



Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision
Dewey Loeffel Site
Operable Unit 2
Town of Nassau, Rensselaer County
Site Number 4-42-006

January 2001

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* JOHN P. CAHILL, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

Dewey Loeffel Inactive Hazardous Waste Site Operable Unit 2 Town of Nassau, Rensselaer County, New York Site No. 442006

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedy for the Operable Unit 2 of the Dewey Loeffel class 2 inactive hazardous waste disposal site which was chosen in accordance with the New York State Environmental Conservation Law. The remedial program selected is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300).

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for Operable Unit 2 of the Dewey Loeffel inactive hazardous waste site and upon public input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

Actual or threatened release of hazardous waste constituents from this site, if not addressed by implementing the response action selected in this ROD, presents a current or potential significant threat to public health and the environment.

Description of Selected Remedy

Based on the results of the Remedial Investigation/Feasibility Study (RI/FS) for Operable Unit 2 of the Dewey Loeffel site and the criteria identified for evaluation of alternatives, the NYSDEC has selected Alternative 9, Disposal Site Hydraulic Containment with Downgradient Groundwater Recovery and Treatment. The elements of the selected remedy are

- installation within the landfill of an upgraded leachate collection system, intended to eliminate the disposal site as an ongoing source of groundwater contamination by achieving hydraulic containment of the leachate and groundwater associated with the disposal site;

- installation of groundwater extraction wells between the landfill and the residential wells to the south of the site. These recovery wells are intended to accelerate the restoration of the bedrock groundwater quality to achieve applicable standards, and to prevent the contamination of other nearby residential wells.

-construction and operation at the site of a water treatment facility to manage waste waters generated by the leachate management at the disposal site, and by the groundwater extraction system.

-maintenance of all existing residential well monitoring and treatment, to prevent exposures of people using water from the residential wells to the contaminants within the bedrock groundwater contaminant plume above applicable standards;

-design and implementation of a monitoring program to evaluate groundwater elevations and groundwater quality over the duration of the remedy;

-design and implementation of a monitoring and maintenance program for the disposal site to evaluate performance of the water and leachate management system.

-continuation of institutional controls at the site.

New York State Department of Health Acceptance

The New York State Department of Health concurs with the remedy selected for this site as being protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

Date

1/03/01



Michael J. O'Toole, Jr., Director
Division of Environmental Remediation

TABLE OF CONTENTS

SECTION	PAGE
1: Summary of the Record of Decision	1
2: Site Location and Description	2
3: Site History	3
3.1 Operational/Disposal History	3
3.2 Remedial History	6
4: Current Status.	7
4.1 Summary of Remedial Investigation	9
4.1.1 Nature of Contamination	10
4.1.2 Extent of Contamination.	11
4.2 Interim Remedial Measures	12
4.3 Summary of Human Exposure Pathways	12
4.4 Summary of Environmental Exposure Pathways	13
5: Enforcement Status	13
6: Summary of the Remediation Goals	14
7: Summary of the Evaluation of Alternatives	15
7.1 Description of Remedial Alternatives	15
7.2 Evaluation of Remedial Alternatives	22
8: Summary of the Selected Remedy	33
9: Highlights of Community Participation	35
<u>Figures</u> - Site Location Map	37
- Site Map	38
<u>Tables</u> - Table 1: Nature and Extent of Contamination.	39
- Table 2: Remedial Alternative Costs.	40

<u>Appendix</u>	-	Appendix A: Responsiveness Summary	41
		Att. 1 - Additional Cost Evaluations.	42
		Att. 2 - Nassau Lake Sediment Exposures.	43
		Att. 3 - Contaminated Groundwater Zone of Influence.	44
		Att. 4 - Letter to Judge McAvoy.	45
	-	Appendix B: Administrative Record	46

RECORD OF DECISION

Dewey Loeffel Site
Operable Unit 2
Town of Nassau, Rensselaer County
Site No.4-42-006
December, 2000

SECTION 1: SUMMARY OF THE RECORD OF DECISION

The New York State Department of Environmental Conservation (NYSDEC) in consultation with the New York State Department of Health has selected this remedy to address the significant threat to human health and/or the environment created by the presence of hazardous waste associated with Operable Unit 2 of the Dewey Loeffel class 2, inactive hazardous waste disposal site. As more fully described in Sections 3 and 4 of this document, the Dewey Loeffel site was reportedly used from 1952 to 1968 by the Loeffel Waste Oil Removal and Service Company as a private scavenger service and disposal facility for waste materials and later as a waste oil transfer station. These activities have resulted in the disposal of a number of hazardous wastes, including solvents, waste oils, PCBs, scrap materials, sludges, and solids at the site, some of which were released or have migrated from the site to surrounding areas, including into the bedrock aquifer which underlies the vicinity of the site.

As more fully described in Sections 3 and 4 of this document (see pages 4 to 13), hazardous wastes were disposed at the Dewey Loeffel Site, # 442006. Hazardous wastes disposed include a wide variety of volatile organic compounds (VOCs), and polychlorinated biphenyls (PCBs), some of which has migrated from the site to the overburden and bedrock groundwater giving rise to significant threats to the public health and the environment, viz.,

- significant environmental damage associated with impacts of contaminants (PCBs & VOCs) on both the shallow overburden and bedrock aquifers beneath the site which has been used for human water consumption and is now unusable due to the presence of PCBs and VOCs above applicable standards.

In order to address the Dewey Loeffel disposal site, to eliminate or mitigate all significant threats to human health and/or the environment, the Department is proposing Alternative 9, Disposal Site Hydraulic Containment with Downgradient Groundwater Recovery and Treatment. The elements of the proposed remedy are:

-installation within the landfill of an upgraded leachate collection system, intended to eliminate the disposal site as an ongoing source of groundwater contamination by achieving hydraulic containment of the leachate and groundwater associated with the disposal site;

-installation of groundwater extraction wells between the landfill and the residential wells to the south of the site. These recovery wells are intended to accelerate the restoration of the bedrock groundwater quality to achieve applicable standards, and to prevent the contamination of other nearby residential wells.

-construction and operation at the site of a water treatment facility to manage waste waters generated by the leachate management at the disposal site, and by the groundwater extraction system.

-maintenance of all existing residential well monitoring and treatment, to prevent exposures of people using water from the residential wells to the contaminants within the bedrock groundwater contaminant plume above applicable standards;

-design and implementation of a monitoring program to evaluate groundwater elevations and groundwater quality over the duration of the remedy;

-design and implementation of a monitoring and maintenance program for the disposal site to evaluate performance of the water and leachate management system.

-continuation of institutional controls at the site.

The selected remedy, discussed in detail in Section 8 of this document, is intended to attain the remediation goals selected for this site, in Section 6 of this Record of Decision (ROD), in conformity with applicable standards, criteria, and guidance (SCGs).

SECTION 2 SITE LOCATION AND DESCRIPTION

The Loeffel Site is an inactive hazardous waste disposal site located within a 19.6 acre permanent easement obtained by the NYSDEC in southern Rensselaer County, New York (Figure 1). The Village of Nassau, New York is approximately four miles to the southwest.

The Loeffel site is located in a low area between two wooded hills with peak elevations of 876 and 778 feet above mean sea level (MSL). Topography in the area generally slopes downward from east to west. Elevations in the immediate vicinity of the Site range from approximately 610 to 660 feet above MSL.

Current surface drainage on the Loeffel Site is controlled by a series of drainage swales built into the vegetated landfill cap and side drainage around the edge of the landfill cap, which was constructed in 1984. From the disposal site, surface water flows into tributaries and streams which are part of the Nassau Lake drainage basin, a subset of the Valatie Kill drainage basin.

The majority of surface water drains from the Loeffel site to the northwest (the "Northwest Drainage System") toward Mead Road Pond (see Figure 1). Water exiting Mead Road Pond flows via a small stream, the T11A tributary, which in turn flows into the Valatie Kill. The Valatie Kill flows in a south westerly direction to Nassau Lake, approximately 2 miles downstream. Surface water flowing to the southeast (the "Southeast Drainage System") from the Loeffel Site flows to a low-lying area and to a small unnamed tributary (undesignated by New York State) and then into Valley Stream. Valley Stream flows through Smith Pond and discharges to Nassau Lake. Surface waters are described in detail in the "Loeffel Site Environs Feasibility Study Report: Surface Water, Sediment, and Biota" (BBL 1997a) and previously completed Loeffel Site environs RI documents (BBL, 1993, 1995, and 1997b). The issues related to the surface water and sediment PCB contamination will be addressed in a separate Proposed Remedial Action Plan.

Groundwater flow in the overburden soils in the vicinity of the site are generally to the west; in the bedrock, flows are both to the west and to the south. Groundwater flows to the south are influenced by the presence of a fracture zone associated with a previously unmapped fault beneath the site area.

SECTION 3 SITE HISTORY

3.1 Operational/Disposal History

The Loeffel site was reportedly used from 1952 to 1968 by the Loeffel Waste Oil Removal and Service Company as a private scavenger service and disposal facility for waste materials and later as a waste oil transfer station. The disposal and oil transfer site facilities consisted of a lower (1 acre) and upper (5 acres) lagoon in the western and central portion of the site, a 25- by 150- foot, 6 foot deep oil pit in the east central part of the site, four above-ground oil storage tanks (30,000 gallons each), and a drum disposal area located in the southern and eastern portions of the Site (O'Brien & Gere, 1981) (see Figure 2). Miscellaneous drums, construction debris, and junk automobiles were also present along the southeastern end of the site (O'Brien & Gere, 1981).

During disposal operations, hazardous waste materials were reportedly collected in 55 gallon drums and transported to the Site (USEPA, 1981). The contents of reusable drums were dumped either into the oil pit or into the upper lagoon. Unusable drums were dumped either on the perimeter of the upper lagoon or in the drum burial area. Drums were later covered with soil. The pit was used to store and separate recyclable oily wastes. The non-recyclable contents were

pumped into the lagoon or onto the ground surface (USEPA, 1981). Waste materials were reportedly also burned during facility operations.

NYSDEC has estimated that a total of 37,530 tons of waste materials were transported from General Electric (GE) manufacturing facilities to the Loeffel Waste Oil Removal and Service Company facility (NYSDEC, 1980). NYSDEC has estimated that 8,790 tons of waste materials were deposited at the site from other industrial sources, including Bendix Corporation (now a part of Allied Signal, Inc.) and Schenectady Chemicals, Inc. (now Schenectady International) (O'Brien & Gere, 1981). The waste materials disposed at the site included solvents, waste oils, PCBs, scrap materials, sludges, and solids.

In 1966, the State of New York initiated legal action against the Loeffel Waste Oil Removal and Service Company, leading to a 1968 New York State Supreme Court Order and Judgment against the company to stop discharges from the disposal facility and to perform remedial activities. In October 1970, the Loeffel Waste Oil Removal and Service Company retained an engineering firm, C.T. Male and Associates, to develop remedial measures for the Loeffel waste disposal facility (O'Brien & Gere, 1981). Remedial actions consisted of covering and grading the drum disposal area, oil pit, and lagoon with soil, and construction of a system of drainage channels around the facility to control surface water runoff entering the disposal facility area. These remedial measures were completed in 1974. Fill material was reportedly excavated from a borrow pit southwest of the disposal facility (see Figure 2). The Loeffel Waste Oil Removal and Service Company reportedly continued to use the Site from 1974 to 1980 as a transfer station for waste oils utilizing the four 30,000 gallon above-ground storage tanks. According to Mr. Dewey Loeffel, these waste oils were transported to the facility from operations owned by a number of industrial companies and other entities (BBL, 1992).

On September 23, 1980, GE entered into an agreement with the NYSDEC, known as the Seven Sites Agreement (Agreement). The Agreement required GE to perform field investigations to determine the conditions at the Loeffel Site and the nature and extent of hazardous wastes. Following these field investigations, GE submitted an engineering report, which included the data collected during the field investigations, identified alternative remedial programs, and recommended a remedial program from these alternatives. The report also included provisions for (1) maintenance and monitoring of the remediated site, (2) collection, treatment and disposal of any leachate generated at the remediated site, where appropriate, and, (3) the physical security of the remediated site (NYSDEC, 1980). Following approval of the final site remediation plan by NYSDEC, GE was required to pay NYSDEC \$2.33 million, representing its estimated share of the costs of implementing the construction elements of the remedial program and the costs of operating, maintaining, and monitoring the Site.

The engineering report prepared by O'Brien & Gere Engineers, Inc. (O'Brien & Gere) on behalf of GE recommended an in-place containment alternative consisting of a low permeability cap with vegetative cover, surface water drainage swales, and a perimeter cutoff wall constructed to

till or bedrock (O'Brien & Gere, 1981). During the design phase, it was determined that the cut-off wall should be extended to the bedrock and that a leachate collection system should be installed. The final remedial plans and specifications were submitted to NYSDEC in January 1983 for its subsequent use (O'Brien & Gere, 1983).

Approximately 500 surface drums were removed from the eastern end of the Site in preparation for the remedial program. The four 30,000 gallon above-ground storage tanks were also removed that year (CDM, 1985).

The NYSDEC approved remedy, installation of a clay cap and soil/bentonite clay slurry wall, was constructed from September 1983 to November 1984. In October 1985, a final site inspection was conducted. Since the final inspection, operation, maintenance, and monitoring activities have been performed periodically by NYSDEC.

In 1989, the State of New York brought suit against GE in the U.S. District Court for the Northern District of New York seeking to hold GE liable for cleanup costs and natural resource damages relating to impacts of hazardous waste present outside of the disposal site after cap completion to the environs of the Loeffel site. Subsequently, an RI Work Plan, a Sampling and Analysis Plan, and a Health and Safety Plan were developed on GE's behalf by BBL and submitted for NYSDEC review (BBL, 1992). These documents were approved by NYSDEC in July 1992. On September 23, 1992, GE and the State of New York entered into a Judicial Stipulation, under which GE agreed to conduct an RI in accordance with the approved work plan. GE also agreed to conduct an FS to assess potential remedial alternatives.

In April 1994, an interim hydrogeologic investigation report was submitted describing initial RI hydrogeologic studies completed between fall 1993 through spring 1994 (GeoTrans, 1996b).

Phase II hydrogeologic studies included: reviewing and verifying the well construction of 34 residential wells; conducting geophysical surveys south of the site to characterize bedrock structure; gathering additional groundwater data through installation, packer testing, and sampling of new monitoring wells; evaluating landfill hydraulic parameters and leachate collection system hydraulics; and obtaining data to evaluate natural attenuation and degradation of contaminants in groundwater. Phase II hydrogeologic field activities were completed February 1997 (HSI Geotrans, 1997).

Residential well monitoring in the vicinity of the Loeffel site has been performed by the New York State Department of Health (NYSDOH) periodically since November 1979. During the early phases of this monitoring program, only those wells immediately to the northwest of the site were sampled. In the early 1980s, wells to the south and farther from the site were also sampled. Currently, 22 residential wells are sampled on an annual basis and as of October 1997, eight of those wells will also be sampled on a semi-annual basis. BBL Environmental Services,

Inc. (BBLES), on behalf of GE, assumed responsibility for residential well sampling from NYSDOH on an interim basis in November 1997.

In 1993, BBLES was retained by GE to design install, maintain, and monitor residential well treatment systems on an interim basis for two residential properties south of the disposal site along Central Nassau Road where water quality standards have been exceeded.

3.2 Remedial History

1974 - Remedial actions consisting of covering and grading the drum disposal area, oil pit and lagoon and construction of a system of drainage ditches were completed.

1982 - CECOS International, Inc. removed approximately 500 surface drums from the eastern portion of the site. The four 30,000 gallon above-ground tanks were also removed.

1984 - Construction of the containment system at the site is completed. The containment system consists of a slurry wall, a clay cap, and a leachate collection system.

The slurry wall is a trench, excavated from land surface down into unweathered bedrock, which was backfilled with a mixture of the excavated soil and bentonite clay. The slurry wall has a hydraulic conductivity which is significantly lower than the surrounding soils, which impedes groundwater flow into and out of the disposal site.

The clay cap was constructed over the entire disposal site, and ranges from 4.5 to 6 feet in thickness. The cap is designed to impede the recharge of rainfall and snowmelt into the disposal site.

The leachate collection system consists of a series of drainage pipes which were installed in the western third of the disposal site before the site was graded and capped. The pipes drain to a collection tank. Periodically, leachate is removed from the tank by a state contractor for appropriate off-site disposal.

Other areas of this site currently being studied (by GE with State oversight) are the Loeffel Environs, the subject of the 1992 Judicial Stipulation. The Environs consist of various drainage ways: (1) low lying areas west of the site; (2) Mead Road Pond and spoil banks; (3) Tributary T-11A; (4) Valatie Kill; and (5) Nassau Lake. The principal contaminant for this part of the site is PCBs.

SECTION 4 CURRENT STATUS

In response to a determination that the disposal of hazardous waste at the site presents a significant threat to human health and the environment, GE has completed a Remedial Investigation and Feasibility Study (RI/FS). This latest RI/FS is a continuing investigation of the containment cell and groundwater, and supplements the RI/FS done in 1982-83. The need for a groundwater investigation arose from a 1992 finding that private wells were contaminated with site related chemicals.

A separate RI/FS program is ongoing for surface water drainage from the site to Nassau Lake, some four miles away. This aspect of the remedial program for this site will be addressed in a separate proposed remedial action plan.

The Commissioner may find that hazardous waste disposed at the site constitutes a significant threat to the environment if, after reviewing the available evidence and considering the factors the Commissioner deems relevant set forth in 6 NYCRR 375-1.4(b), the Commissioner determines that the hazardous waste disposed at the site or coming from the site results in, or is reasonably foreseeable to result in, any of the following:

(a) a determination by NYSDOH or by the Agency for Toxic Substances and Disease Registry, where the site is near private residences, recreational facilities, public buildings or property, school facilities, places of work or worship, or other areas where individuals or water supplies may be present, that the presence of hazardous waste on a site poses a significantly increased risk to the public health.

(b) significant environmental damage (6 NYCRR 375-1.4[a][2]).

In making a finding as to whether a significant threat to the environment exists, among others, the Commissioner may take into account any or all of the following matters, as may be appropriate under the circumstances of the particular situation:

- the duration, areal extent, or magnitude of severity of the environmental damage that may result from a release of hazardous waste (6 NYCRR 375-1.4[b][1]);
- type, mobility, toxicity, quantity, bioaccumulation, and persistence of hazardous waste present at the site (6 NYCRR 375-1.4[b][2]);
- manner of disposal of the hazardous waste (6 NYCRR 375-1.4[b][3]);
- nature of soils and bedrock at and near the site (6 NYCRR 375-1.4[b][4]);
- groundwater hydrology at and near the site (6 NYCRR 375-1.4[b][5]);

- location, nature, and size of surface waters at and near the site (6 NYCRR 375-1.4[b][6]);
- levels of contaminants in groundwater, surface water, air, and soils at and near the site and areas known to be directly affected or contaminated by waste from the site, including, but not limited to, contravention of: ambient surface water standards set forth in Part 701 or 702 of this Title; ambient groundwater standards set forth in Part 703 of this Title; drinking water standards set forth in Subpart 5-1 and Part 170 of Title 10 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR 375-1.4[b][7]);
- proximity of the site to private residences, recreational facilities, public buildings or property, school facilities, places of work or worship, and other areas where individuals may be present (6 NYCRR 375-1.4[b][8]);
- the extent to which hazardous waste and/or hazardous waste constituents have migrated or are reasonably anticipated to migrate from the site (6 NYCRR 375-1.4[b][9]);
- the proximity of the site to areas of critical environmental concern (as, wetlands or aquifers) (6 NYCRR 375-1.4[b][10]);
- the potential for wildlife or aquatic life exposure that could cause an increase in morbidity or mortality of same (6 NYCRR 375-1.4[b][11]);
- the integrity of the mechanism, if any, that may be containing the hazardous waste to assess the probability of a release of the hazardous waste into the environment (6 NYCRR 375-1.4[b][12]); and
- the climatic and weather conditions at and in the vicinity of the site (6 NYCRR 375-1.4[b][13]).

(For a more detailed discussion respecting NYSDEC's "significant threat" determinations and the rationale for NYSDEC's use of the above, and other, factors, in its decisionmaking, see the Draft Regulatory Impact Statement for 6 NYCRR Part 375, dated April 1991, at pages 19 to 25; and the Hearing Report, Responsiveness Summary, and Revision to the Draft Regulatory Impact Statement for 6 NYCRR Part 375, dated March 1992, at pages II-7 to II-19.)

The bases for the determination that the site poses a significant threat to human health and the environment are founded on the following:

The hazardous wastes present contribute to or result in:

- contravention of ground water standards for PCBs and VOCs (for concentrations of contaminants in groundwater at the site, see Table 1 below; for Water Quality Standards, see 6 NYCRR Parts 701 and 702, attached)
- contraventions of drinking water standards for PCBs and VOCs (for concentrations of contaminants in groundwater at the site, see Table 1 below; for drinking water standards, see 10 NYCRR Subpart 5-1 and Part 170, attached)

The determination of significant threat associated with Operable Unit 2 of the Dewey Loeffel site is therefore based primarily on the significant environmental damage associated with impacts of contaminants (PCBs and VOCs) on both the shallow and deep bedrock aquifers beneath the site, which were usable for human water consumption in the past and are now unusable due to the presence of the PCBs and VOCs above applicable standards.

4.1 Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The results of the remedial investigations for the Dewey Loeffel site are described below.

The RI to address the disposal site and the associated groundwater contamination was conducted in two phases. The first phase was conducted between July 1995 and March 1996 and the second phase (which was done to fill in data gaps identified in the first phase) between April 1996 and January 1997. Reports have been prepared describing the field activities and findings of the RI in detail.

The RI included the following activities:

- Conducted a geophysical survey (Ground Penetrating Radar) to identify the exact location of portions of the previously installed 1984 slurry wall.
- Drilled soil borings to better interpret the soil stratigraphy at the site.
- Installed monitoring wells for collection of soil and groundwater samples, both on and offsite.
- Sampled and analyzed soil and groundwater, both on and off site.
- Evaluated deep bedrock groundwater conditions.
- Investigated for the presence of DNAPL at this site.
- Investigated the slurry wall for leakage.
- Prepared and submitted reports.

To determine which media (soil, groundwater, etc.) contain contamination at levels of concern, the RI analytical data were compared to environmental Standards, Criteria, and Guidance

(SCGs). Groundwater and drinking water SCGs identified for the Dewey Loeffel containment cell site were based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part V of New York State Sanitary Code. NYSDEC soil cleanup guidelines for the protection of groundwater (TAGM 4046), and background conditions were used as SCGs for soil.

Based on the results of the remedial investigation in relation to the SCGs and potential public health and environmental exposure routes, additional remediation work is required to supplement the previous remedial actions taken at the site. More complete information can be found in the Remedial Investigation (RI) reports for the site, which can be found at the document repositories..

For results of chemical analyses of soil and water, see Table 1 (attached). Soil chemical concentrations are reported in milligrams per kilogram (mg/kg, equivalent to parts per million, ppm). Concentrations in water are reported in parts per billion (ppb). For comparison purposes, SCGs are given for each medium as appropriate.

4.1.1 Nature of Contamination

Dewey Loeffel Disposal Area

The Dewey Loeffel site is contaminated with several types of chemical compounds, including PCBs, and volatile organic compounds (VOCs), which are typically industrial solvents and lubricants used during various manufacturing processes. Semi-volatile organic compounds and heavy metals were also found at the disposal site.

As described in the RI Report, numerous soil and groundwater samples were collected at the site to characterize the nature and extent of contamination. VOCs and PCBs were selected as indicator parameters for the latest set of investigations; VOCs due to their mobility, and PCBs due to the potential concern for subsurface transport of PCBs away from the site, impacting the already contaminated surface water systems leading away from the site.

Soil samples collected from borings in the vicinity of the disposal site contained VOCs and PCBs. Some of the samples were collected from borings drilled at the site, and others as far to the southeast as Central Nassau Road.

Groundwater samples were collected from on-site and off-site monitoring wells. Groundwater samples from the overburden aquifer were found to contain VOCs and PCBs. The bedrock groundwater in the vicinity of the site, and to the south, had numerous contraventions of groundwater standards. The bedrock groundwater contaminant plume south of the site is primarily associated with a previously unmapped geologic fault in the bedrock, which extends from north of the site, beneath the site, and south beyond Central Nassau Road. The bedrock in

the immediate vicinity of the fault has a higher degree of fracturing, which allows for a greater hydraulic conductivity along the fault axis. However, near the disposal site, bedrock groundwater contamination has been identified beyond the immediate vicinity of the fault.

The migration of contaminants from the disposal site has apparently continued, even after construction of the cap, slurry wall, and leachate collection system. The water levels in the bedrock to the east of the site are higher than the water levels within the landfill, so groundwater can enter the eastern portion of the site from the underlying bedrock. In the central portion of the site, water levels in the bedrock are lower than within the disposal site, and water bearing contaminants can migrate out of the disposal site into the underlying bedrock.

The off-site VOC plume has been traced (through the installation of monitoring wells, use of geophysics, and analysis of groundwater samples) to extend south of the disposal site to the vicinity of Central Nassau Road, a distance of approximately one-half mile. In the vicinity of Central Nassau Road, two properties were identified which had domestic wells impacted by contaminants from the site. (See Attachment 3, page 44)

4.1.2 Extent of Contamination

Table 1, page 39, summarizes the extent of contamination for the contaminants of concern in the soil and groundwater and compares the data with the applicable Standards, Criteria, and Guidelines (SCGs). The following are the media which were investigated and a summary of the findings of the investigation.

Soil

Soil samples were collected from borings drilled through the containment cell, adjacent to the slurry wall, in various locations and down gradient from the site. Virtually all of the samples were analyzed for VOCs and PCBs. See Table 1 for data summary.

Overburden Groundwater

In the vicinity of the containment cell, shallow groundwater is contaminated above Class GA groundwater standards for numerous chemicals, including benzene, toluene, xylene, trichloroethene, and PCB (Aroclor-1260). Generally, the groundwater standards for each of these chemicals is 5 ppb; PCBs have a standard of 0.09 ppb. See Attachment 3, page 44, for a map showing the extent of contamination in the overburden and bedrock groundwater under and adjacent to the site and in the plume emanating from the site toward Central Nassau Road. See Table 1 for a data summary.

Bedrock Groundwater

Shallow (generally 45 to 75 feet below grade) bedrock groundwater is significantly contaminated. The highest detection of total volatile organic compounds (TVOCs) was 147,900 ppb at MW 201.

Off-site, to the south, well OMW-201 exhibited TVOCs at 77,350 ppb, while north of the site a value of 34 ppb was found in residential well 191-05-15. Monitoring wells OMW-221, 222, and 223, located south of the site along Central Nassau Road did not show any concentrations of VOCs. However, three residential wells on two properties north of Central Nassau Road have been impacted by VOCs since 1992. Water from these wells is treated by carbon absorption and routinely monitored. (See Attachment 3, page 44)

4.2 Interim Remedial Measures

Interim Remedial Measures (IRMs) are discrete sets of activities to address both emergency and non-emergency site conditions, which can be undertaken without extensive investigation or evaluation, to prevent, mitigate, or remedy environmental damage attributable to a site. One IRM has been completed at the site, which was the installation of the filters on the domestic water supplies at the two properties on Central Nassau Road in 1993, and their subsequent operation and maintenance.

4.3 Summary of Human Exposure Pathways

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the health risks related to the disposal site and associated groundwater contamination can be found in Section 7 of the RI Report.

An exposure pathway is how an individual may come into contact with a contaminant. The five elements of an exposure pathway are 1) the source of contamination; 2) the environmental media and transport mechanisms; 3) the point of exposure; 4) the route of exposure; and 5) the receptor population. These elements of an exposure pathway may be based on past, present, or future events.

Completed pathways which exist at the site include:

- Incidental Ingestion, Inhalation, and Dermal Contact: On-site workers could be exposed to contaminants in the soil and shallow groundwater while conducting intrusive operation and maintenance activities within the disposal site (i.e. under the cap)
- Direct Ingestion, Inhalation and Dermal Contact. Off-site groundwater is being used by downgradient homeowners (with treatment), for drinking, cooking, and bathing. Other common uses, as car washing and gardening, provide contact with the groundwater. Additional exposure occurs as on and off-site wells are sampled for data collection and assessment. Currently, exposures are managed by the operation and maintenance of the filters on the private wells.

4.4 Summary of Environmental Exposure Pathways

This section summarizes the types of environmental exposures presented by the site. There are no known pathways which result in exposure to environmental receptors associated with the groundwater contaminant plume. Environmental exposures related to past releases from the disposal site (related to the PCB contamination in the site drainage ways and the Nassau Lake/Valatie Kill surface water system) will be addressed in a separate proposed remedial action plan.

SECTION 5 ENFORCEMENT STATUS

The following is a chronology of the enforcement actions related to the Loeffel site.

In an agreement between GE and NYSDEC signed on September 24, 1980, and covering seven inactive hazardous waste disposal sites in northeastern New York State ("Seven Site Agreement"), among other things, GE committed to: (1) perform a field investigation at and around the Loeffel Site to determine the areal and vertical extent of contamination; (2) prepare an engineering report summarizing all data developed in the course of the field investigation and then recommending a remedial program; and (3) present a preliminary plan and schedule for implementation of the remedial program, and provide an estimate of the cost of such implementation.

GE subsequently hired a consulting engineering firm to conduct an investigation and prepare the various reports required by the Seven Site Agreement. After NYSDEC approved GE's final plan for implementation of a remedial program, GE paid NYSDEC \$2.33 million towards remedial construction, monitoring and maintenance of the site, and obtained a qualified release from further legal liability. The State collected approximately \$550,000 from two other entities whose wastes were disposed of at the site: Bendix Corporation, and Schenectady Chemicals, Inc.

In exchange for preparing the required reports and paying NYSDEC, GE was provided a release from any "claim, demand, remedy, or action whatsoever" against GE which NYSDEC may have "relating to or arising from GE's disposal of waste at the Loeffel site". However, the consent order included a "reservation of rights" clause which preserved NYSDEC's rights to sue GE with regard off-site impacts, as follows:

Nothing herein shall be construed as barring, diminishing, adjudicating, and in any way affecting... [NYSDEC's] right to bring any action of any kind with respect to areas or resources that may have been affected as a result of the release or migration of hazardous waste from such sites.

In 1989, relying on the above-referenced reservation of rights, the State filed suit against GE under the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S. C. 9601 *et seq.*, as amended (the federal Superfund law), and State common law, based on the State's determination that PCBs and other wastes had migrated from the Loeffel Site prior to its encapsulation. In 1992, the parties entered into a stipulation approved in Federal Court obligating GE to: (1) conduct an expansive investigation of the extent of contamination in the drainage ways leading away from the Loeffel Landfill; and then (2) recommend a remedial program.

SECTION 6 SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR 375-1.10. The overall remedial goal is to restore the site to pre-disposal conditions, to the extent feasible and authorized by law. At a minimum, the selected remedy must eliminate, or mitigate to the extent practicable through the proper application of scientific and engineering principles, all significant threats to the public health and to the environment presented by the hazardous waste disposed at the site. The goals selected for this site, in conformity with applicable Standards, Criteria, and Guidance (SCGs), are:

- Eliminate, to the extent practicable, ingestion of groundwater affected by the site that does not attain NYSDEC Class GA Ambient Water Quality Criteria.
- Eliminate, to the extent practicable, off-site migration of groundwater that does not attain NYSDEC Class GA Ambient Water Quality Criteria.
- Eliminate, to the extent practicable, exceedances of applicable environmental quality standards related to releases of contaminants to the waters of the state.
- Eliminate, to the extent practicable, human exposures to groundwater containing contaminants in excess of applicable drinking water standards

SECTION 7 SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy must be protective of human health and the environment, be cost effective, comply with other statutory laws and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for the Loeffel Containment cell were identified, screened, and evaluated in a Feasibility Study and addendum. These evaluations are presented in the report entitled "Loeffel Site Environs Groundwater Feasibility Study" (6/3/98), and "Loeffel Site Environs Groundwater Feasibility Study" (11/24/98).

7.1 Description of Alternatives

Alternative 1

No Further Action

This alternative recognizes remediation of the site conducted under previously completed remedial actions. Only continued monitoring is necessary to evaluate the effectiveness of the existing remedial program.

This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

Present Worth:	\$1,096,000
Capital Cost:	\$0
Annual O&M:	\$71,300
Time to Implement	Complete

Alternative 2

Hydraulic Control

The existing leachate collection system would be used to manage migration of contaminated groundwater in the aquifer. Groundwater collected would continue to be treated offsite.

A site wide long-term groundwater monitoring system will be designed and implemented. All other aspects of alternative 1 will be retained.

The only benefit of this alternative over Alternative 1 is an expanded monitoring program. As such it does not address human health and environmental exposures nor provide for any hazardous waste cleanup.

Present Worth:	\$2,931,000
----------------	-------------

Capital Cost	\$0
Annual O&M:	\$182,700
Time to Implement	1 year

Alternative 3A:

Enhanced Hydraulic Control with Off-site Leachate Disposal

Alternative 3A is comprised of components described in Alternative 2 combined with use of the existing leachate collection system at its maximum yield of approximately 800,000 gallons per year. This alternative involves the continued transportation of the extracted leachate to an off-site treatment and disposal facility.

The existing leachate collection system within the landfill would be pumped to maximum yield. Based on testing conducted during the RI, this rate is estimated to be about 800,000 gallons per year. For Alternative 3A, the collected leachate would be transported off-site for proper treatment and disposal. The existing leachate collection system is not deep or extensive enough to provide hydraulic containment over the area of the landfill, even with leachate collection at the maximum yield. Increasing the leachate collection rate would, however, decrease the flux of contaminants from the disposal site.

Present Worth:	\$4,551,800
Capital Cost:	-0-
Annual O&M:	\$296,100
Time to Implement	1 year

Alternative 3B:

Enhanced Hydraulic Control with Onsite Treatment

Similar to Alternative 3A, Alternative 3B would achieve enhanced hydraulic control by the same extraction method. However, in this case, groundwater would be treated onsite to achieve discharge standards.

The leachate treatment system in Alternative 3B would address the contaminants of concern in the Loeffel Site leachate. Figure 4 is a process flow diagram depicting the anticipated treatment methods. The treatment process includes oil/water separation, with treatment of the aqueous fraction via coagulation/flocculation; chemical precipitation, filtration, dewatering of sludges produced by the treatment, and air stripping of the remaining aqueous fraction followed by carbon adsorption and discharge. The leachate treatment system would be sized to treat 10

gallons per minute (gpm) which is the minimum size at which most treatment components are available.

Present Worth:	\$3,933,000
Capital Cost:	\$1,009,493
Annual O&M:	\$190,182
Time to Implement	1 year

Alternative 4:

Enhanced Hydraulic Control with Expanded Collection and On-Site Treatment and Disposal

The existing leachate collection system within the landfill would be expanded and an on-site leachate treatment system would be constructed and operated with discharge of the treated leachate to surface water. The existing leachate collection system is not deep or extensive enough to provide hydraulic containment over the area of the landfill regardless of the pumping rate. The expanded system would create a laterally inward gradient in those areas of the landfill where outward gradients currently exist, and would control some migration of leachate from the containment system. The expanded leachate collection system may not, however, be able to create upward gradients over the entire landfill area, and some leachate migration away from the disposal site would likely continue to occur.

A conceptual plan of the expanded leachate collection system would involve the installation of two or three drains positioned inside the cut-off wall extending an average of 25 feet below ground surface (BGS) to a level which will create an inward and, in the areas in the immediate vicinity of the drains, upward gradient when the drains are continuously evacuated. Preliminary calculations suggest a combined pumping rate of approximately 5 gpm would be needed.

The leachate treatment system would address the contaminants of concern in the Loeffel site leachate (e.g., in PCBs, VOCs, metals). The treatment process includes oil/water separation, with treatment of the aqueous fraction via coagulation/flocculation, chemical precipitation, filtration, dewatering of sludges produced by the treatment, and air stripping of the remaining aqueous fraction followed by carbon adsorption and discharge to surface water. The leachate treatment system would be sized to treat 10 gpm in order to handle peak flows.

All wells in the Loeffel Site environs and the leachate collection tanks at the Site would be enclosed and locked to prevent unauthorized access. The leachate treatment building would be locked and secured and, depending on location, may also be fenced. A Health and Safety Plan would be prepared for the remedial activities. In conformance with OSHA regulations, site workers would be trained, required to wear appropriate protective equipment, and, as applicable, would be enrolled in a medical monitoring program. Groundwater monitoring wells would be

sampled to determine changes in the VOC plume. Residential wells would also be monitored, with contingencies for implementing point-of-use treatment systems for wells demonstrated to be impacted by VOCs from the Site.

Present Worth:	\$6,558,905
Capital Cost:	\$1,725,622
Annual O&M:	\$314,411
Time to Implement	1 year

Alternative 5:

Near Site Pump and Treat System

The components of Alternative 5 include all components of Alternative 2. These include: (1) long-term groundwater monitoring in the Loeffel Site environs; (2) long-term residential well monitoring; (3) well head treatment for those residential wells impacted by VOCs from the Loeffel Site; and (4) five-year reviews to ensure continued protectiveness.

Additionally, a groundwater pump-and-treat system would be installed and operated immediately adjacent to the site to intercept contaminated groundwater and prevent further off-site migration of contaminants away from the immediate vicinity of the disposal site. Twenty bedrock recovery wells would be installed into bedrock hydraulically downgradient of the landfill to the south and west. Extracted groundwater would be treated onsite to meet the discharge standards.

Groundwater recovery wells would use submersible or pneumatic pumps to create hydraulic capture south and west of the landfill. Recovered water would be sent to a treatment system located on or near the Loeffel site through below-grade piping.

Groundwater treatment would address the contaminants of concern in the bedrock groundwater. The primary treatment operation will be air stripping for the removal by carbon adsorption and filtration. Air stripping with GAC polishing was deemed the most cost-effective, proven treatment train for this alternative.

Present Worth:	\$4,403,200
Capital Cost:	\$976,100
Annual O&M:	\$223,000
Time to Implement	1 year

Alternative 6:

Increased Leachate Collection with Near Site Groundwater Recovery and Treatment

Alternative 6 is comprised of all the components of Alternative 2 combined with the pump and treat of Alternative 5, and the increased leachate collection as identified in Alternative 3B.

Alternative six would include 1) long-term groundwater monitoring; 2) long term residential monitoring; 3) wellhead treatment for residential wells impacted by VOCs from the Loeffel site, and five year reviews to ensure continual protectiveness. In addition, as in Alternative 5, groundwater recovery wells would be installed into the bedrock south and west of, and immediately adjacent to, the disposal site. All extracted leachate and groundwater would be treated as identified in Alternative 3B.

Present Worth:	\$5,690,300
Capitol Costs:	\$1,695,700
Annual O & M:	\$260,000
Time to Implement:	One Year

Alternative 7:

Disposal Site Hydraulic Containment

Alternative 7 is comprised of components detailed in Alternative 2 as described earlier in this document combined with an expanded and deepened leachate collection system. This approach would maintain an inward and upward flow of groundwater from the overburden and bedrock adjacent to and underneath the landfill site. Collected leachate is treated on site with subsequent surface water discharge as identified in Alternative 3B.

The existing leachate collection system within the landfill would be expanded and deepened (to a greater extent than Alternative 4) and an on-site leachate and groundwater treatment system would be constructed and operated as in Alternative 3B). Neither the existing leachate collection system nor the system envisioned under Alternative 4 is not deep or extensive enough to provide hydraulic containment over the area of the landfill no matter how much pumping is done. A more laterally extensive and deeper leachate collection system would be necessary to establish an inward and upward gradient within the landfill boundaries. The expanded system would create an inward and upward gradient in those areas of the landfill where outward and downward gradients currently exist, and would control the migration of contaminants from the containment system.

Based on numerical simulations of groundwater flow in the vicinity of the Loeffel Site, this alternative involves the installation of four drains positioned inside the cutoff wall extending an average of 30 feet BGS to a level that will create an inward and upward gradient when the drains are continuously evacuated. Groundwater modeling results suggest a leachate extraction rate of approximately 10 gpm would result (Appendix A). This would draw down the water level to an elevation below the existing collection system.

Each drain would be comprised of slotted high density polyethylene (HDPE) pipe embedded in gravel and connected to a leachate collection sump equipped with a pump and associated controls. The drains could be installed by conventional or one-pass trenching technology. Deeper portions of the drains would be required to be excavated with a clam shell excavator. Leachate would be extracted from the sumps and transferred via subsurface piping to a building for subsequent treatment.

The leachate treatment system would address the contaminants of concern in the Loeffel Site leachate (e.g., in PCBs, VOCs, metals). Figure 3.2 is a process flow diagram displaying the anticipated treatment methods. The treatment process includes oil/water separation, with treatment of aqueous fraction via coagulation/flocculation, chemical precipitation, filtration, dewatering of sludges produced by the treatment, and air stripping of the remaining aqueous fraction followed by carbon adsorption and discharge surface water. To provide a factor of safety, the leachate treatment system would be sized to treat a flow rate of 20 gpm.

Present Worth:	\$8,092,000
Capitol Costs:	\$3,002,000
Annual O&M:	\$331,000
Time to Implement:	1 year

Alternative 8

Leachate Extraction and Downgradient Groundwater Recovery and Treatment

Alternative 8 is comprised of all components described in the FS for Alternative 5 combined with a groundwater pump-and-treat system in the downgradient portion of the bedrock contaminant plume. Extraction wells south and west of, and immediately adjacent to, the disposal site will intercept the contaminants in the bedrock groundwater as they leave the disposal site. Groundwater recovery wells in the bedrock to the south of the site would address VOC contamination in bedrock groundwater downgradient of the site. These wells would not capture all VOC contaminants but will intercept significant volumes of contaminants previously moving with the plume. This will eventually allow for a reduction in contaminant concentration of the forward edge of the plume.

The components of Alternative 8 include all components of Alternative 5 described previously. These include: (1) routine operation, maintenance, and monitoring activities conducted by NYSDEC at the Loeffel Site; (2) long-term groundwater monitoring in the Loeffel Site environs; (3) long-term residential well monitoring; (4) wellhead treatment for those residential wells impacted by VOCs from the Loeffel site; and (5) five-year reviews to ensure continual protectiveness and (6) installation and operation of groundwater pump-and-treat system immediately adjacent to the disposal site to intercept contaminated bedrock groundwater and prevent further off-site migration of contaminants away from the immediate vicinity of the disposal site. Pumping wells would be installed into bedrock hydraulically downgradient of the

landfill to the south and west within 200 feet of the landfill. Extraction may be optimized via use of blasted bedrock trenches. Extracted groundwater would be treated on site.

Well locations and yields were based on RI information and experience with installation of similar systems. A network of 20 wells pumping at a total yield of 22.5 gpm was estimated on the basis of current information. However, pump tests and other pre-design investigation activities should be performed prior to system design. Pumping from artificially-created fracture zones might also be considered during design and may be more cost effective. Vacuum-enhanced pumping might also be considered. Both would reduce the number of wells needed to effect containment.

Groundwater recovery wells would use submersible or pneumatic pumps to create hydraulic capture south and west of the landfill. Recovered water would be sent to a treatment system located on or near the disposal site through below-grade piping.

To address VOC contamination in groundwater downgradient of the proposed near site pump-and-treat system, downgradient extraction wells will be installed along the plume axis south of the disposal site.

Residential wells impacted by VOCs from the Loeffel Site would still require wellhead treatment.

Four recovery wells would be installed along the plume axis. Groundwater recovery wells would use submersible or pneumatic pumps to create hydraulic capture. Recovered water would be sent to a treatment system located on or near the Loeffel Site through below-grade piping.

Present Worth:	\$4,891,175
Capital Cost:	\$1,305,539
Annual O&M:	\$253,250
Time to Implement:	1 year

Alternative 9:

Disposal Site Hydraulic Containment with Downgradient Groundwater Recovery and Treatment

Alternative 9 would consist of the disposal site hydraulic containment component of Alternative 7, along with the downgradient groundwater recovery and treatment component of Alternative 8 and the monitoring and maintenance (including the residential monitoring and maintenance) components of Alternative 2.

A monitoring program would be developed and implemented to monitor groundwater elevations and groundwater quality in the vicinity of the disposal site, and in the area of the bedrock contaminant plume. The monitoring and maintenance of the residential treatment units would continue until the groundwater quality improves to allow for unrestricted use of groundwater from the residential wells.

The existing leachate collection system within the landfill would be expanded and deepened (to a greater extent than Alternative 4) and an on-site leachate treatment system would be constructed and operated with discharge of the treated leachate to surface water, (as in Alternative 3B). The existing leachate collection system is not deep or extensive enough to provide hydraulic containment over the area of the landfill no matter how much pumping is done. A more laterally extensive and deeper leachate collection system would be necessary to establish an inward and upward gradient within the landfill boundaries. The expanded system would create an inward and upward gradient in those areas of the landfill where outward and downward gradients currently exist, and would control the migration of leachate from the containment system.

To address VOC contamination in groundwater downgradient of the disposal site, downgradient extraction wells will be installed along the plume axis south of the disposal site.

Residential wells impacted by VOCs from the Loeffel Site would still require wellhead treatment.

Four recovery wells would be installed along the plume axis. Groundwater recovery wells would use submersible or pneumatic pumps to create hydraulic capture. Recovered water would be sent to a treatment system located on or near the Loeffel Site through below-grade piping.

Present Worth:	\$8,609,583
Capital Cost:	\$3,331,049
Annual O&M:	\$343,431
Time to Implement:	1 year

7.2 Evaluation of Remedial Alternatives

The criteria used to compare the potential remedial alternatives are defined in the regulation that directs the remediation of inactive hazardous waste sites in New York State (6 NYCRR Part 375). For each of the criteria, a brief description is provided followed by an evaluation of the alternatives against that criterion. A detailed discussion of the evaluation criteria and comparative analysis is presented below.

7.2.1. Compliance with New York State Standards, Criteria, and Guidance (SCGs).

Compliance with SCGs addresses whether or not a remedy will meet applicable environmental laws, regulations, standards, and guidance.

Alternative 1

This alternative would not comply with SCGs, as the area currently not in compliance with groundwater standards would not be remediated.

Alternative 2

This alternative would not provide any measure of benefit over Alternative 1 (No Further Action), and would not comply with SCGs

Alternative 3A

This alternative would not comply with SCGs, as the disposal site would continue to act as a source of contamination to the groundwater, which would not be addressed and continue to violate applicable standards. All SCGs related to operation and discharge from the water treatment units at the site would be met.

Alternative 3B

This alternative would not comply with SCGs, as the disposal site would continue to act as a source of contamination to the groundwater, which would not be addressed and continue to violate applicable standards.

Alternative 4

This alternative would not comply with SCGs, as the disposal site would continue to act as a source of contamination to the groundwater, which would not be addressed and continue to violate applicable standards. All SCGs related to operation and discharge from the water treatment units at the site would be met.

Alternative 5

This alternative would comply with SCGs after a long period of time. The disposal site would continue to act as a source of contaminants to the groundwater, which would only be addressed in the immediate vicinity of the disposal site. The portion of the bedrock groundwater contaminant plume to the south of the disposal site would be expected to achieve groundwater standards over a long period of time after implementation of this alternative, as the near site recovery system would not allow contaminants to migrate south within the bedrock. All SCGs related to operation and discharge from the water treatment units at the site would be met.

Alternative 6

This alternative would comply with SCGs after a long period of time. The disposal site would continue to act as a source of contaminants to the groundwater, which would only be addressed in the immediate vicinity of the disposal site. The portion of the bedrock groundwater contaminant plume to the south of the disposal site would be expected to achieve groundwater standards over a long period of time after implementation of this alternative, as the near site bedrock groundwater recovery system would not allow contaminants to migrate south within the bedrock. All SCGs related to operation and discharge from the water treatment units at the site would be met.

Alternative 7

This alternative would comply with SCGs after a long period of time. The disposal site would no longer act as a source of contaminants to the groundwater. The portion of the bedrock groundwater contaminant plume to the south of the disposal site would be expected to achieve groundwater standards over a long period of time after implementation of this alternative, as the disposal site hydraulic containment system would not allow contaminants to migrate out of the disposal site. All SCGs related to operation and discharge from the water treatment units at the site would be met.

Alternative 8

This alternative would comply with SCGs after a long period of time. The portion of the bedrock groundwater contaminant plume to the south of the disposal site would be expected to achieve groundwater standards over a long period of time after implementation of this alternative, as the near site bedrock recovery wells would likely not allow contaminants to migrate away from the disposal site. The disposal site would continue to act as a source of contaminants to the groundwater, which would be addressed in the immediate vicinity of the disposal site, and by bedrock groundwater recovery and treatment south of the disposal site. All SCGs related to operation and discharge from the water treatment units at the site would be met.

Alternative 9

This alternative would comply with SCGs after a long period of time. It is anticipated that this alternative, which combines source control with active remediation of the bedrock groundwater contaminant plume, would take the shortest time to meet SCGs of the alternatives evaluated. The disposal site would no longer act as a source of contaminants to the groundwater. The portion of the bedrock groundwater contaminant plume to the south of the disposal site would be addressed by the downgradient bedrock groundwater recovery and treatment system. All SCGs related to operation and discharge from the water treatment units at the site would be met.

7.2.2. Protection of Human Health and the Environment.

This criterion is an overall evaluation of the health and environmental impacts to assess whether each alternative is protective.

Alternative 1

This alternative would not be protective of human health and the environment, as releases from the disposal site would continue, the bedrock groundwater contaminant plume would persist, and the potential for unacceptable human health exposures associated with the bedrock groundwater contaminant plume would continue.

Alternative 2

This alternative would not be protective of the environment, as releases from the disposal site would continue, and the bedrock groundwater contaminant plume would not be abated. The potential for unacceptable human health exposures associated with the bedrock groundwater contaminant plume would be addressed by monitoring and treatment as needed.

Alternative 3A

This alternative would not be protective of the environment, as releases from the disposal site would continue, and the bedrock groundwater contaminant plume would not be abated. The potential for unacceptable human health exposures associated with the bedrock groundwater contaminant plume would be addressed by monitoring and treatment as needed.

Alternative 3B

This alternative would not be protective of the environment, as releases from the disposal site would continue, and the bedrock groundwater contaminant plume would not be abated. The potential for unacceptable human health exposures associated with the bedrock groundwater contaminant plume would be addressed by monitoring and treatment as needed.

Alternative 4

This alternative would not be protective of the environment, as releases from the disposal site would continue, and the bedrock groundwater contaminant plume would not be abated. The potential for unacceptable human health exposures associated with the bedrock groundwater contaminant plume would be addressed by monitoring and treatment as needed.

Alternative 5

This alternative would be protective of human health and the environment. The bedrock groundwater contaminant plume south of the site would persist over a long period of time, and the potential for unacceptable human health exposures associated with the bedrock groundwater contaminant plume would continue over a long period of time, but would eventually abate. Potential human health exposures to the contaminated groundwater in the interim would be avoided by water treatment and monitoring.

Alternative 6

This alternative would be protective of human health and the environment over the long term. Although the bedrock groundwater contaminant plume south of the site would persist over a long

period of time, it would eventually abate. Potential human health exposures to the contaminated groundwater in the interim would be avoided by water treatment and monitoring.

Alternative 7

This alternative would be protective of human health and the environment over the long term. Although the bedrock groundwater contaminant plume south of the site would persist over a long period of time, it would eventually abate. Potential human health exposures to the contaminated groundwater in the interim would be avoided by water treatment and monitoring.

Alternative 8

This alternative would be protective of human health and the environment over the long term. Although the bedrock groundwater contaminant plume south of the site would persist over a long period of time, it would eventually abate. Potential human health exposures to the contaminated groundwater in the interim would be avoided by water treatment and monitoring.

Alternative 9

This alternative would be protective of human health and the environment over the long term. Although the bedrock groundwater contaminant plume south of the site would persist over a long period of time, it would eventually abate. Potential human health exposures to the contaminated groundwater in the interim would be avoided by water treatment and monitoring.

7.2.3. Short-term Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

Alternative 1

Implementation of this alternative would have no short-term adverse impacts. Leachate management would be ongoing for the foreseeable future. This alternative could be implemented immediately.

Alternative 2

Implementation of this alternative would have no short-term adverse impacts. Leachate management, as well as residential well monitoring and maintenance would be ongoing for the foreseeable future. This alternative could be implemented immediately.

Alternative 3A

Implementation of this alternative would have no short-term adverse impacts. Leachate management, as well as residential well monitoring and maintenance would be ongoing for the foreseeable future. This alternative could be implemented immediately.

Alternative 3B

Implementation of this alternative would have no short-term adverse impacts. Leachate management, as well as residential well monitoring and maintenance would be ongoing for the foreseeable future. This alternative could be implemented immediately.

Alternative 4

Normal construction hazards would be associated with the construction of the treatment plant; a higher degree of risk would be present to construction workers during excavation within the disposal site. Controls are available to minimize risks associated with on-site worker exposures. Monitoring would be performed to determine if unacceptable exposures would be generated by site work, and controls are available to minimize off-site impacts. The duration of construction is estimated to be less than one year; the leachate management, groundwater monitoring, and residential well monitoring and maintenance would be ongoing for the foreseeable future.

Alternative 5

Normal construction hazards would be associated with the construction of the treatment plant, and installation of the nearsite bedrock groundwater recovery wells. Controls are available to minimize risks associated with on-site worker exposures. Monitoring would be performed to determine if unacceptable exposures would be generated by site work, and controls are available to minimize off-site impacts. The duration of construction is estimated to be less than one year; the leachate management, groundwater monitoring, and residential well monitoring and maintenance would be ongoing for the foreseeable future.

Alternative 6

Normal construction hazards would be associated with the construction of the treatment plant, and installation of the nearsite bedrock groundwater recovery wells. Controls are available to minimize risks associated with on-site worker exposures. Monitoring would be performed to determine if unacceptable exposures would be generated by site work, and controls are available to minimize off-site impacts. The duration of construction is estimated to be less than one year; the leachate management, groundwater monitoring, and residential well monitoring and maintenance would be ongoing for the foreseeable future.

Alternative 7

Normal construction hazards would be associated with the construction of the treatment plant; a higher degree of risk would be present to construction workers during excavation within the disposal site. Controls are available to minimize risks associated with on-site worker exposures. Monitoring would be performed to determine if unacceptable exposures would be generated by site work, and controls are available to minimize off-site impacts. The duration of construction

is estimated to be less than one year; the leachate management, groundwater monitoring, and residential well monitoring and maintenance would be ongoing for the foreseeable future.

Alternative 8

Normal construction hazards would be associated with the construction of the treatment plant, and installation of the bedrock groundwater recovery wells. Controls are available to minimize risks associated with on-site worker exposures. Monitoring would be performed to determine if unacceptable exposures would be generated by site work, and controls are available to minimize off-site impacts. The duration of construction is estimated to be less than one year; the leachate management, groundwater monitoring, and residential well monitoring and maintenance would be ongoing for the foreseeable future.

Alternative 9

Normal construction hazards would be associated with the construction of the treatment plant; a higher degree of risk would be present to construction workers during excavation within the disposal site. Controls are available to minimize risks associated with on-site worker exposures. Monitoring would be performed to determine if unacceptable exposures would be generated by site work, and controls are available to minimize off-site impacts. The duration of construction is estimated to be less than one year; the leachate management, groundwater monitoring, and residential well monitoring and maintenance would be ongoing for the foreseeable future.

7.2.4. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the controls intended to limit the risk, and 3) the reliability of these controls.

Alternative 1

This alternative would have poor long-term effectiveness. The remaining risks would be significant, as the potential exposures to contaminants within the bedrock groundwater plume would persist. The only control on these risks would be the removal of leachate from the disposal site.

Alternative 2

This alternative would have poor long-term effectiveness. The remaining risks would be significant, as the potential exposures to contaminants within the bedrock groundwater plume would persist. The controls on these risks would be increased removals of leachate from the disposal site, monitoring of the bedrock groundwater contaminant plume and the monitoring and maintenance of the residential well systems. These controls are only partially effective.

Alternative 3A

This alternative would have poor long-term effectiveness. The remaining risks would be significant, as the potential exposures to contaminants within the bedrock groundwater plume would persist. The controls on these risks would be increased removals of leachate from the disposal site, monitoring of the bedrock groundwater contaminant plume and the monitoring and maintenance of the residential well systems. These controls are only partially effective.

Alternative 3B

This alternative would have poor long-term effectiveness. The remaining risks would be significant, as the potential exposures to contaminants within the bedrock groundwater plume would persist. The controls on these risks would be increased removals of leachate from the disposal site, monitoring of the bedrock groundwater contaminant plume and the monitoring and maintenance of the residential well systems. These controls are only partially effective.

Alternative 4

This alternative would have poor long-term effectiveness. The remaining risks would be significant, as the potential exposures to contaminants within the bedrock groundwater plume would persist. The controls on these risks would be increased removals of leachate from the disposal site, monitoring of the bedrock groundwater contaminant plume and the monitoring and maintenance of the residential well systems. These controls are only partially effective.

Alternative 5

This alternative would have moderate long-term effectiveness. The remaining risks would be significant, as the potential exposures to contaminants within the bedrock groundwater plume would persist over a long period of time. The controls on these risks would be increased removals of leachate from the disposal site, recovery of bedrock groundwater in the vicinity of the site (which would allow for declines in contaminant levels in the plume to the south of the site), monitoring of the bedrock groundwater contaminant plume and the monitoring and maintenance of the residential well systems. These controls are somewhat effective.

Alternative 6

This alternative would have moderate long-term effectiveness. The remaining risks would be significant, as the potential exposures to contaminants within the bedrock groundwater plume would persist over a long period of time. The controls on these risks would be increased removals of leachate from the disposal site, recovery of bedrock groundwater in the vicinity of the site (which would allow for declines in contaminant levels in the plume to the south of the site), monitoring of the bedrock groundwater contaminant plume and the monitoring and maintenance of the residential well systems. These controls are somewhat effective.

Alternative 7

This alternative would have moderate long-term effectiveness. The remaining risks would be significant, as the potential exposures to contaminants within the bedrock groundwater plume would persist over a long period of time. The controls on these risks would be the elimination of

contaminant releases from the disposal site (which would allow for declines in contaminant levels in the plume to the south of the site), monitoring of the bedrock groundwater contaminant plume and the monitoring and maintenance of the residential well systems. The controls on migration of contaminants from the disposal site are the most effective, as the disposal site would no longer act as a source of contaminants to the groundwater; overall, the controls are somewhat effective.

Alternative 8

This alternative would have moderate long-term effectiveness. The remaining risks would be significant, as the potential exposures to contaminants within the bedrock groundwater contaminant plume would persist over a long period of time. The controls on these risks would be the removals of leachate from the disposal site, bedrock groundwater recovery and treatment to the south of the site (which would prevent further migration of the plume to additional residential wells), monitoring of the bedrock groundwater contaminant plume, and the monitoring and maintenance of the residential well systems. These controls are somewhat effective.

Alternative 9

This alternative would have good long-term effectiveness. The remaining risks would be significant, as the potential exposures to contaminants within the bedrock groundwater contaminant plume would persist over a period of time. However, the period of time necessary for the risks to be abated would be less for this alternative than for any of the above alternatives. The controls on these risks would be the elimination of contaminant releases from the disposal site, bedrock groundwater recovery and treatment to the south of the site, monitoring of the bedrock groundwater contaminant plume, and the monitoring and maintenance of the residential well systems. The controls on migration of contaminants from the disposal site are the most effective, as the disposal site would no longer act as a source of contaminants to the groundwater; overall, the controls are somewhat effective.

7.2.5. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

Alternative 1

Reduction of toxicity, mobility, or volume of wastes at the site would be through utilization of the containment system at the site, which would impede the movement of contaminants from the disposal site, and by the treatment of the leachate removed from the site.

Alternative 2

Reduction of toxicity, mobility, or volume of wastes at the site would be through utilization of the containment system at the site, which would impede the movement of contaminants from the disposal site, and by the treatment of the leachate removed from the site.

Alternative 3A

Reduction of toxicity, mobility, or volume of wastes at the site would be through utilization of the containment system at the site, which would impede the movement of contaminants from the disposal site, and by the treatment of the leachate removed from the site.

Alternative 3B

Reduction of toxicity, mobility, or volume of wastes at the site would be through utilization of the containment system at the site, which would impede the movement of contaminants from the disposal site, and by the treatment of the leachate removed from the site.

Alternative 4

Reduction of toxicity, mobility, or volume of wastes at the site would be through utilization of the enhanced containment system at the site, which would impede the movement of contaminants from the disposal site, and by the treatment of the leachate removed from the site.

Alternative 5

Reduction of toxicity, mobility, or volume of wastes at the site would be through utilization of the containment system at the site, and the nearsite groundwater recovery wells, which would impede the movement of contaminants from the disposal site, and by the treatment of the leachate removed from the site.

Alternative 6

Reduction of toxicity, mobility, or volume of wastes at the site would be through maximum utilization of the containment system at the site, and the nearsite groundwater recovery wells, which would impede the movement of contaminants from the disposal site, and by the treatment of the leachate removed from the site.

Alternative 7

Reduction of toxicity, mobility, or volume of wastes at the site would be through utilization of the hydraulic containment system at the site, which would prevent the movement of contaminants from within the disposal site, and by the treatment of the leachate removed from the site.

Alternative 8

Reduction of toxicity, mobility, or volume of wastes at the site would be through utilization of the containment system at the site, which would impede the movement of contaminants from the disposal site, and by the treatment of the leachate removed from the site as well as treatment of the bedrock groundwater recovered south of the disposal site.

Alternative 9

Reduction of toxicity, mobility, or volume of wastes at the site would be through utilization of the hydraulic containment system at the site, which would prevent the movement of

contaminants from the disposal site, and by the treatment of the leachate removed from the site, as well as treatment of the bedrock groundwater recovered south of the disposal site.

7.2.6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction and the ability to monitor the effectiveness of the remedy. For administrative feasibility, the availability of the necessary personnel and material is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, etc..

Alternative 1

This alternative is implementable, as no additional work would be done.

Alternative 2

This alternative is implementable, no construction work would be done, the remedy would be monitorable, and personnel/materials are readily available.

Alternative 3A

This alternative is implementable. Standard construction techniques and water treatment processes would be used. The remedy would be monitorable, and personnel/materials are readily available. Authorization for discharge of treated waters would not be difficult to obtain.

Alternative 3B

This alternative is implementable, no construction work would be done, the remedy would be monitorable, and personnel/materials are readily available.

Alternative 4

This alternative is implementable. Standard construction techniques and water treatment processes would be used in the water treatment facility. Specialized techniques would be required for construction of the enhanced leachate collection system. Personnel and materials would be readily available, and the remedy would be monitorable. Authorization for discharge of treated waters would not be difficult to obtain.

Alternative 5

This alternative is implementable. Standard construction techniques and water treatment processes would be used. The remedy would be monitorable, and personnel/materials are readily available. Authorization for discharge of treated waters would not be difficult to obtain.

Alternative 6

This alternative is implementable. Standard construction techniques and water treatment processes would be used. The remedy would be monitorable, and personnel/materials are readily available. Authorization for discharge of treated waters would not be difficult to obtain.

Alternative 7

This alternative is implementable. Standard construction techniques and water treatment processes would be used in the water treatment facility. Specialized techniques would be required for construction of the enhanced leachate collection system. Personnel and materials would be readily available, and the remedy would be monitorable. Authorization for discharge of treated waters would not be difficult to obtain.

Alternative 8

This alternative is implementable. Standard construction techniques and water treatment processes would be used. The remedy would be monitorable, and personnel/materials are readily available. Authorization for discharge of treated waters would not be difficult to obtain. Access agreements for implementation of the bedrock groundwater recovery system would be required.

Alternative 9

This alternative is implementable. Standard construction techniques and water treatment processes would be used. Specialized techniques would be required for construction of the enhanced leachate collection system. The remedy would be monitorable, and personnel/materials are readily available. Authorization for discharge of treated waters would not be difficult to obtain. Access agreements for implementation of the bedrock groundwater recovery system would be required.

7.2.7. Cost. Capital and operation and maintenance costs are estimated for each alternative and compared on a present worth basis. Although cost is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the remaining criteria, cost effectiveness can be used as the basis for the final decision. The costs for each alternative are presented in Table 2.

7.2.8 Community Acceptance - Concerns of the community regarding the RI/FS reports and the Proposed Remedial Action Plan have been evaluated. The "Responsiveness Summary" included as Appendix A presents the public comments received and the Department's response to the concerns raised. The comments received on the proposed plan were related to the relative impacts and benefits of the different remedial alternatives, an alleged alternative source of contaminants, the potential impacts and benefits of complete removal of the disposal site, and other issues. Please see the attached Responsiveness Summary for the detailed discussion of the comments received, and responses.

SECTION 8: SUMMARY OF THE SELECTED REMEDY

Based upon the results of the RI/FS, and the evaluation presented in Section 7, the NYSDEC is selecting Alternative 9, Disposal Site Hydraulic Containment with Downgradient Groundwater Recovery and Treatment, as the remedy for this site.

This selection is based upon the Department's findings that Alternative 9 will be most protective of human health and the environment, will comply with SCGs more quickly, has good short-term effectiveness, has the highest long-term effectiveness, and is implementable.

Alternatives 1, 2, 3A, 3B, and 4 are not protective of human health and the environment, as the disposal site would continue to act as a continuing source of contamination to the groundwater beneath the site, and the bedrock groundwater contaminant plume would not be addressed.

Alternatives 5, 6 and 8 have a lesser long-term effectiveness and permanence.

Alternative 7 would result in the disposal site no longer acting as a source of contaminants to the groundwater; however, no additional controls would be implemented to address the contaminants within the plume in the bedrock to the south of the site.

Alternative 9 will allow for the shortest time period to achieve SCGs (groundwater and drinking water standards).

Alternative 9 also has the highest degree of reduction in toxicity, mobility and volume of contaminants. This results in alternative 9 being the most likely to prevent additional homeowner wells from being impacted by the bedrock groundwater contaminant plume.

The estimated present worth cost to implement the remedy is \$8.6 million. The cost to construct the remedy is estimated to be \$3.33 million, and the estimated average annual operation and maintenance cost is \$344,000.

The elements of the selected remedy are as follows:

1. A remedial design program to verify the components of the conceptual design and provide the details necessary for the construction, operation and maintenance, and monitoring of the remedial program. Any uncertainties identified during the RI/FS would be resolved.
2. Installation and operation of a new leachate collection system within the disposal site to allow for hydraulic containment of waters within the disposal site.
3. Construction and operation of a new wastewater treatment facility at the site to manage leachate and groundwater generated as part of the site remedy.
4. Installation and operation of a bedrock groundwater recovery well system south of the site to control migration of the contaminant plume and to accelerate the time needed to meet groundwater and drinking water standards in the bedrock groundwater.

5. Monitoring and maintenance of the residential well treatment systems until the groundwater in the vicinity of the residences consistently meets groundwater and drinking water standards.
6. Maintenance of the disposal site, including mowing of the cap, fence inspection and repairs as needed, cap inspection and repairs as needed, and drainageway inspection and repairs as needed.
7. Since the remedy results in untreated hazardous waste remaining at the disposal site, a long term monitoring program would be continued. There would be several elements to the monitoring program. They are:
 - monitoring of water levels within and in the vicinity of the disposal site to evaluate the effectiveness of the new leachate collection system in achieving hydraulic containment of the disposal site;
 - monitoring of the groundwater quality in the vicinity of the disposal site and in the vicinity of the bedrock groundwater contaminant plume, to allow for evaluations of the effectiveness of the remedial program;
 - monitoring of nearby residential wells in the vicinity of the bedrock groundwater contaminant plume, to allow for identification of potential exposures to the contaminants within the bedrock contaminant plume.

This program will allow the effectiveness of the remedy to be monitored and would be a component of the operation and maintenance for the site.

SECTION 9: HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the remedial investigation process, a number of Citizen Participation activities were undertaken in an effort to inform and educate the public about conditions at the site and the potential remedial alternatives. The following public participation activities were conducted for the site:

- A repository for documents pertaining to the site was established.
 - A site mailing list was established which included nearby property owners, local political officials, local media and other interested parties
 - A Fact Sheet was mailed to the parties on the mailing list in November 1999 which described the results of the RI/FS for the site, described the remedial alternatives and the evaluation of the alternatives, presented the preferred remedial alternative identified in
-

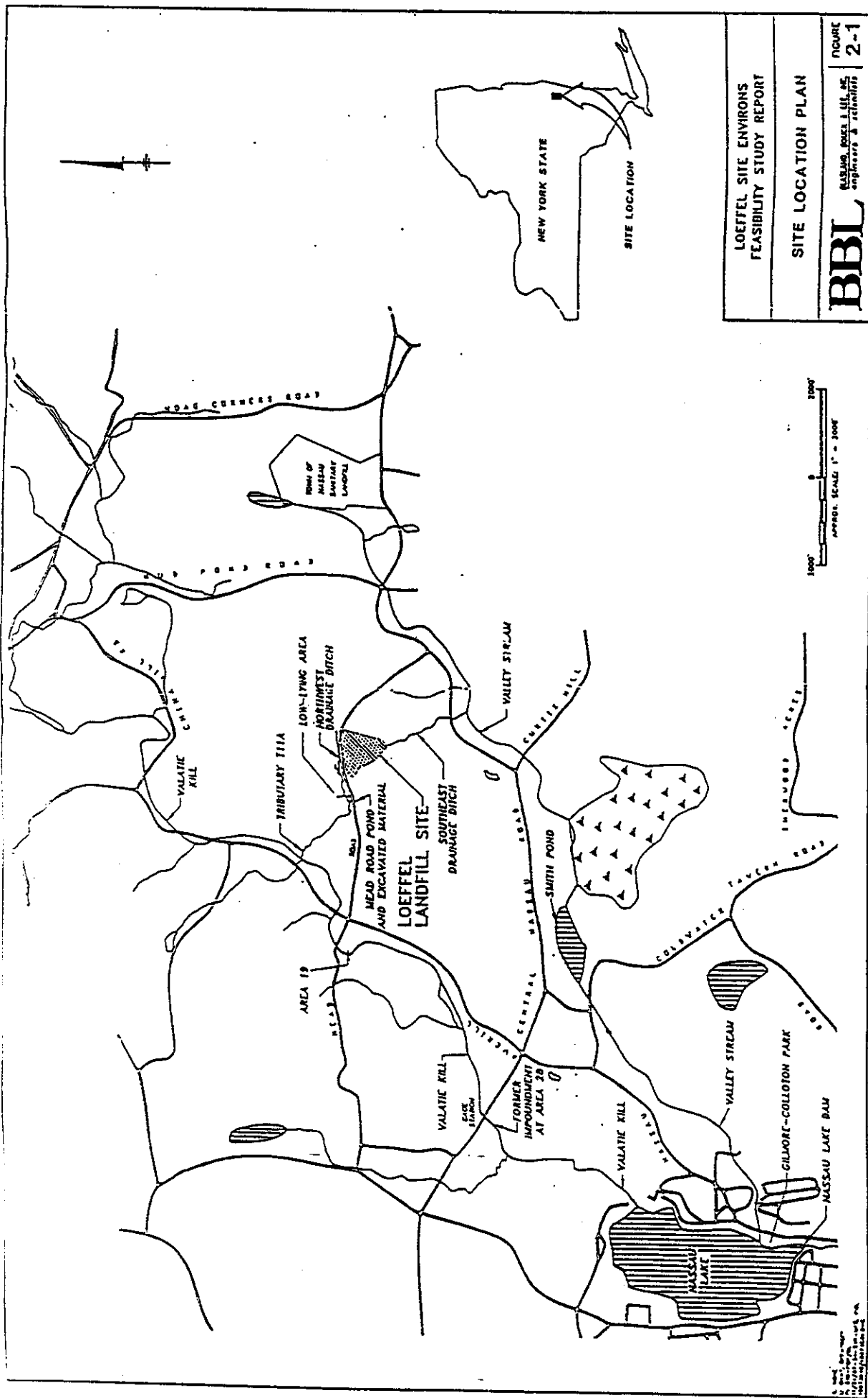
the Proposed Remedial Action Plan, and announced the availability session and public meeting.

- An availability session was held from 3 pm to 5 pm on December 1, 1999 to answer questions from the public in an informal setting.
- A public meeting was held from 7 pm to 10 pm on December 1, 1999 to present the results of the RI/FS for the site, to describe the remedial alternatives and the evaluation of the alternatives, to present the preferred remedial alternative identified in the Proposed Remedial Action Plan, and to answer questions from the public.
- In January 2001, a Responsiveness Summary was prepared and made available to the public, to address the comments received during the public comment period for the PRAP.

Dewey Loeffel Site

Figure 1

Site Location Map



LOEFFEL SITE ENVIRONS
FEASIBILITY STUDY REPORT

SITE LOCATION PLAN

BBL
BUSHAW, BOWEN & LEE, INC.
engineers & scientists

FIGURE
2-1

Dewey Loeffel Site

Figure 2

Site Layout

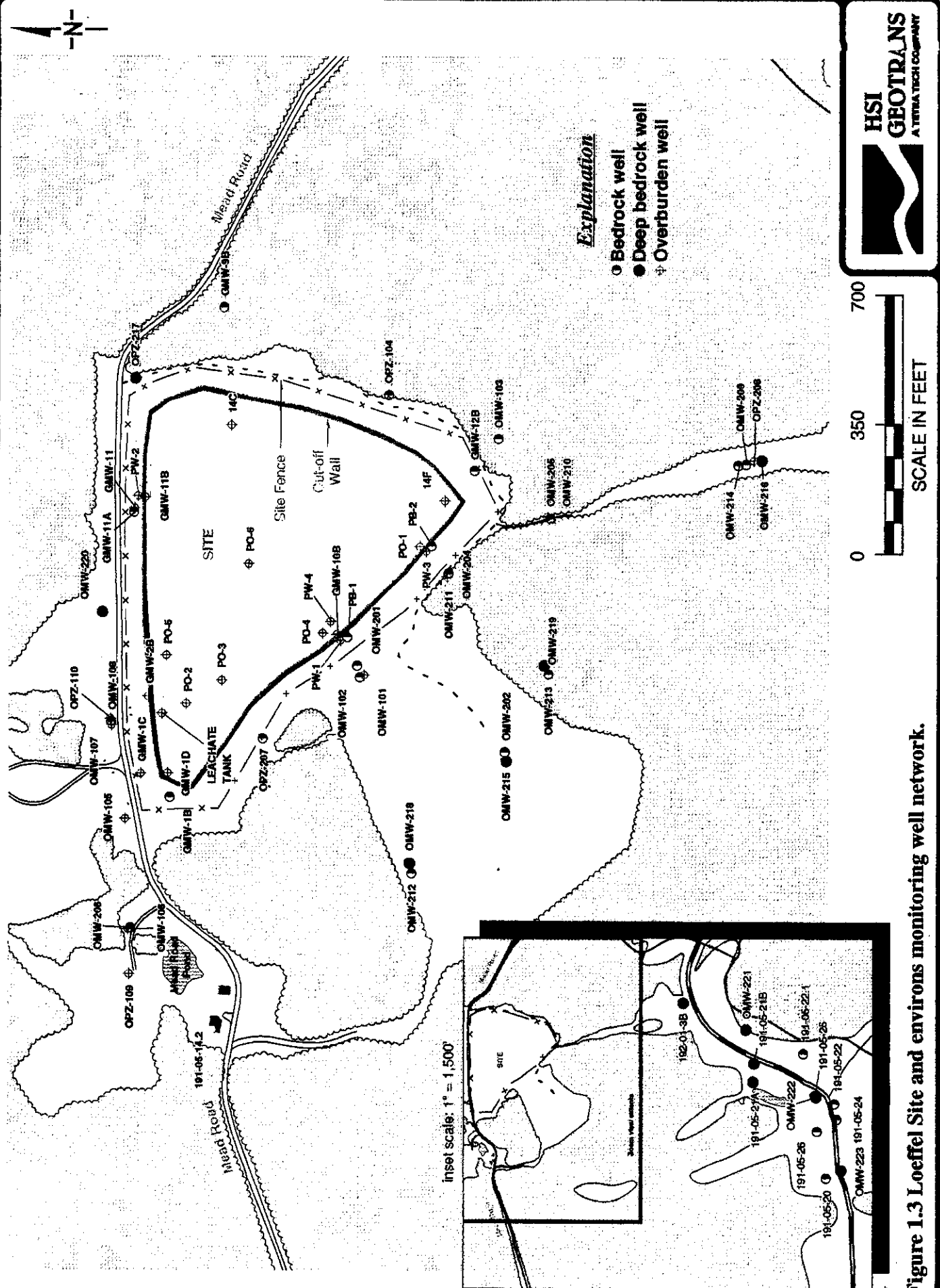


Figure 1.3 Loeffel Site and environs monitoring well network.

Table 1
Nature and Extent of Contamination

MEDIA	CLASS	CONTAMINANT OF CONCERN	CONCENTRATION RANGE (ppb for water, ppm for soil)	SCG (ppb for water, ppm for soils)
Groundwater	Polychlorinated Biphenyls (PCBs)	Aroclor 1242	ND to 0.25	0.09
		Aroclor 1260	ND to 0.35	0.09
Groundwater	Volatile Organic Compounds (VOCs)	Benzene	ND to 52,000	1
		Chlorobenzene	ND to 5600	5
		Chloroform	ND to 24	7
		1,3-Dichlorobenzene	ND to 4.3	3
		1,2-Dichloroethane	ND to 240	0.6
		cis-(1,2) Dichloroethene	ND to 22,000	5
		1,4-Dichlorobenzene	ND to 7.6	3
		1,2-Dichlorobenzene	ND to 4.3	3
		Ethyl Benzene	ND to 23	5
		Methylene Chloride	ND to 3300	5
		Toluene	ND to 56,000	5
		Trichloroethene	ND to 1200	5
		Vinyl Chloride	ND to 47	2
		Total xylenes	ND to 2100	5
Groundwater	Semivolatile Organic Compounds (SVOCs)	Phenol	ND to 1300	1*
		2-chlorophenol	ND to 65	1*
		2-methyl phenol	ND to 340	1*
		4-methyl phenol	ND to 3500	1*
		2,4-dimethyl phenol	ND to 140	1*

* applies to the sum of phenolic compounds

Table 2
Remedial Alternative Costs
(Costs in dollars)

Remedial Alternative	Capital Cost	Annual O&M	Total Present Worth
Alternative 1: No Further Action	0	71,300	1,096,000
Alternative 2: Hydraulic Control	0	182,700	2,931,000
Alternative 3A: Enhanced Hydraulic Control with Off-Site Leachate Disposal	0	296,000	4,551,000
Alternative 3B: Enhanced Hydraulic Control with On-Site Treatment	1,009,493	190,182	3,933,000
Alternative 4: Enhanced Hydraulic Control with Expanded Collection and On-Site Treatment and Disposal	1,725,622	314,411	6,558,905
Alternative 5: Near Site Pump and Treat System	976,100	223,000	4,403,200
Alternative 6: Increased Leachate Collection with Near Site Groundwater Recovery and Treatment	1,695,700	260,000	5,690,500
Alternative 7: Disposal Site Hydraulic Containment	3,002,000	331,000	8,092,000
Alternative 8: Leachate Extraction and Downgradient Groundwater Recovery and Treatment	1,305,539	253,350	4,891,175
Alternative 9: Disposal Site Hydraulic Containment with Downgradient Groundwater Recovery and Treatment	3,331,049	343,431	8,609,583

APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

**Dewey Loeffel Site
Operable Unit 2
Town of Nassau, Rensselaer County
Site No. 442006**

The Proposed Remedial Action Plan (PRAP) for the Dewey Loeffel Site was prepared by the New York State Department of Environmental Conservation (NYSDEC) and issued to the local document repository on November 8, 1999. This Plan outlined the preferred remedial measure proposed for the remediation of the contaminated soil and sediment at the Dewey Loeffel site. The preferred remedy is Alternative 9, Disposal Site Hydraulic Containment with Downgradient Groundwater Recovery and Treatment.

The release of the PRAP was announced via a notice to the mailing list, informing the public of the PRAP's availability.

A public meeting was held on November 30, 1999 which included a presentation of the Remedial Investigation (RI) and the Feasibility Study (FS) as well as a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site. Written comments were received from General Electric Company, Town of Nassau, Nassau Lake Park Improvement Association, Rensselaer County Environmental Management Council and two local residents (Lever, Tolcser). The public comment period for the PRAP ended on February 7, 2000 following a 60-day extension to the 30 day public comment period.

This Responsiveness Summary responds to all questions and comments raised at the November 30, 1999 public meeting and to the written comments received.

Comments from GE on Loeffel OU2 PRAP

Comment GE-1:

p.2-3: "Construction and operation of an expanded and deepened leachate collection system inside the current containment wall of the landfill would cause significant lowering of the water below its current levels. This dewatering has the potential to mobilize NAPL, possibly allowing some of the NAPL to escape from the landfill into the Site environs".

Response GE-1:

In the Feasibility Study Addendum (June 3, 1998) for this site, prepared for GE by HSI GeoTrans, the statement was made on p. 18 describing the impacts of the installation of the proposed leachate collection drains within the disposal site, "...the potential exists for remobilization of wastes due to dewatering and the physical installation of the drains." However, on p. 19-20, the statement is also made, in referring to the reduction in toxicity, mobility and

volume of the wastes at the site which would be achieved by installation of the proposed leachate collection drains, "This remedial alternative would reduce the mobility and volume of leachate at the Loeffel Site through increased leachate collection rates. The toxicity of the extracted leachate would be reduced through on-site treatment prior to discharge."

The Department believes that the installation of the proposed leachate drains is an effective means to control the migration of contaminants from within the disposal site to the underlying bedrock. As stated in the FS, even though some of the wastes at the site may be induced to move by the operation of the proposed leachate collection drains, the mobility of the leachate would be reduced by operation of the drains, and would be collected for treatment.

Comment GE-2:

P. 3: "In addition, water quality data from wells within the landfill show that several compounds have been detected at relatively high concentrations. It is also likely that the metal debris remaining in the landfill would contribute to high concentrations of inorganic compounds in the collection system leachate. During the operation of the expanded and deepened leachate collection system, it is likely that there would be significant temporal variability in the concentration of several compounds, both organic and inorganic. This temporal variability is likely to affect the effectiveness and efficiency of the leachate treatment system."

Response GE-2:

In the Feasibility Study Addendum, on p. 23, in the discussion of the reliability of the technology to be used to treat the leachate, GE's consultant HSI GeoTrans stated that "Leachate extraction is a frequently used alternative that has proven effective in meeting certain objectives. Oil/water separation, filtration, chemical precipitation, coagulation and flocculation, sludge dewatering, air stripping, and activated carbon have frequently been used and proven effective in other applications." Based on that document and Department experience at other sites, the Department believes that the proposed leachate collection and treatment system will be implementable and effective in managing the leachate recovered from within the disposal site.

Comment GE-3:

P. 3: "Has the Department considered the possibility of NAPL mobilization during construction and operation of the expanded and deepened leachate collection system and its effect on off-site groundwater? If so, what are its conclusions?"

Response GE-3:

The potential for NAPL (non-aqueous phase liquid) mobilization from within the Loeffel disposal site is a function of several factors including:

- (1) Whether the NAPL is lighter than water (a LNAPL) or denser than water (a DNAPL).**
- (2) The location within the landfill where the NAPL is likely to be located in significant amounts.**
- (3) Changes to current conditions which would cause the NAPL to be mobilized.**

(4) The fate of any mobilized NAPL.

Nearly all of the liquid wastes disposed at the site are light non aqueous phase liquids (LNAPLs). LNAPLs which could be mobilized by construction or operation of the new leachate collection drains could be collected in the drains themselves, as the LNAPLs would follow the gradient along the water table, which would be lowest at the drains. The LNAPLs could then be collected for treatment.

Changes to current conditions which could mobilize NAPLs include physical disturbance of the soils or containers containing the NAPLs. During construction of the leachate collection system, no excavation work will be done in or near the area within the disposal site which is more likely to contain significant amounts of NAPLs (the easternmost portion of the site; see response to comment GE-4, below). It is, then, unlikely that the construction of the leachate collection drains will mobilize NAPLs. However, if some NAPLs are encountered in the excavations, then they could be collected for treatment.

A second change to current conditions which could mobilize NAPLs is the operation of the new leachate collection system, which will result in dewatering of a significant portion of the disposal site volume which is currently saturated. However, as (1) the drains will not be installed in the portion of the site likely to contain significant amounts of NAPLs; and (2) the leachate collection system will likely not dewater a significant portion of the easternmost area of the site (the drains will not be in that area, and the eastern most portion of the site is where there is significant inward flow of groundwater from the bedrock into the disposal site), it is unlikely that NAPLs would be mobilized. Also, the operation of the system (how much and where the desired pumping of leachate would occur) can be tailored during design and startup to minimize the potential for NAPL mobilization.

Another scenario that must be accounted for is the possibility that there are dense non-aqueous phase liquids (DNAPLs) in the easternmost portion of the disposal site which could be mobilized. DNAPLs would not flow easily toward the leachate collection system as would LNAPLs, as DNAPLs would sink through the water within the disposal site rather than float upon it. In order to avoid the possibility that a mobilization of DNAPLs could occur, the Department will ensure that there is no physical disturbance of the easternmost portion of the disposal site, as well as to design and operate the new leachate collection system such that there are no significant changes to the water levels within the easternmost portion of the disposal site. As there is a large upward hydraulic gradient in this portion of the site from the underlying bedrock into the disposal site, no reductions in water level are necessary in this portion of the disposal site.

Comment GE-4:

P. 3: "Has the Department evaluated the areas within the landfill most likely to contain potentially mobile NAPL? If so, what are the conclusions?"

Response GE-4:

The Department believes that the area within the disposal site which is most likely to contain

mobile NAPL is the easternmost portion of the disposal site, which is where the waste was actually disposed as bulk liquids to pits, and in drums. No excavation activities are to take place in this portion of the site to install the leachate collection drains, so no physical disturbance will occur which could mobilize NAPLs.

Comment GE-5:

P. 3: "What contingencies did the Department consider that could be implemented in the event of NAPL mobilization and migration from the containment system?"

Response GE-5:

In the unlikely event that NAPLs are mobilized, and actually migrate away from the containment system, any impacts on the bedrock groundwater would be detected in the numerous monitoring wells immediately south of the disposal site. The Department could then alter the operation of the leachate collection system to abate the releases from the site. Varying the pumping rates and pulse pumping are examples of how the leachate collection system operation could be altered to abate any releases from the site. The downgradient bedrock groundwater extraction wells would also act as a barrier to contaminant migration south to the vicinity of the homeowner wells.

Comment GE-6:

P. 3: Has the Department considered the possibility that leachate concentrations could show considerable variability, and might affect the effectiveness and efficiency of the proposed treatment system? If so, what are its conclusions?

Response GE-6:

As stated above in response to comment GE-2, the Department believes that the proposed leachate collection and treatment system will be implementable and effective in managing the leachate recovered from within the disposal site. The Feasibility Study Addendum, submitted by GE's consultant, generally supports this view.

Comment GE-7:

P. 4: "What contingencies did the Department consider to respond to significant variability in leachate concentrations, including NAPL emulsions and inorganic compounds such as iron, and to prevent exceeding leachate treatment system discharge criteria?"

Response GE-7:

As stated above in response to comment GE-2, the Department believes that the proposed leachate collection system will be implementable and effective in managing the leachate recovered from within the disposal site. The Feasibility Study, submitted by GE's consultant, supports this view.

Comment GE-8:

P. 4: "If the data show there is an additional source(s) of VOC contamination located south of the landfill, then the PRAP-proposed extraction wells would not be an effective remedial action to mitigate the contaminant concentrations in the residential wells located south of the landfill."

Response GE-8:

The locations of the proposed extraction wells, which are south of the landfill, would address any hypothetical additional sources of VOCs in the area discussed in the comment. If GE knows of any additional sources of VOCs in this area, they should have been identified over the course of the investigations of this site.

Comment GE-9:

P. 4: "The PRAP has disregarded the evidence that natural attenuation is a viable remedial alternative for the landfill derived VOC contamination in the bedrock south of the landfill."

Response GE-9:

The Department has not disregarded natural attenuation as a potentially viable remedial alternative; however, the reliance upon natural attenuation alone to prevent migration of contaminants to nearby homeowner wells would be unreliable, given the uncertainties associated with migration of contaminants through a faulted and fractured bedrock system.

The selected remedy is appropriate to protect nearby threatened homeowner wells from potential further migration of the contaminant plume.

Comment GE-10:

P. 5: "The data down in Table 1 indicate that the contamination in wells 191-05-21A & B comes from a separate source(s), one that is distinct from the landfill and unrelated to wastes attributed to GE. The reasons for these conclusions are as follows:"

1. The TCE concentration of 730 ug/l measured in 191-05-21B (shallow) well was higher than the TCE concentration measured in any other monitoring well sampled at the site in 1999. This has been the case historically. The next highest TCE concentration measured in 1999 was 670 ug/l, measured in OMW-204, which is nearest the landfill. TCE values in the other monitoring wells downgradient of the landfill did not exceed 6 ug/l. It is not reasonable to see TCE concentrations 2400 feet downgradient from the landfill that are higher than measured concentrations in the landfill itself, unless a separate source exists. GE believes that the Department has not given adequate attention to the issue of additional sources and should address this issue thoroughly in its responsiveness summary.

In particular,

1. Has the area surrounding 191-05-21A & B been evaluated and physically inspected by DEC for additional sources?
 2. What is the basis for the assumption that the contaminants sampled in 191-05-21B are coming from the landfill and not a separate source(s).
 3. If the Department does not agree that a separate source (s) exists, what alternative explanation is there for the contaminant distribution and increase in concentrations in Well 191-05-21B?
2. TCE in the landfill is accompanied by the presence of reductive dechlorination daughter products, such as VC and cis-dichloroethylene ("c-DCE"). In particular, c-DCE levels in

OMW-204 and OMW-211 are an order of magnitude higher than TCE in those wells, indicating that the TCE in the landfill is undergoing significant biodegradation. C-DCE was not widely manufactured and is considered a clear signature of intrinsic biodegradation. Similar levels of c-DCE are not present with the TCE in wells 191-05-21A & B. In fact, the ratios of c-DCE and TCE in these wells are among the lowest found anywhere on the site, suggesting these contaminants are distinct from those in the landfill and have not yet undergone significant reductive dehalogenation. The Department should provide a clear explanation of its analysis of these data.

3. The contaminant mix in the 191-05-21A & B wells contains other compounds that biodegrade very rapidly and would not be expected to travel far in the subsurface. These include chloroform and dichloromethane ("DCM") or methylene chloride. Although these are also present in the landfill, with one exception, DCM in OMW-216, which was also noted in the trip blank, indicating laboratory contamination), they are not present in the downgradient wells shown in Table 1. It is improbable that these highly biodegradable compounds could travel 2400 feet in the subsurface without undergoing extensive attenuation due to biodegradation. Once again, the presence of these parent compounds in the residential wells strongly suggests an additional contamination source. The Department should provide a clear explanation of its analysis of these data as well.
4. Contaminant concentrations (represented by TCE values) are increasing substantially with time in well 191-05-21B (shallow). Statistical analysis of the regression data indicates that this increase in TCE concentration is statistically significant at the 95% confidence level. Similar increases are not seen in other wells listed in Table 1. Once again, it is highly unlikely that such an increase would appear in well 191-05-21B and not in the landfill or in wells located between the landfill and Central Nassau Road, unless there is an additional source(s) of contamination. Again, the Department should provide a clear explanation of its analysis of this data.

Response GE-10:

The history of releases of contaminated groundwater from the Loeffel disposal site is not well documented. The pattern of contaminants found in wells throughout the area impacted by releases from the Loeffel site is highly variable, both temporally and spatially. Simply because the mix of contaminants is not exactly the same as what is presently observed about the landfill and at wells 191-05-21 A & B near Central Nassau Road, does not indicate that a separate source is responsible for the contamination in the wells identified in the comment above. Also, as the bedrock in the vicinity of the site and the private wells is highly fractured and faulted, the transport of contaminants in the bedrock will likely not be as regular and predictable as in a homogeneous and isotropic aquifer. In short, it is to be expected in an aquifer of this nature that the distribution of the contaminants could be relatively unpredictable and irregular.

Responding to specific questions in reasons 1-4 above:

1. On the issue of relative TCE concentrations between the vicinity of the landfill and the impacted private wells: As discussed in the paragraph above, due to the unknown history

of releases from the disposal site, and the nature of the bedrock (highly fractured and faulted) it is not unreasonable to see an irregular distribution of contaminants in the contaminant plume.

The area surrounding the private wells in question has been evaluated by the Department. In fact, the pond on the property, and the septic tanks on the property, have been sampled and found not to contain the contaminants found in the contaminant plume.

The basis for the Department's understanding of the distribution of contaminants in the subsurface in the vicinity of the Dewey Loeffel site includes:

- the nature of the disposal site (a large disposal site with long-term use, and an unknown history of subsurface releases from the site to the bedrock);
- the nature of the soils and bedrock underlying the site area (the specific groundwater flow paths are difficult to predict due to the fractures and fault in the bedrock);
- the spatial orientation of the bedrock fault, which is oriented roughly north-south;
- the finding of the common contaminants in the disposal site, in monitoring wells, and the private wells;

A more reasonable explanation for the increase in concentrations in well 191-05-21B is that the operation of the private wells on that property has changed over time; the shallow well is now pumped more than in the past.

2. The relative absence of the products of TCE degradation (c-DCE, for example) in the private wells is likely due to the relatively low levels of other hydrocarbons in the vicinity of the private wells, which aid in the reductive dechlorination of TCE. As stated above, the variation in contaminant distribution is to be expected at this site.
3. Low levels of chloroform and methylene chloride are very commonly found as lab contaminants in samples analyzed for VOCs. Their presence or absence at low levels should not be used as significant factors in determining contaminant plume characteristics.

The suggestion that the compounds in question would have biodegraded before reaching the private wells in question does not take into account that the flow path, and time of travel, along the contaminant plume, is not well constrained. In other words, it is not known if these compounds would have degraded or not, based upon existing information.

4. As stated above, a likely explanation for the trend in TCE concentrations found in the private well in question is related to increased pumping from the well in recent years.

Comment GE-11:

P. 8: "The Department should provide a clear explanation of its analysis of these data and a clear articulation of its views on natural attenuation. Given the hydrogeological uncertainties present

at the site, what evidence does the Department have that a downgradient extraction system would be more effective at containing the plume than natural attenuation, particularly if the landfill source is intercepted?"

Response GE-11:

The length of time between the start of the disposal site source control measures and the resulting effect on plume migration is undefined and unknown. As the Department stated in the PRAP, the downgradient extraction system is the most reliable remedial measure to prevent additional homeowner wells from being impacted by the bedrock groundwater contaminant plume, by limiting plume migration through active plume management.

Reliance on natural attenuation alone would threaten the consumers of water from the homeowner wells with potential exposures for an undetermined period of time after startup of the disposal site remedial efforts.

Comment GE-12:

P. 9: Prior to installation of a downgradient extraction system, a near landfill containment system should be installed and evaluated to avoid construction of an unnecessary and ineffective downgradient extraction system.

Response GE-12:

The downgradient extraction system is neither unnecessary nor ineffective. As stated in the Response to GE-9 above, the reliance upon natural attenuation alone to prevent migration of contaminants to nearby homeowner wells would be unreliable, given the uncertainties associated with migration of contaminants through a faulted and fractured bedrock system. The selected remedy is appropriate to protect nearby threatened homeowner wells from potential further migration of the contaminant plume.

Comments from the Town of Nassau:

Comment TN-1:

The Town is pleased that the Department's proposed Remedial Plan and Alternative 9 addresses many of the comments presented in the Town's letter dated November 12, 1998. We believe that this Remedial Plan is "going in the right direction". However, as indicated in our November 12, 1998 letter it remains our strong view that the Department should consider, review, and address as an alternative, the excavation, removal, disposal and treatment of the hazardous material that has been placed within the landfill.

Response TN-1:

Based on comments at the public meeting the Department has performed preliminary evaluations of the costs associated with removal, treatment and disposal of the waste in the disposal site. In summary, three scenarios were developed as follows:

Alternative 10A: Off-site disposal (incinerate) - excavate, transport and incinerate all contaminated soil at a capital cost of \$770,672,000.

Alternative 10B: Off-site disposal (incinerate/landfill) excavate, transport and incinerate or landfill as appropriate all contaminated soil at a capital cost of \$269,101,000.

Alternative 11: Exsitu on-site high temperature thermal desorption; excavate and treat all contaminated soil and replace cleaned soil at a capital cost of \$116,494,000.

The preliminary cost estimates were developed with the level of detail required for remedial alternative selection. In fact, many of the cost factors from GE's own report were used, in addition to other data available to the Department. In addition to being cost prohibitive, potential worker exposure and environmental risk associated with the physical removal of the soil, would negatively impact the implementability of these alternatives.

A capital cost analysis of alternatives 10A, 10B and 11 can be found in Attachment 1.

Comment TN-2:

The Department's further review and assessment of Alternative 9 should give special consideration to the impact of leachate removal on the water level of downgradient wells. The Town is concerned that leachate removal may lower the water level in downgradient wells. If necessary the Department's plans should provide for groundwater injection of treated leachate to provide for recovery of down gradient wells.

Response TN-2:

The Department will ensure that the remedial design, and operation of the remedial systems, will not adversely impact the availability of sufficient groundwater for domestic purposes in the areas which could be impacted by the remedial systems. Groundwater modeling and/or pumping tests of new or existing wells during the design phase would be the likely means of ensuring that domestic supplies are not impacted by the operation of the system.

Comment TN-3:

The Department's further review should also assess the impact of the proposed "stripping" treatment technology of air emissions.

Response TN-3:

The Department will ensure that the remedial design, and operation of the remedial systems, will not adversely impact air quality. All laws and regulations pertaining to air quality will be complied with.

Comment TN-4:

The Final Action Plan should provide detail to describe how on-going monitoring will be provided to demonstrate the performance of contractors responsible for long term "Operation and Maintenance" of the leachate pumping and treatment system.

Response TN-4:

Although the final Operation and Maintenance Plan will not be developed until the Remedial Design is performed, the elements of the plan can be found on p. 34-35 of the Record of Decision text.

Comment TN-5:

The Town recommends that the New York State Health Department provide a commitment, at the request of any property owner, to conduct new or additional testing of private residential wells as necessary to answer any questions or concerns raised by property owners.

Response TN-5:

DOH periodically receives requests from homeowners outside the area where private drinking water supplies are routinely monitored. Each request is given careful consideration and the value of sampling is discussed with the homeowner. A determination is then made as to the need for a sample at that location. This process will continue as long as necessary.

Comment TN-6:

Will the Town be provided with monitoring results as proposed in the Final Action Plan?

Response TN-6:

If the Town desires to be on the distribution list for monitoring reports, this can be done.

Comment TN-7:

What will the effects of the Proposed Remedial Action Plan have on the structure of the site?

Response TN-7:

The selected remedy, once constructed, will result in the installation of the new below ground surface leachate collection drains. To accomplish this, the cap will have to be opened in the area where the drains will be located. Once the drains are installed, the cap in that area will be reinstalled and that area will be revegetated. That is the only structural disruption anticipated.

Comment TN-8:

The Town wishes to restate its significant interest in the Department's continuing review of the "Loeffel Site Environs Feasibility Study Report: Nassau Lake Drainage Basin", prepared by BBL, and dated May 13, 1999. The Town requests an opportunity to discuss the Department's proposed Action Plan on this report as soon as such information is available.

Response TN-8:

The Town will be informed when the Proposed Remedial Action is prepared for this portion of the remedial program for the Dewey Loeffel site.

Comments of the Nassau Lake Park Improvement Association, Inc:

Comment NLPIA-1:

It was requested at the public meeting that the Department of Environmental Conservation

(DEC) consider a total clean-up remedial action, i.e. removal and proper disposal of all hazardous wastes contained within the landfill and at all "hotspots" outside the landfill. A total clean-up of the wastes would be more protective of human health than any option evaluated (including DEC's proposed remedy) as presented in the August 1999 Proposed Remedial Action Plan (which was distributed at the 11/30/99 public meeting). The total clean-up option is technically practicable and would be most effective in preventing any additional future impact. Anything less places near-by residences at risk from groundwater contamination and other residences at risk from groundwater and surface water (e.g., Valley Stream) contamination.

Response NLPIA-1:

Please see response TN-1.

Comment NLPIA-2:

At the meeting, it was stated that funding from the responsible party will be pursued for the remedy selected. Although we concur that the responsible party should pay for the clean-up, there should be no further delay in implementing a remedial action because of further negotiations with the responsible party. It was stated at the meeting that Superfund monies are available for clean-up and they should be used if the responsible party balks at providing funds for the selected remedy. The State can then pursue an action against the responsible party for replenishing the Superfund for the project cost.

Response NLPIA-2:

The Department will go forward with the remedial program for this site after satisfying the requirements in the Inactive Hazardous Waste Disposal Site Law related to accessing the State Superfund.

Recently, the Honorable Thomas J. McAvoy, United States District Judge hearing the case between New York State and General Electric posed a similar question to which the State responded via a letter dated November 22, 2000 (see Attachment 4) from Assistant Attorney General Munro.

Comment NLPIA-3:

We have a concern regarding the focus on only PCBs and VOCs without an explanation as to why other priority pollutants are not considered. For example, Table 1 of the August 1999 Proposed Remedial Action Plan shows that measurable levels of semivolatile organic compounds (SVOCs) exist in the groundwater but these contaminants are not discussed in the text of the Plan. Also, the 1981 O'Brien and Gere report shows that measurable levels of Priority Pollutant metals exist in both groundwater and surface water samples tested. Why have these contaminants been dismissed as being pollutants of concern? An explanation must be provided as to why contaminants (including SVOCs and metals) other than PCBs and VOCs are not a concern.

Response NLPIA-3:

The text in the Record of Decision has been revised to address this comment which reads: "The Dewey Loeffel site is contaminated with several types of chemical compounds, including PCBs and volatile organic compounds (VOCs), which are typically industrial solvents and lubricants used during various manufacturing processes. Semi-volatile organic compounds and heavy metals were also found at the disposal site.

As described in the RI report, numerous soil and groundwater samples were collected at the site to characterize the nature and extent of contamination. VOCs and PCBs were selected as indicator parameters for the latest set of investigations; VOCs due to their mobility, and PCBs due to the potential concern for subsurface transport of PCBs away from the site, impacting the already contaminated surface water systems leading away from the site" See Section 4.1.1 page 10. (Indicator parameters - contaminants that are highlighted from among those present at a hazardous waste site, that because of factors such as concentration, volume, mobility, health or environmental risk and the fact that wastes are generally co-mingled, can be selected for the purpose of evaluating extent of contamination).

Comment NLPIA-4:

A comprehensive monitoring program must be developed to ensure that the extent of any future contamination (if it occurs) is detected as it occurs. Although the proposed remedy includes a monitoring component, we are concerned that it is not as extensive as it needs to be to protect the public from potential future problems. The monitoring program should include extensive testing of residential wells including those located away from the immediate vicinity of the landfill. Areas not affected by the pollutants should then be publicly identified to avoid needlessly alarming homeowners not impacted by the contamination. This has been a problem in the past because some residents near Nassau Lake believed that their well water was contaminated from pollution emanating from the Dewey Loeffel site as a result of ambiguous reporting by the media.

Response NLPIA-4:

It is too early to state what the operation and maintenance plan will be. Many of the variables of concern (gallons of leachate per day, concentration of contaminants, specific contaminants, appropriate treatment units, etc) will not be fully identified until completion of the entire design. During remedy construction the State's consultant will be tasked to develop the Operation and Maintenance Plan. It is obvious however, that given the problems occurring with private water supply wells already impacted or at risk; that these will be a special focus of the O&M Plan.

On the issue of ambiguous reporting, the public is always advised to contact DOH or DEC relative to the appropriateness of press comments. Mr. Sheehan or Mr. Ludlam are available for consultation.

Comments from local residents:

Local resident 1

Comment LR1-1:

I would certainly think that in the long run the proposed remediation will be more costly, then if they were to incinerate the dump right on the site to rid us of the problems once and for all.

Response LR1-1:

Please refer to response TN-1.

Comment LR1-2:

Will the public be regularly receiving results of the monitoring and the progress of, if any, the project and if indeed it is truly helping the situation?

Response LR1-2:

Monitoring results will be made available to the public. Routinely this data will be forwarded to the repository, the Town of Nassau Library.

Local Resident 2

Comment LR2-1:

Is the leachate collection system and water treatment plant 100 percent effective on a site that is sitting on fractured bedrock? Can the DEC be sure that there will be no leakage of toxins that may escape underneath the site? Removal of what is left of 40 tons of toxins is far safer than leaving them. Leaving the toxins there just leaves the door open for future problems, and no person wants to agree on a flawed, 1980 type of solution again.

Response LR2-1:

The remedial program selected for this site contains sufficient redundancies to address potential releases from the site. The permeability of the subsurface materials beneath the site cannot allow leachate to flow out of the site if the hydraulic gradient is inward; the issue becomes one of ensuring that the inward hydraulic gradient can be maintained over time. This issue will be resolved by proper design and operation of the remedial systems at the site.

As a point of clarification, the Department's current estimate is that the landfill contains approximately 43,000 tons of wastes as opposed to the 40 ton figure presented within Comment LR2-1.

Comment LR2-2:

Another concern we have is that if this proposal is implemented, can we count on yearly maintenance, monitoring, leachate collection, and water treatment to be properly done? Over time will this become neglected?

Response LR2-2:

It is the intent of the Department that sufficient resources will be allocated to the remedial program for this site for as long as necessary.

Comment LR2-3:

The best solution is to remove the contaminated soils and containers, and have them incinerated.

Response LR2-3:

Please refer to response TN-1.

Comment LR2-4:

A source-down approach to cleaning up the rest of the contaminants in the watershed should be implemented.

Response LR2-4:

The disposal site is no longer acting as a source of contaminants to the watershed, and has not since the mid-1980's. However, the approach proposed by the commenter is appropriate, and will likely be applied to the remedial program for the watershed PCB contamination.

Comment LR2-5:

One solution could be to remove the existing contaminants and place them into containers and seal the bedrock surface from future leakage. Then store the containerized contaminants at the same site and re-encapsulate them. Another similar approach is to re-encapsulate just the contaminated soil itself and seal the bottom of the site. These approaches are more costly but would leave the environment much safer for the future. Leachate collection and monitoring should be in place as a safeguard, with these solutions.

Response LR2-5:

Please refer to response TN-1 which relates to three treatment/offsite disposal scenarios developed based on comment at the public meeting. The approaches described in this comment would be considered to be more difficult and more costly than alternatives 10A, 10B and 11 and in the long term would be less protective.

Comment LR2-6:

A local resident described an area problem of depressed property values around Nassau Lake and questioned whose liability it was to compensate resident's losses.

Response LR2-6:

The selected remedy for the Loeffel containment cell should enable the Department to reclassify the site back to a classification of four (site remediated.) This reclassification should provide an enhancement of property values. If, after the remedial action is implemented, property values remain depressed, any property owner who has sustained loss because of the presence of the site

may be entitled to seek compensation from the parties which are responsible for the contamination at the site.

Comment LR2-7:

A local resident questioned chronic effects of low levels of contaminants from consumption of fish and wildlife in the area of the Dewey Loeffel site.

Response LR2-7:

Consumption of contaminated fish and wildlife is one way in which people can get PCBs into their bodies. The NYS DOH first evaluated this in the late 1970s, which lead to the advisory regarding eating fish from Nassau Lake and the Valatie Kill. PCBs can build up in your body over time and it may take months or years of regularly eating contaminated fish to build up amounts that are a health concern. Health problems that may result from PCBs range from small changes in health that are hard to detect to more serious health effects. Mothers who eat large amounts of fish with high PCB levels before becoming pregnant may have children who are slower to develop and learn. Women beyond their childbearing years and men face fewer health risks from consuming fish contaminated with PCBs than children do. PCBs cause cancer in animals. We cannot predict with certainty an individuals risk of developing cancer from eating fish contaminated with PCBs. Cancer currently affects about one in every three people, primarily due to smoking, diet and hereditary risk factors. Continuing to follow the NYS DOH fish advisories for Nassau Lake (all species, EAT NONE) will minimize your exposure and whatever cancer risk is associated with eating these fish.

The terrestrial wildlife that was mentioned in the question (turkey, rabbits, venison) are all terrestrial upland feeders, and are generally not affected by contaminated stream sediment. In 1980 some terrestrial animals from the Valatie Kill area were analyzed for PCBs and did not show elevated levels. We have not identified any significant route of exposure to contaminants from the Loeffel site other than consumption of contaminated fish and an isolated area of groundwater contamination south of the site. There are low concentrations of PCBs in the sediment in Nassau Lake and the Valatie Kill. A reassessment was recently done by NYS DOH regarding recreational use of these water bodies. The outcome of that assessment did not indicate a need to restrict use of the lake and the stream except for fish consumption. This is more fully described in the response to comment #28 and supported by Attachment 2.

Comments from the Rensselaer County Environmental Management Council (RCEMC):

Comment RCEMC-1:

A tenth alternative which discusses the feasibility of removing the wastes from the Dewey Loeffel Landfill should be included.

Response RCEMC-1: - -

Please refer to response TN-1.

Comment RCEMC-2:

Investigation into intercepting groundwater before it reaches the landfill should be performed and discussed.

Response RCEMC-2:

The Department believes that intercepting the bedrock groundwater to the east of the site (where water levels in the bedrock are higher than inside the disposal site, resulting in flow into the disposal site) is not appropriate for the following reasons:

- (1) The pumping of bedrock groundwater immediately adjacent to, and outside of, the disposal site would result in the need to increase drawdown in water levels within the disposal site, to continue to maintain an inward hydraulic gradient;
- (2) Additional drawdown of water levels in the eastern portion of the disposal site could cause mobilization of contaminants from the portion of the site which contains the highest concentration of wastes. (See the response to comments GE-3 and GE-4, above.)

Comment RCEMC-3:

The Department should include a discussion of the provisions for long-term monitoring/maintenance/remediation measures, and require that this long-term commitment be put in place in any final PRAP.

Response RCEMC-3:

Although the final Operation and Maintenance Plan will not be developed until the Remedial Design is performed, the elements of the Plan can be found on p. 34-5 of the Record of Decision text.

Comment RCEMC-4:

The Department should expand on its discussion of the analysis that will be done on the groundwater both before and after treatment and discuss the treatment methods that will be used to remove all contaminants that may result in a contravention of drinking water standards.

Response RCEMC-4:

During the design phase, all aspects of the remedy, including treatment of leachate and recovered groundwater will be addressed. Samples of both sources will be obtained and analyzed for the full range of contaminants. Once contaminants and their respective concentrations are identified, lab scale/pilot testing will be conducted to determine the most appropriate treatment methods to address the various problems. These results will be applied to the design of the full scale layout for the treatment plant.

Comment RCEMC-5:

A renewed attempt at posting the site should be an integral part of the maintenance of the disposal site as outlined in the draft PRAP.

Response RCEMC-5:

The Operation and Maintenance plan for the site will include reposting of the site, and periodic inspection and replacement as appropriate.

Comment RCEMC-6:

The existing and potential zone of influence of contamination from the Dewey Loeffel landfill should be characterized and made public.

Response RCEMC-6:

This information is available in the RI/FS reports at the document repositories. Two figures depicting the potential zone of influence have been added. See Attachment 3.

Comment RCEMC-7:

Remedial work on this project should commence as soon as possible. No further delays should occur while the department or the State negotiates the terms or conditions of reimbursement or financial responsibility.

Response RCEMC-7:

The Department will go forward with the remedial program for this site after satisfying the requirements in the Inactive Hazardous Waste Disposal Site Law related to accessing the State Superfund. Please refer to the response for NLPIA-2.

Comment RCEMC-8:

In order to assess whether downgradient residential wells are being negatively affected by dewatering from the proposed remediation, it is necessary to characterize the existing conditions in each of these potentially-affected wells. Residential well characterization and study should be an integral component of the final PRAP.

Response RCEMC-8:

The Department will evaluate the impact of operation of the remedial systems on the entire aquifer and the nearby private wells, and design the remedial systems to avoid dewatering the private wells. The remedial design effort will very likely use pump tests to determine the aquifer properties in the vicinity of the proposed recovery well locations, and in the vicinity of the private wells.

Comment RCEMC-9:

The RCEMC requests that a Well Arbitration Agreement or provisions be made part of the final PRAP, and directs your attention to the Matter of Daley, Lane and Empire Bricks for examples of this type of provision.

Response RCEMC-9:

The references in this comment pertain to mining permit conditions that were either considered or added to private mining permit applications put before the State. They would in effect protect private well supplies from adverse affects due to mining activities (blasting); requiring mine operators to replace affected systems.

Such an administrative action is unnecessary in the case of the Loeffel site, as the State is in charge of the landfill project. If adverse conditions arise in the future, the State is responsible in the first instance to take care of any problems. The State might seek out the responsible party to finance any needs (as with the current carbon treatment systems) or fund itself and seek cost recovery at a later date.

Public Meeting questions and answers:

- 1) Why was the remedial alternative of complete removal not evaluated?

Complete removal was not evaluated due to the very high costs and the potential for releases of contaminants associated with such a proposal. However, the Department will review this issue before completing remedy selection. Please refer to response TN-1.

- 2) How do you know there aren't more cracks in the bedrock beneath the site?

The exact number of fractures beneath the site is not as important as our now realizing that there is a zone of high permeability beneath the site. There is sufficient permeability in the bedrock to allow for migration of contaminants if the site containment is not upgraded. Once the upgrade as provided for in the selected remedy is completed, the resultant inward gradient would cause groundwater to flow from the bedrock into the site, and inhibit migration of contaminants out of the site.

- 3) Whose wells are contaminated? Do they show health effects?

The location of the impacted private wells was shown on the map at the meeting. The health of the residents is a private matter; the State does not reveal this information to respect the privacy of the residents.

- 4) Are the wells near Nassau Lake contaminated?

The private wells in the vicinity of Nassau Lake are not impacted by the groundwater contaminant plume from the disposal site.

- 5) Which wells are sampled, and how often?

There are currently 26 private wells around the Loeffel site that are being monitored. Four of these are fitted with carbon filter systems that are monitored on a quarterly basis; eight others adjacent to the plume are monitored semi-annually and another fourteen are in fringe locations which are monitored annually.

Data from these events are listed in the annual residential monitoring report found at the public document repositories.

- 6) Are there more contaminants within the landfill than are shown on the table in the PRAP?

Yes. The table in the PRAP was intended to show the contaminants within the groundwater contaminant plume. Other contaminants will also be controlled by the remedial systems.

- 7) Will the pumping of groundwater cause the nearby private wells to go dry?

The groundwater recovery and treatment system will be designed and operated in a manner which will not adversely impact the quantity of groundwater available for the private wells.

- 8) How deep in the rock is the contamination; could it be passing over my well?

(A description of the extent of the plume was given, using maps and cross-sections available at the meeting.)

- 9) How expensive would it be to do a complete removal?

Please see response to TN-1.

- 10) Why doesn't the State divert the clean groundwater before it enters the site?

The Department will evaluate the utility of intercepting this water before it enters the site. Please see response to RCEMC-2.

- 11) Is there money left in the State Superfund to do the cleanup?

The Department believes that there will be money available to perform the proposed remedial action. (The answer given at the November 1999 public meeting was correct at that time. However, given progress in the State Superfund Program, monies have continued to be obligated as projects are approved. Currently, we anticipate that there are sufficient funds for the design of the selected remedy. Funding for the actual construction, if not undertaken by a responsible party, will be contingent upon reauthorization of the State Superfund Program).

- 12) Why is the issue of "who will pay for the cleanup" not addressed in the PRAP?

The issue of "who will pay" is not relevant to the selection of remedy in the remedial program. (The remedy selection criteria were discussed.)

- 13) How long until the remedy is constructed?

It is estimated that remedial design could take a year or so. Implementation of the remedy would likely begin in 2001 or 2002.

- 14) How long will the pumping go on for?

The leachate collection and treatment would be required for the foreseeable future. The duration of groundwater recovery and treatment south of the disposal site is very difficult to predict; it could be for several years.

- 15) Would the State sample the spring on County Route 15?

The roadside spring in question was sampled in the past and no site related contaminants were detected. The NYSDOH does not recommend road side springs for sources of public drinking water unless they are maintained by the controlling municipality and routinely sampled for bacterial quality.

- 16) What contractor does the monitoring at the site?

The State's contractor does a portion of the monitoring, and GE's contractor does the rest.

- 17) How much leachate is pumped out of the site currently?

The leachate collection system is currently pumped "to yield" (until all leachate is pumped from the system and the storage tank is dry); several hundred thousand gallons have been pumped in each of the past few years.

- 18) What will happen at the site before the remedy is in place?

The current leachate collection system will continue to be pumped to yield, and the ongoing operation and maintenance will be continued. Some investigation work will be done to gather information for completion of the remedial design.

- 19) Where is the collected leachate brought currently?

The leachate is transported to properly permitted commercial disposal facilities.

- 20) Did GE pay people to not speak out at the public meeting?

The State has no knowledge of such agreements.

- 21) What is the frequency of the residential monitoring?

Please refer to response #5 above.

- 22) Why did DOH do the health survey?

DOH did not do a health survey near the Dewey Loeffel Landfill. In areas where there

was some known exposure (i.e. contaminated wells), medical consultation was provided to concerned individuals. As always, the DOH medical staff are available to answer questions or discuss concerns on an individual basis. Such consultation may be arranged through John Sheehan, the DOH project manager for the Dewey Loeffel Site at 518-402-7890.

Health studies are done by statistically comparing disease rates of an exposed population to that of the general population. In order for the results to be related to a particular source of contamination, there would need to be significant widespread exposure to site contaminants. This is not the case at the Loeffel site. For this reason, DOH did not feel that a survey was warranted. It is our understanding that an effort is being made by the Town of Nassau to collect data on medical symptoms of people living in the vicinity of the site. Plans for this effort were first brought to the attention of the State's representative at a meeting of the Nassau Toxic Waste Committee in November 1997. Although DOH did not initiate this effort, the DOH did offer to provide some guidance in collecting and interpreting data.

[Subsequent to the public meeting, the Town of Nassau requested assistance from the DOH with analyses of data on medical symptoms of people living in the vicinity of the site. DOH has agreed to assist the Town with this.]

23) Why would the proposed remedy work better than the last remedy?

The science and technology related to containment of contaminated sites and the Department's knowledge and expertise of how to operate and maintain encapsulated sites has advanced considerably since 1980. The issue of hydraulic management of encapsulated sites is now well documented and understood. Once an inward hydraulic gradient is established, leachate migration out of the disposal site will no longer occur.

24) How much contaminated soil is there south of the site?

Contaminated soils have not been identified south of the site. Contaminated soil /sediment is found in the Valatie Kill drainage ways and is the subject of a separate study including Nassau Lake.

25) How much pumping out has been done at the site?

The existing leachate collection system is pumped to yield; several hundred thousand gallons of leachate have been collected in recent years.

Several questions were also asked by the public on issues not related to the PRAP for the disposal site. The discussions focused upon potential health impacts related to possible exposures to PCB in the vicinity of Nassau Lake: (See Attachment 2). A summary of the questions is listed below for the public's information and use.

26) What air monitoring has been done for PCBs in the vicinity of Nassau Lake?

Air monitoring was done along the shoreline of Nassau Lake in early September of 1997 in response to concerns that PCBs will readily volatilize from drying sediment. Sampling was done by a G.E. consultant in accordance with an approved work plan which was reviewed by NYSDEC, NYSDOH, the Nassau Lake Assoc., the Rensselaer Co. EMC and the Citizens Environmental Coalition. This work was done during summer months when the warm weather would promote volatility. The results of the sampling showed no detection of PCBs at a detection limit of 4 nanograms/cubic meters which is roughly equivalent to 4 parts per trillion. This is consistent with our experience near other PCB contaminated waterways in that we have not seen significant elevation of air levels of PCBs above background. This suggests that although volatilization from drying sediment is one way in which PCBs can get into air it does not happen at a rate that measurably increases the ambient air level in that area.

27) Members of the public are concerned that when the lake water levels are drawn down in the winter that the contaminated sediments dry out and are transported by wind, causing possible human exposures to PCB.

The winter drawdown of Nassau Lake is done to protect private properties from ice damage. Depending on rainfall, the water level is drawn down by later November to mid December to the point where some lake bottom is exposed. Due to the low angle of the sun, the short daylight hours and the winter weather conditions at that time of the year, the sediment remains wet and ultimately becomes frozen and snow covered. These conditions do not allow the sediment to become wind blown. To further evaluate this, DOH staff visited the lake numerous times during December 1999 (at least twice per week). During that time, the lake bottom remained wet and did not become subject to air transport.

Comment 28: Is exposure to Nassau Lake sediment through recreational use of the Lake a hazard?

Answer:

Recently, the New York State Department of Health has undertaken a reevaluation of the question of recreational use of Nassau Lake. This evaluation considered some recent studies done in areas where potential exposure is similar to that of people who may be exposed to PCBs at Nassau Lake. People may take in PCBs if they are exposed to low levels in sediment or soil. However, we do not believe that the possible exposures or any associated health risks at Nassau Lake are at levels to warrant a recommendation that people should be prevented from recreational contact with the lake sediment or shoreline soil (see Attachment #2 for basis). Much larger exposures to PCBs are possible if people eat fish from the Lake. Thus, we continue to recommend that no one eat any fish from the Lake.

One method of evaluating exposures and health risks is to use information about PCB levels in the sediment, soil, water, and air around Nassau Lake and information about how people may be exposed to these media. This method suggests that PCB exposures (except for eating

fish) at Nassau Lake are likely to be small and unlikely to cause detectable health effects. Supporting documentation for this can be found in the attachment.

Another way of evaluating possible exposures, and by inference health risks, from PCBs at Nassau Lake is to review studies of people who could have been exposed to PCBs in situations similar to those at Nassau Lake. Studies that measured both PCB levels in people's blood serum and PCB levels in sediment or soil are particularly useful. People in these studies were compared with people not similarly exposed to see if PCBs from the sediment or soil got into their bodies. These studies (see Attachment 2, particularly Tables 1 and 2) did not consistently detect elevated serum PCB levels. The PCB levels in soil and sediment in these studies were generally higher than levels near Nassau Lake. Thus, these findings suggest that it may be difficult to detect an increase in PCB serum levels due to exposure to PCBs from Nassau Lake sediment and soil.

Both methods of evaluation suggest that exposure to PCBs in soil or sediment at Nassau Lake is likely to be small and people are unlikely to experience any detectable health effects that can be associated with the exposures. However, we can not rule out that people may have some, although difficult to detect, increase in PCB body burdens. For some time, we have been evaluating possible exposures to PCBs from the sediment and soil around Nassau Lake. Our current analysis incorporates much of the new information gathered since we began our evaluation, and we will continue to update our analysis as new information becomes available. Consistent with past statements, our evaluations and the environmental data do not warrant a recommendation that people be prevented from using the Lake for recreational purposes. However, if people continue to feel uncomfortable with the conditions at Nassau Lake and want to minimize their potential exposure to PCBs in sediment, we have suggestions for them to consider. Examples of some possible steps to take are rinsing off mud after contact with sediment or soil that may have low levels of PCBs or rinsing off children's toys that may have sediment or soil on them. We continue to remind everyone that no one should eat any fish from the Lake. A more detailed document is attached. (See Attachment 2)

Attachment 1

A Preliminary Evaluation of the Complete Removal, Treatment and Disposal of the Loeffel Disposal Site

In order to address comments from the public on the remedy selection for this site, NYSDEC has performed a preliminary evaluation of the complete removal, treatment, and disposal of wastes which were disposed at the site.

This evaluation includes the following:

- A description of the work elements which would need to be performed;
- Estimates of the unit costs for the work elements, along with the estimated amount of work to be done for each work element;
- Comparison of the overall effectiveness of the complete removal of the disposal site.

Work Elements

The removal, treatment, and disposal of the entire disposal site would consist of:

- mobilization
- treatability pilot test;
- a large excavation within the disposal site;
- water management during construction;
- shoring to allow for the excavation;
- materials handling (loading and trucking);
- confirmatory sampling;
- operation of a treatment process to render the disposal site contents non-hazardous;
- placement of the treated soils back in the former disposal site location;
- seeding and mulching of the disposal site.

The capital costs of the downgradient bedrock pump and treat system would also be added to address the plume of contaminants in the vicinity of the homeowner wells to the south.

Additional capital costs to implement the project include:

- construction oversight;
- engineering design;
- contingency.

Long term costs would also be incurred to perform long-term monitoring of the groundwater in the vicinity of the site to confirm the effectiveness of the remedial action, and to operate and maintain the water treatment system.

Responsiveness Summary

Dewey Loeffel Site

Operable Unit 2

Attachment 1

Additional Cost Evaluations

Attachment 1

A Preliminary Evaluation of the Complete Removal, Treatment and Disposal of the Loeffel Disposal Site

In order to address comments from the public on the remedy selection for this site, NYSDEC has performed a preliminary evaluation of the complete removal, treatment, and disposal of wastes which were disposed at the site.

This evaluation includes the following:

- A description of the work elements which would need to be performed;
- Estimates of the unit costs for the work elements, along with the estimated amount of work to be done for each work element;
- Comparison of the overall effectiveness of the complete removal of the disposal site.

Work Elements

The removal, treatment, and disposal of the entire disposal site would consist of:

- mobilization
- treatability pilot test;
- a large excavation within the disposal site;
- water management during construction;
- shoring to allow for the excavation;
- materials handling (loading and trucking);
- confirmatory sampling;
- operation of a treatment process to render the disposal site contents non-hazardous;
- placement of the treated soils back in the former disposal site location;
- seeding and mulching of the disposal site.

The capital costs of the downgradient bedrock pump and treat system would also be added to address the plume of contaminants in the vicinity of the homeowner wells to the south.

Additional capital costs to implement the project include:

- construction oversight;
- engineering design;
- contingency.

Long term costs would also be incurred to perform long-term monitoring of the groundwater in the vicinity of the site to confirm the effectiveness of the remedial action, and to operate and maintain the water treatment system.

Dewey Loeffel Disposal Site - Operable Unit 2
Capital Cost Calculation - Alternative 10A Off- Site Disposal (Incinerate)

Work Element	Unit Cost	Amount	Capital Cost
Mobilization	\$250,000	LS	\$ 250,000
Sheet Pile at Wall	\$25/VSF	140,000 VSF	\$ 3,500,000
Install Dewater System	\$250,000	LS	\$ 250,000
Excavate Topsoil ^A	\$4.25/cy	106,500cy	\$ 453,000
Transport Top Soil On-site ^A	\$4.35/cy	106,500cy	\$ 463,000
Concrete Pad ^B	\$200/cy	30cy	\$ 6,000
Excavate Contaminated Soil ^C	2x \$4.25/cy	266,200cy	\$ 2,263,000
Transport Soil On-site	2 x \$4.35/cy	266,200cy	\$ 2,316,000
Disposal Cost ^D	\$1,200/T	466,000T	\$559,000,000
Confirmatory Sampling ^E	\$810/sample	466 samples	\$ 378,000
Cleanfill ^F	\$5.25/T	466,000T	\$ 2,447,000
Compact Soil	\$0.60/cy	266,200cy	\$ 160,000
Replace Topsoil	\$4.25/cy	106,500cy	\$ 453,000
Revegetate ^G	\$0.35/sy	82,300sy	\$ 29,000
Capital Cost Sub-total			\$570,868,000
Project Management and Engineering Design		10%	\$ 57,087,000
Contingency		25%	\$ 142,717,000
Capital Cost Total			\$ 770,672,000

- A. Use 6 vertical feet and 11 acres
- B. Stage area slab 40 x 60 feet
- C. Use 15 vertical feet, 11 acres and Level B multiplier of 2x
- D. Use all soil no landban, incinerate in Texas (costs include transportation)
- E. One sample per 100 ton
- F. Clean fill-bank run, 1.5 T/cy
- G. Use 17 acres

Dewey Loeffel Disposal Site - Operable Unit 2
Capital Cost Calculation - Alternative 10B Off Site Disposal(Incinerate/Landfill)

Work Element	Unit Cost	Amount	Capital Cost
Mobilization	\$250,000	LS	\$ 250,000
Sheet Pile at Wall	\$25/VSF	140,000 VSF	\$ 3,500,000
Install Dewater System	\$250,000	LS	\$ 250,000
Excavate Topsoil ^A	\$4.25/cy	106,500cy	\$ 453,000
Transport Top Soil On-site ^A	\$4.35/cy	106,500cy	\$ 463,000
Concrete Pad ^B	\$200/cy	30cy	\$ 6,000
Excavate Contaminated Soil ^C	2x \$4.25/cy	266,200cy	\$ 2,263,000
Transport Soil On-site	2 x \$4.35/cy	266,200cy	\$ 2,316,000
Disposal Cost ^D			
Incinerate	\$1200/T	116,500T	\$139,800,000
Landfill	\$ 134/T	349,500T	46,833,000
Confirmatory Sampling ^E	\$810/sample	466 samples	\$ 378,000
Cleanfill ^F	\$5.25/T	466,000T	\$ 2,447,000
Compact Soil	\$0.60/cy	266,200cy	\$ 160,000
Replace Topsoil	\$4.25/cy	106,500cy	\$ 453,000
Revegetate ^G	\$0.35/sy	82,300sy	\$ 29,000
Capital Cost Sub-total			\$199,601,000
Project Management and Engineering Design		10%	\$ 19,600,000
Contingency		25%	\$ 49,900,000
Capital Cost Total			\$ 269,101,000

- A. Use 6 vertical feet and 11 acres
- B. Stage area slab 40 x 60 feet
- C. Use 15 vertical feet, 11 acres and Level B multiplier of 2x
- D. Assume 25% is landban soil, requires incineration in Texas, 75% is to be landfilled in Model City, NY (costs include transportation)
- E. One sample per 100 ton
- F. Clean fill-bank run, 1.5 T/cy
- G. Use 17 acres

Dewey Loeffel Disposal Site - Operable Unit 7
Capital Cost Calculation - Alternative 11 - Ex Situ, On-Site Thermal Desorption

Work Element	Unit Cost	Amount	Capital Cost
Mobilization	\$250,000	LS	\$ 250,000
Sheet Pile at Wall	\$25/VSF	140,000 VSF	\$ 3,500,000
Install Dewater System	\$250,000	LS	\$ 250,000
Excavate Topsoil ^A	\$4.25/cy	106,500cy	\$ 453,000
Transport Top Soil On-site ^A	\$4.35/cy	106,500cy	\$ 463,000
Concrete Pad ^B	\$200/cy	30cy	\$ 6,000
Excavate Contaminated Soil ^C	2x \$4.25/cy	266,200cy	\$ 2,263,000
Transport Soil On-site	2 x \$4.35/cy	266,200cy	\$ 2,316,000
Thermo Desorption ^D	\$160/T	466,000T	\$74,560,000
Confirmatory Sampling ^E	\$810/sample	466 samples	\$ 378,000
Replace Cleaned Soil	\$4.25/yd	266,200 cy	\$ 1,131,000
Compact Fill & Add Water	\$0.90/cy	266,200cy	\$ 240,000
Replace Topsoil	\$4.25/cy	106,500cy	\$ 453,000
Revegetate ^G	\$0.35/sy	82,300sy	\$ 29,000
Capital Cost Sub-total			\$ 86,292,000
Project Management and Engineering Design		10%	\$ 8,629,000
Contingency		25%	\$ 21,573,000
Capital Cost Total			\$116,494,000

- A. Use 6 vertical feet and 11 acres
- B. Stage area slab 40 x 60 feet
- C. Use 15 vertical feet, 11 acres and Level B multiplier of 2x
- D. Desorption costs vary \$35-300/ton
- E. One sample per 100 ton
- F. Clean fill-bank run, 1.5 T/cy
- G. Use 17 acres

Responsiveness Summary

Dewey Loeffel Site

Operable Unit 2

Attachment 2

Nassau Lake Sediment Exposures

NASSAU LAKE EXPOSURE ASSESSMENT AND HEALTH RISK INFORMATION

This exposure assessment identifies completed exposure pathways associated with Nassau Lake. An exposure pathway is the process by which an individual may be exposed to contaminants originating from a site. An exposure pathway has five elements: (1) a contaminant source; (2) environmental media and transport mechanisms; (3) a point of exposure; (4) a route of exposure; and (5) a receptor population. Environmental media and transport mechanisms "carry" contaminants from the source to points where people are or may be exposed. The route of exposure is the manner in which a contaminant actually enters or contacts the body (e.g., ingestion, inhalation, dermal absorption). The receptor population is the person or people who are, or may be, exposed.

1. Estimating Possible PCB Exposures at Nassau Lake

Exposure Routes

People could be exposed to PCBs around Nassau Lake in several ways. People could eat PCB-contaminated fish. People, especially children, might incidentally ingest sediment or soil containing PCBs through hand-to-mouth contact. PCBs could be absorbed through skin that is in contact with PCB-containing sediment or soil while wading or playing. PCBs from the sediment or soil could possibly evaporate into the air and people could breathe them in as a vapor. If the sediment or soil becomes airborne, people could possibly breathe in small particles containing PCBs. If PCBs were in the water, people could take in some PCBs by swallowing some lake water during playing or swimming or absorbing some PCBs through the skin. Although all of these exposures could occur in theory, some are more likely than others.

Exposures from Sediment and Soil

Samples of the sediment and soil at Nassau Lake have been analyzed for PCBs. The levels of PCBs in sediment range from less than 0.08 parts per million (ppm) to 9 ppm. The average PCB level in these samples of the lake's sediment is 2.3 ppm. The average for the sediment in the northern end of the lake is higher (3.1 ppm) than for the southern end (1.6 ppm). Soil samples were taken from five properties, at flood-prone areas at the edge of the lake, and the PCB levels ranged from less than 0.018 ppm to 2.2 ppm. The highest average in any one property was 1.4 ppm. For the other properties, PCB levels averaged 0.23 ppm, 0.05 ppm, 0.04 ppm and non-detect. The PCB levels in the sediment are fairly consistent throughout the lake and the soil levels are, for the most part, lower. We've used the average sediment level of 3 ppm to evaluate exposures and risks. Using this value is likely to overestimate, rather than underestimate, exposures and risks.

People can be exposed to PCBs in contaminated sediment or soil by incidentally eating some soil or sediment or by absorbing PCBs through the skin. We estimated the average daily amount of PCBs that a six-year-old child would take into the body if he or she were exposed to sediment or soil containing 3 ppm of PCBs. Using procedures outlined by the U. S. Environmental

Protection Agency (EPA) and the exposure assumptions shown in Table 3, the amounts would be about 0.008 micrograms of PCBs per kilogram of body weight (mcg/kg) through incidental ingestion and 0.003 mcg/kg through the skin. We also evaluated the health risks associated with these amounts. These intakes are about 500 times less than those that have caused health effects in animals (see figure).

One factor that is important in this evaluation is that the amount of soil-bound PCBs absorbed through the skin and into the body is relatively low, particularly compared to absorption after ingestion. Studies in animals and humans consistently show that about 90% or more of ingested PCBs (not bound to soil) are absorbed into the body (ATSDR, 1998). A study with rats suggests that the percent absorption of soil-bound PCBs when ingested is 70 - 90% (Fries et al., 1989). In contrast, an estimate of the percent absorption of soil-bound PCBs (as Aroclor 1242 or Aroclor 1254) applied to monkey skin is about 14% (Wester et al., 1993).

Exposures from Air

People could breathe in PCBs that evaporate into the air or that are on small airborne sediment or soil particles. General Electric (GE) measured air for PCBs at Nassau Lake at three locations on the shore during the summer of 1997. By taking the samples in the summer, GE increased the likelihood of finding PCBs in the air. No PCBs were detected in the air (detection limit of 0.004 micrograms per cubic meter of air). These results are not surprising because PCBs, especially the Aroclor 1260 at Nassau Lake, do not readily evaporate. Also, we would not expect people to breathe in many small soil particles because the sediment/soil is likely to be damp and small particles are not likely to be produced. Given these data and conditions at Nassau Lake, inhalation exposure is unlikely to be important.

Exposures from Water

With one exception, PCBs have not been detected in the water at Nassau Lake. The detection limit for PCBs was 0.022 micrograms per liter (mcg/L). One sample of lake water taken on November 18, 1993, during heavy runoff contained 0.053 mcg/L. This is below the drinking water standard of 0.5 mcg/L. Given these data, we believe that exposure to PCBs while swimming in the water is unlikely to be important.

Uncertainties

This assessment evaluates data to determine the potential for PCBs to cause health effects in people living at Nassau Lake. Uncertainties are inherent in any exposure or risk assessment. In this assessment, uncertainties are associated with the data on PCB levels in sediment, soil, air and water; some of the assumptions used to estimate exposure; the toxicological data on PCBs; and the human exposure studies. In preparing this assessment, we used what we consider to be the best available scientific data and likely overestimated, rather than underestimated, exposures.

2. PCB Levels in People Living Near PCB-Contaminated Sediment or Soil

Many studies have measured PCB levels in the blood serum of people potentially exposed to PCBs. Some studies were of people who were exposed because of specific activities, such as their occupation. Other studies looked at people living near contaminated areas. The studies show that certain types of activities increase PCB levels in serum above serum PCB levels in the general population. These activities include working with PCBs, eating contaminated food (e.g., fish), playing with contaminated electrical parts, living on a farm with contaminated silos, or living with someone who was exposed at work (ATSDR, 1998). A few studies examined PCB levels in serum of people who lived near sites with sediment or soil containing PCBs (see Tables 1 and 2). The soil or sediment PCB levels at these sites are, for the most part, much higher than the PCB levels at Nassau Lake. At all sites, the PCB levels in the people's serum were not above levels in the general population, except for those people who engaged in the activities listed previously (e.g., eating PCB-contaminated fish). At one site (Housatonic River Area in Table 2), serum PCBs levels in people engaged in activities associated with soil/sediment exposure (yard work, gardening, canoeing) were similar to those of people who did not engage in such activities.

These studies have limitations and cannot be considered definitive. Only a small number of people were in the studies and only two studies included children (Yaffe and Reeder, 1989, and one study in Stehr-Green et al., 1988).

Table 1. Summary of Biomonitoring Data on Populations Living Near PCB-Contaminated Sites (Adapted from Stehr-Green et al., 1988).

Site	Maximum On-Site Soil (ppm)	Maximum Off-Site Soil (ppm)	Blood Serum PCB Levels in People with Highest Exposure Potential*		
			Number of People	Geometric mean (ppb)**	Percent Below 20 ppb**
<i>Sites with No Evidence of Increased Human Serum PCB Levels***</i>					
Sebastian, AR	no data	133,000	20	5.8	100
Wayne, GA	3,436	149	4	5.1	100
Norfolk, MA	220,000	3	89	4.1	100
Ashtabula, OH	no data	0.1	57	4.1	100
Allegheny PA	32,000	1,106	9	2.7	100
Chester, PA	36,000	6,400	22	5.3	95
Pickens, SC	no data	130	27	2.6	96
Marion, WV	22,226	205	24	5.0	96
Monroe, IN (3 sites)#	333,000	3,500	51	9.0#	90#
<i>Sites with Evidence of Increased Human Serum PCB Levels</i>					
New Bedford (Newport) MA##	99,000	no data	42	13##	79##

- * People with the greatest reported frequency and duration of activities that might lead to contact with contaminated areas; data for non-workers only except for Sebastian, Pickens, and Marion.
- ** At the time of the studies, most people without occupational exposure had serum PCB levels in the low ppb range with median levels between 5 - 7 ppb and 95% of the levels were below 20 ppb (5% were 20 ppb or above).
- *** Sites where ATSDR (Stehr-Green et al., 1988) did not find a statistically significant increased proportion of non-occupationally exposed people with serum PCB levels substantially above background levels (i.e., the proportion of people with serum PCB levels 20 ppb or above was not significantly different from the expected proportion of 5%).
- # ATSDR (Stehr-Green et al., 1986) could not trace elevated levels in people to any specific environmental (non-occupational) route of exposure (including contact with contaminated soil/sediments) with the possible exception of people who reportedly salvaged metal from discarded electrical equipment; 10% of the people had levels 20 ppb or above which is not significantly ($p = 0.12$) different from the proportion expected (5%); ATSDR recommended additional studies to find out sources of exposure.
- ## People who ate large amounts of locally-caught seafood had higher PCB levels than people who did not eat seafood. Thus, the primary source of environmental exposure was determined to be the consumption of contaminated seafood (Telles, 1982; see Table 2 for follow-up study); 21% of the people had levels 20 ppb or above which is significantly ($p < 0.05$) different from the expected proportion of 5%).

Explanation

١٠٠

- | | |
|--------------------------|-----------------|
| ☐ | > 10,000 |
| ☐ | 1,000 to 10,000 |
| ☐ | 100 to 1,000 |
| ☐ | 10 to 100 |
| ☐ | < 10 |

Deerparden Well

• 4444 2211

- Deep Bedrock Well

150 600

SCALE IN FEET

Benzene, Oct-Nov 1993

GE Loeffel



HSI
GEOTRANS

SEARCHED BY: [redacted]
SERIALIZED BY: [redacted]
FILED BY: [redacted]
FBI - [redacted]

POL-92

2-1

Responsiveness Summary

Dewey Loeffel Site

Operable Unit 2

Attachment 4

Letter to Judge McAvoy



STATE OF NEW YORK
OFFICE OF THE ATTORNEY GENERAL

ELIOT SPITZER
Attorney General

DIVISION OF PUBLIC ADVOCACY
ENVIRONMENTAL PROTECTION BUREAU

November 22, 2000

Hon. Thomas J. McAvoy
United States District Judge
Northern District of New York
Federal Building
15 Henry Street
Binghamton, NY 13901

Re: State of New York, et al. v. General Electric Company
89-CV-1135

Dear Judge McAvoy:

This letter responds to the questions posed by the Court in its November 8, 2000 Order. We first briefly discuss background events that have a bearing on how remedial efforts will proceed in this litigation.

Loeffel landfill operations

In the 1950s and 1960s, Dewey Loeffel and members of his family disposed of about 46,000 tons of chemical wastes at a site they owned in the Town of Nassau, Rensselaer County, now known as the "Loeffel landfill". Loeffel obtained the majority of the waste from General Electric ("GE")- approximately 37,530 tons of chlorinated solvents, waste oils, PCBs, acids and bases, and heavy metal sludges. Loeffel also accepted wastes from Schenectady Chemicals, Inc (now known as Schenectady International), Bendix Corporation and a number of other sources. Contaminants from the landfill entered the groundwater and surface water because of improper disposal. In the late 1970s, the State discovered the presence of PCBs and other contaminants in surface water runoff from the site as well as in sediments, fish and other aquatic life downstream in both the Valatie Kill and Nassau Lake.

The 1980 Agreement Between GE and DEC

In an agreement between GE and the New York State Department of Environmental Conservation ("DEC") signed on September 24, 1980, and covering seven hazardous waste sites

This Action

In 1989, relying on the above-referenced reservation of rights, the State filed suit against GE under the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. 9601, et seq., as amended (CERCLA, or the federal Superfund law), and State common law, based on the State's determination that PCBs and other wastes had migrated from the Loeffel Site prior to its encapsulation. In 1992, the parties entered into a stipulation approved by the court obligating GE to: (1) conduct an expansive investigation of the extent of contamination in the drainageways leading away from the Loeffel Landfill; and then (2) recommend a remedial program. With the state's approval, GE prepared and submitted separate Remedial Investigation and Feasibility Study reports for (a) groundwater adjacent to the landfill and (b) surface water, sediment and biota. GE has also proposed remedial activities for both (a) and (b). We have reported these activities in detail in our quarterly status reports to the Court.

With this background in mind, the State provides the following answers to the Court's questions.

1. Provide an estimate to the Court with a reasonable degree of certainty when a final ROD will be prepared with respect to the groundwater and, based upon such estimate, provide an estimate when the work under such plan would commence;

DEC has advised me that it will issue a Record of Decision for the landfill and groundwater by January 31, 2001.

When the work under the ROD will commence is dependent upon a number of factors, including whether the State or GE implements the remedial program (discussed below). Whichever party does the work, prior to actual construction a Remedial Design ("RD") must be prepared. The RD establishes the size, scope and character of the remediation planned for a site. The level of detail and form of the remedial design depends upon the mandates of the ROD, and the complexity of the remedial project to be implemented. In this case, the remedy will likely involve intrusive work into a hazardous waste landfill which requires careful consideration of construction means and methods as well as contingency plans. The RD includes preparation of a Design Report and the Plans and Specifications. The Design Report establishes all of the basic parameters (including supporting engineering evaluations and calculations) related to each physical component of the remedy such as the size of any treatment units, depth of collection system piping, etc. The Plans and Specifications are documents which describe and depict precisely what must be built. The Plans and Specifications enable DEC to solicit competitive bids for construction; bids are then solicited and a construction contract is awarded. The RD will also include project schedules and project costs, applicable community and worker health and safety plans, confirmation sampling plans, and site restoration plans. Given the complexity of the remedial program, it will likely be several years between the date of the ROD and the date that actual construction of the remedy commences.

Of course, representatives of the State are prepared to meet with the Court to answer any further questions.

Respectfully submitted,



David A. Munro
Assistant Attorney General
Bar Roll No. 102968
(518) 474-8481
david.munro@oag.state.ny.us

cc: Michael Elder, Esq.- GE
Judith Brindle, Esq. - Counsel, Nassau Lake Homeowners' Assn.
Robert Smith, Esq. - Rensselaer County Attorney
Philip L. Danaher, Esq.- Counsel, Town of Nassau
Kenneth Duffy - Rensselaer Co. Environmental Management Council
Tom Tobia- President, Nassau Lake Assn, Inc.
Eileen Natoli - Supervisor, Town of Schodack
Carol Sanford- Supervisor, Town of Nassau
William Knight, Supervisor- Nassau Toxic Waste Committee

Dewey Loeffel Landfill - Disposal Site
Operable Unit 02

Administrative Record Document List

Blasland, Bouck & Lee, Inc., 1992. Remedial Work Plan, Loeffel Site Environs. Prepared for the General Electric Company, Revised July 1992.

Blasland, Bouck & Lee, Inc., 1993. Loeffel Site Environs Remedial Investigation Interim Phase I Report, prepared for the General Electric Company, October 1993.

Blasland, Bouck & Lee, Inc., 1995 Loeffel Site Environs Remedial Investigation Phase I Report, prepared for the General Electric Company, April 1995.

Blasland, Bouck & Lee, Inc., 1997a. Loeffel Site Environs Feasibility Study Report: Surface Water, Sediment, and Biota, prepared for the General Electric Company.

Blasland, Bouck & Lee, Inc., 1997b. Loeffel Site Environs Remedial Investigation Phase II Report, prepared for the General Electric Company, May 1997.

Blasland, Bouck & Lee, Environmental Services Inc., Quarterly Report - Residential Well Treatment Systems Reports, prepared for General Electric Company

Camp Dresser & McKee, 1985. Dewey-Loeffel Hazardous Waste Site Final Engineering Report and Certification of Completion, prepared for NYSDEC, December 10, 1985.

GeoTrans, Inc., 1994. Interim Hydrogeologic Report, Remedial Investigation, Loeffel Site Environs, Volumes I and II, August 4, 1994.

GeoTrans, Inc., 1996a. Remedial Investigation, Loeffel Site Environs, Interim Hydrogeologic Report, Volumes I and II, prepared for the General Electric Company, August 4, 1994, revised October 1996.

GeoTrans, Inc., 1996b. Loeffel Site Environs Remedial Investigation, Phase I Final Hydrogeologic Report, Volumes I and II, prepared for the General Electric Company, March 1996, revised October 1996.

ESI Geo Trans, Inc., 1997. Loeffel Site Environs Remedial Investigation, Phase II Final Hydrogeologic Report, prepared for the General Electric Company, May 9, 1997.

ESI GeoTrans, Inc., Loeffel Environs Groundwater Semi-Annual Sampling Event Reports prepared for the General Electric Company.