criteria are used on the final evaluation of remedial alternatives after Plattsburgh AFB has received public comment on the RI/FS and Proposed Plan.

- **State acceptance** addresses New York State's position and key concerns related to the preferred alternative and other alternatives, and New York State's comments on ARARs or the proposed use of waivers.
- **Community acceptance** addresses the public's general response to the alternatives described in the Proposed Plan and RI/FS report.

9.4 CRITERIA SUMMARY

A detailed tabular assessment of each alternative according to the nine criteria can be found in Tables 6-4, 6-7, and 6-9 of the FS report (ABB-ES, 1992b).

Following the detailed analysis of each individual alternative, a comparative analysis, focusing on the relative performance of each alternative against the nine criteria, was conducted. This comparative analysis can be found in Table 7-1 of the FS report.

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because treatment would not be employed as a principal element. Treatment is a statutory preference under CERCLA; however, cover systems are often more appropriate for landfill sites such as LF-023.

9.4.5 Short-term Effectiveness

Short-term impacts are not anticipated for Alternative 1 because no remedial actions would be implemented. Alternatives 2 and 3 would result in similar direct short-term impacts to potential ecological receptors from clearing and grubbing activities.

9.4.6 Implementability

The implementability of Alternatives 2 and 3 would be similar; however, a suitable borrow source for the low-permeability hydraulic barrier material must be identified before implementation of Alternative 3, unless a synthetic liner is used instead. Alternative 1 would be readily implementable because no remedial actions would be conducted.

9.4.7 Cost

Alternative 1 would be the least expensive because it would involve no remedial actions. Alternative 3 would be the most costly of the two cover system alternatives; however, the increased cost is associated primarily with the hydraulic barrier cover materials.

9.4.8 State Acceptance

The State Acceptance criterion has been addressed by incorporating comments received from NYSDEC on behalf of the state on the Proposed Plan. The state has had the opportunity to review and comment on all documents produced for LF-023. New York State concurs with the selected remedy for LF-023 source control (see Appendix B).

9.4.9 Community Acceptance

Plattsburgh AFB has not received public comment on the LF-022 Proposed Plan. If the public had commented on the Proposed Plan, the comments would have been addressed in the Responsiveness Summary attached as an appendix to this ROD.

10.0 THE SELECTED REMEDY

Plattsburgh AFB has chosen Alternative 3 as the selected remedy for LF-023 because it addresses source control response objectives for LF-023. Response objectives for groundwater, surface water, and sediment contamination will be addressed further in a separate FS, Proposed Plan, and ROD. Source remediation at LF-023 will be consistent with future groundwater remedies and will mitigate releases of hazardous substances from the former landfill to groundwater.

10.1 CLEANUP LEVELS

Cleanup levels have not been established for the surface soil contaminants of concern (primarily PAHs). Chemical-specific ARARs are not available for contaminants in soil. In the absence of a chemical-specific ARAR, or other suitable criteria to be considered (TBC), a 10^{-6} excess cancer risk level for carcinogenic effects or a concentration corresponding to a Hazard Index of 1.0 for compounds with noncarcinogenic effects is typically used to set cleanup levels. Risk-based target cleanup levels were not developed for LF-023 source control because discrete source areas (i.e., hot spots) were not found. Remedial alternatives developed for LF-023 included containment options to address the entire landfill area and treatment options to address all landfilled soil and waste. These alternatives were developed to address mitigation of surface soil risks and the potential for contaminants leaching to groundwater. The Hydrologic Evaluation of Landfill Performance (HELP) model was used to evaluate expected performance (i.e., amount of water that can percolate through the waste) of the three alternatives. HELP model results were used to calculate dilution factors for the shallow LF-023 aquifer for two scenarios (i.e., Alternatives 1 and 3). Based on this analysis, a 2.7-fold improvement in downgradient groundwater quality is expected for Alternative 3 over baseline conditions.

Cleanup levels for other contaminated media associated with the site will be developed in the FS for groundwater, surface water, and sediment, if appropriate.

Periodic assessments of the protection afforded by remedial actions (i.e., five-year site reviews) will be made as the remedy is being implemented and at the completion of the remedial action. If the source control remedial action is not found to be protective, further action will be required.

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10.2 DESCRIPTION OF REMEDIAL COMPONENTS

The Installation of a Low-permeability Barrier Cover System (i.e., Alternative 3) consists primarily of a low-permeability cover system to achieve the response objectives identified in Section 7.0 of this document.

Existing vegetation such as trees and brush would be cleared, grubbed, and removed from the site. The cleared site would be regraded to control rainwater runoff and minimize erosion. The installation of a gas detection system around the landfill would be used to monitor for the presence or migration of methane and other landfill gases after closure of LF-023. A gas management system also would be part of the landfill cover including venting pipes between a gas-venting soil layer and the cover system surface.

The cover's barrier layer would be constructed of a synthetic liner to keep rainwater or snowmelt from infiltrating the landfill. The low-permeability barrier layer is covered by a soil barrier protection layer to protect the barrier layer from frost or root penetration. The additional soil over the barrier layer will provide an area for small plants to root. However, large plants requiring deeper soil for their root systems will not be allowed to grow over the barrier cover in order to prevent root penetration into the synthetic liner. Six inches of topsoil would be placed on top of the barrier protection layer to plant grass, which will minimize soil erosion and enhance evapotranspiration.

A post-closure plan will be developed specifying the inspection, monitoring and maintenance programs for the closed landfill to be continued for 30 years. These post-closure activities will be subject to five-year site reviews as required by the NCP when contaminants remain at the site. In addition, institutional controls for this site will be incorporated into the Plattsburgh AFB Comprehensive Plan. This will ensure that future owners will be made aware of the landfill location and are informed that the integrity of the final covers, liners, or any other component of the containment or monitoring system must not be compromised.

11.0 STATUTORY DETERMINATIONS

The remedial action selected for implementation at LF-023 is consistent with CERCLA and, to the extent practicable, the NCP. The selected remedy is protective of human health and the environment, attains ARARs, and is cost-effective. The selected remedy uses permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable for this site. However, it (as well as the other alternatives evaluated) does not satisfy the statutory preference for a treatment which permanently and significantly reduces the toxicity, mobility, or volume of hazardous substances as a principal element.

11.1 THE SELECTED REMEDY IS PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT

The remedy at LF-023 will permanently reduce the risks posed to human health and the environment by eliminating, reducing, or controlling exposures to human and environmental receptors through engineering controls (i.e., low-permeability barrier cover system). Moreover, the selected remedy will minimize infiltration of precipitation into landfilled waste material and minimize the potential for contaminant migration from waste materials. Finally, implementation of the selected remedy will not pose unacceptable short-term risks or cross-media impacts because the selected remedy includes elements to mitigate potential impacts (e.g., erosion control measures, gas detection and management, and maintenance and monitoring programs).

11.2 THE SELECTED REMEDY ATTAINS ARARs

This remedy will attain all federal and state requirements that apply or are relevant and appropriate to the site and selected source control remedy. ARARs that pertain to groundwater, surface water, and sediment will be identified for these media in separate FS and ROD documents, and selected remedies for those media will be required to comply with ARARs. Environmental laws from which ARARs for the selected source control remedial action are derived, and the specific ARARs are listed below.

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Applicable or Relevant and Appropriate Requirements:

Location-specific:

- Fish and Wildlife Coordination Act (16 U.S.C. 661, et seq.), relevant and appropriate because of the regulated wetland downgradient of LF-023.
- National Environmental Policy Act (40 CFR Part 6), Appendix A (except for floodplain requirements), relevant and appropriate because of the regulated wetland downgradient of LF-023.
- Clean Water Act, Section 404, relevant and appropriate because of the regulated wetland downgradient of LF-023.
- NYSDEC Freshwater Wetlands Regulations (6 NYCRR Parts 662 through 665), relevant and appropriate because of the regulated wetland downgradient of LF-023.

Chemical-specific:

No federal or state chemical-specific ARARs have been promulgated for contaminants in soil. However, the following chemical-specific ARARs and guidelines pertain to potential air emissions resulting from construction activity at the site:

- Clean Air Act (40 CFR Part 50), applicable for particulate matter (e.g., fugitive dusts) entrained in air during clearing, grading, cover system construction activities.
- NYSDEC Ambient Air Quality Standards (6 NYCRR Part 257), applicable for particulate matter (e.g., fugitive dusts) entrained in air during clearing, grading, cover system construction activities.

Action-specific:

- NYSDEC Solid Waste Management Facility Rules (6 NYCRR Part 360), applicable to solid waste landfills, specifies closure and post-closure criteria.

- Fish and Wildlife Coordination Act (16 U.S.C. 661, et seq.), relevant and appropriate because of the regulated wetland downgradient of LF-023.
- National Environmental Policy Act (40 CFR Part 6), Appendix A (except for floodplain requirements) is relevant and appropriate because of the regulated wetland downgradient of LF-023.
- Clean Water Act, Section 404, relevant and appropriate because of the regulated wetland downgradient of LF-023.
- Clean Air Act (40 CFR Part 50), applicable for particulate matter (e.g., fugitive dusts) entrained in air during clearing, grading, cover system construction activities.
- Occupational Safety and Health Administration Regulations (29 CFR Parts 1904, 1910, and 1916), applicable for all work conducted on site.
- NYSDEC Freshwater Wetlands Regulations (6 NYCRR Parts 662 through 665), relevant and appropriate because of the regulated wetland downgradient of LF-023.
- NYSDEC Use and Protection of Waters, Excavation, and Placement of Fill in Navigable Water (6 NYCRR Section 608.4), relevant and appropriate because of the regulated wetland downgradient of LF-023.
- NYSDEC Division of Air Resources Regulations (6 NYCRR Parts 200-202, 257), applicable for particulate matter (e.g., fugitive dusts) entrained in air during clearing, grading, cover system construction activities, and emissions from landfill gas vents.
- New York State Air Pollution Control Regulations (6 NYCRR Chapter 3, Part 212), applicable if pollution control equipment is required as part of the gas management system.

A more detailed discussion of why these requirements are applicable or relevant and appropriate may be found in the FS report on pages 3-1 through 3-8 and 4-9 through 4-16. Within these pages of the FS report, other laws that are not applicable or

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relevant and appropriate to this site are discussed and the rationale for their exclusion as ARARs is presented.

Federal and State Nonregulatory Criteria:

In addition to the federal and state ARARs, federal and state non-promulgated advisories or guidance may be considered when ARARs for specific contaminants are not available. The following policies, criteria, and guidance (i.e., TBCs) were considered:

- New York Air Guide - 1, Guidelines for the Control of Toxic Ambient Air Contaminants, guidance to be considered for landfill gas management.
- USEPA Health Advisories, USEPA RfDs, and USEPA Human Health Assessment Group Cancer Slope Factors, criteria used in the preparation of the baseline risk assessment for LF-023.

11.3 THE SELECTED REMEDIAL ACTION IS COST-EFFECTIVE

In Plattsburgh AFB's judgment, the selected remedy is cost-effective (i.e., the remedy affords overall effectiveness proportional to its costs). In selecting this remedy, once Plattsburgh AFB identified alternatives that are protective of human health and the environment and that attain ARARs, Plattsburgh AFB evaluated the overall effectiveness of each alternative by assessing the relevant three criteria: long-term effectiveness and permanence; reduction in toxicity, mobility, or volume through treatment; and short-term effectiveness, in combination. The relationship of the overall effectiveness of this remedial alternative was determined to be proportional to its costs. The costs of this remedial alternative are:

Estimated Capital Cost: \$3,586,000

Estimated O&M Costs (30 years, net present worth assuming a 10 percent discount factor): \$988,000

Estimated Total Costs (30 years, net present worth assuming a 10 percent discount factor): \$4,574,000

SECTION 11

The selected alternative complies with state regulations governing closure and post-closure of solid waste landfills, and NYSDEC has had the opportunity to review and comment on all documents produced for LF-023. State and public comments received on LF-023 Source Control to date have been incorporated into this ROD for the site.

11.5 THE SELECTED REMEDY DOES NOT SATISFY THE PREFERENCE FOR TREATMENT THAT PERMANENTLY AND SIGNIFICANTLY REDUCES THE TOXICITY, MOBILITY, OR VOLUME OF THE HAZARDOUS SUBSTANCES AS A PRINCIPAL ELEMENT

Because treatment of the principal threats at the site was not found to be practicable, this remedy does not satisfy the statutory preference for treatment as a principal element of the remedy. Treatment technologies were considered during the identification of remedial technologies and the development and initial screening of alternatives, but were considered to be infeasible for the LF-023 landfill site. The size of the landfill and the fact that there are no on-site hot spots representing the major sources of contamination preclude a remedy in which contaminants could be excavated and treated effectively. The FS report to be prepared for other site media (i.e., groundwater, surface water, and sediment) will consider treatment options if cleanup goals are appropriate for those media.

12.0 DOCUMENTATION OF NO SIGNIFICANT CHANGES

Plattsburgh AFB presented a Draft Final Source Control Proposed Plan for the preferred alternative for remediation of LF-023 in August 1992. The preferred alternative for source control included:

1. Clearing and grubbing of the site.
2. Surface water runoff management to minimize erosion of the cover and minimize maintenance requirements.
3. Installation of a gas detection and management system.
4. Construction of a barrier layer.
5. Placement of a barrier protection layer.
6. Installation of a vegetative cover layer.
7. Vegetation establishment to minimize erosion of the final cover and enhance evapotranspiration.
8. Post-closure plan development to monitor, maintain, and inspect the site.
9. Groundwater and surface water monitoring.
10. Five-year site reviews.

The chosen remedial action does not differ from the preferred alternative presented in the Proposed Plan.

13.0 REGULATORY ROLE

The EPA and NYSDEC have reviewed the various alternatives and have indicated their support for the selected remedy. The EPA and NYSDEC have also reviewed the RI, risk assessment, and FS to determine if the selected remedy is in compliance with applicable or relevant and appropriate federal and New York State environmental laws and regulations. The EPA and NYSDEC concur with the selected remedy for LF-023 source control. The EPA indicates its concurrence with the LF-023 source control ROD by cosigning the document with Plattsburgh AFB. A copy of the NYSDEC declaration of concurrence is attached as Appendix B.

REFERENCES

- ABB Environmental Services, Inc. (ABB-ES), 1992a. "Installation Restoration Program (Remedial Investigation/Feasibility Study) at Plattsburgh Air Force Base, New York; Final Landfills LF-022/LF-023 Remedial Investigation Report"; Portland, Maine; February.
- ABB Environmental Services, Inc. (ABB-ES), 1992b. "Installation Restoration Program (Remedial Investigation/Feasibility Study) at Plattsburgh Air Force Base, New York; Draft Final Landfill LF-023 Source Control Feasibility Study Report"; Portland, Maine; March.
- U.S. Environmental Protection Agency (USEPA), 1990a. "National Oil and Hazardous Substances Pollution Contingency Plan;" 40 CFR Part 300; Washington, D.C.; March 8.
- U.S. Environmental Protection Agency (USEPA), 1990b. "Streamlining the RI/FS for CERCLA Municipal Landfill Sites"; Office of Emergency and Remedial Response Hazardous Site Control Division; Washington, D.C.; September

ACRONYMS

ABB-ES	ABB Environmental Services, Inc.
AFB	Air Force Base
ARAR	Applicable or Relevant and Appropriate Requirement
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (the Superfund statute)
DERP	Defense Environmental Restoration Program
DOE	Department of Energy
ERA	environmental risk assessment
FS	Feasibility Study
HELP	Hydrologic Evaluation of Landfill Performance
LAG	Interagency Agreement
IRP	Installation Restoration Program
mg/day	milligrams per day
MMES	Martin Marietta Energy Systems, Inc.
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
NYSDEC	New York State Department of Environmental Conservation
O&M	operation and maintenance
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PHC	petroleum hydrocarbon
RfD	risk reference dose
RI	Remedial Investigation
ROD	Record of Decision
SAC	Strategic Air Command

ACRONYMS

SARA	Superfund Amendments Reauthorization Act
SI	site inspection
SVOC	semivolatile organic compound
TBC	to be considered
TRC	Technical Review Committee
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound

APPENDIX A - ADMINISTRATIVE RECORD INDEX