Department of Environmental Conservation

Division of Hazardous Waste Remediation

Babylon Landfill
Operable Unit Number 2

Site Number 152039
Suffolk County, New York

Record of Decision

March 1994

Funded under Title 3
of the
1986 Environmental Quality Bond Issue

New York State Department of Environmental Conservation
MARIO M. CUOMO, *Governor* LANGDON MARSH, *Acting Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

Babylon Landfill Inactive Hazardous Waste Site
Operable Unit No. 2
Town of Babylon, Suffolk County, New York
Site No. 1-52-039

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedial action for Operable Unit No. 2 (O.U. 2) of the Babylon Landfill inactive hazardous waste disposal site which was chosen in accordance with the New York State Environmental Conservation Law (ECL). 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 upon the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for O.U. 2 of the Babylon Landfill Inactive Hazardous Waste Site and upon public input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A bibliography 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 threat to public health and the environment.

Description of Selected Remedy

Based upon the results of the Remedial Investigation/Feasibility Study (RI/FS) for the Babylon Landfill and the criteria identified for evaluation of alternatives the NYSDEC has selected groundwater capture and treatment at the source. The components of the remedy are as follows:

- 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. Uncertainties identified during the RI/FS will be resolved.

- Modification of the Babylon Resource Recovery Facility (RRF) supply well to enhance capture of contaminated groundwater at the landfill boundary.

- Initiation of a monitoring program for ground and surface water, and landfill gas emissions.

- An annual review by DEC of the effectiveness of the remedy, as indicated by the results of the monitoring program. Further remedial action will be evaluated and implemented if the remedy is not found to be protective of human health and the environment.

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 provides adequate, though not complete, protection of the environment. It complies to the extent feasible 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.

The selected remedy is stated not to provide complete protection of the environment, since it will not address landfill-related contamination in off-site surface waters for a number of years. However, alternatives to achieve this remedial objective more quickly were determined not to be feasible.

March 31, 1994
Date

Ann Hill DeBarbieri
Deputy Commissioner

TABLE OF CONTENTS

SECTION			PAGE
1:	Site Description		5
2:	Site History		5
	2.1	Operational/Disposal History	5
	2.2	Remedial History	5
3:	Current Status		6
	3.1	Summary of Remedial Investigation	6
	3.2	Summary of Human Exposure Pathways	8
	3.4	Summary of Environmental Exposure Pathways	8
4:	Enforcement Status		8
5:	Summary of Remediation Goals		9
6:	Summary of the Evaluation of Alternatives		9
	6.1	Description of Remedial Alternatives	9
	6.2	Evaluation of Remedial Alternatives	11
7:	Summary of the Selected Alternative		14
8:	Highlights of Community Participation		15

FOLLOWS PAGE

Figures	1.	Site Location Map	5
	2.	Site Plan	5
	3.	Landfill Plume Map	7
	4.	Adjacent Sites Plume Map (Volatile Organic Compounds)	7
Tables	1.	Summary of Landfill-Derived Contaminants in Groundwater	7
	2.	Summary of Surface Water Contaminants	8
	3.	Cost Comparison of Alternatives	14
Appendices	Appendix A:	Responsiveness Summary	15
	Appendix B:	Administrative Record	15

RECORD OF DECISION
BABYLON LANDFILL
OPERABLE UNIT NO. 2
Town of Babylon, Suffolk County, New York
Site No. 1-52-039

SECTION 1: SITE DESCRIPTION

The Babylon Landfill, listed on the New York State Registry of Inactive Hazardous Waste Sites as Site No. 1-52-039, is located off Edison Avenue in West Babylon, near the hamlet of Wyandanch, southwestern Suffolk County. The landfill occupies 65 acres of an 85-acre property which is also the site of the Town of Babylon's Resource Recovery Facility and ash landfills. Commercial properties and light industry, with a few private residences, are located to the east and west of the site in a commercial/ industrial zoned district, the Pinelawn Industrial Area. Figure 1 shows the site and its environs. To the north and south of the site are cemeteries; a quarter-mile farther to the south is a residential district. The nearest surface water body is the Santapogue Creek, 1.5 miles south of the site. Other inactive hazardous waste sites are located near the Babylon Landfill: Spectrum Finishing (Site No. 1-52-029), Pride Solvents (Site No. 1-52-025) and U.S. Electroplating Corporation (1-52-027), all located within the Pinelawn Industrial Area; and Cantor Brothers, Inc. (Site No. 1-52-021) to the northwest.

Operable Unit No. 2 (O.U. 2) is the subject of this ROD. Operable Unit No. 2 consists of the remediation of impacts to off-site groundwater, surface water and stream sediments from the Babylon Landfill. An Operable Unit represents a discrete action that comprises an incremental step toward comprehensively addressing site problems by eliminating or mitigating a release, threat of release, or pathway of exposure. Operable Unit No. 1 for this site is described in Section 3.2.

SECTION 2: SITE HISTORY

2.1: Operational/Disposal History

The Babylon Landfill operated from 1947 to 1991, accepting residential, commercial, industrial and construction/demolition wastes. In addition to landfilling, the Town of Babylon also accepted and processed scavenger cesspool waste from 1955 to 1978 and operated incinerators for municipal waste from 1955 to 1978. Presently the site is occupied by the Resource Recovery Facility (RRF), operated by Ogden-Martin Systems under contract to the Town, for waste-to-energy conversion. Ashfill cells are piggybacked onto the south side of the inactive landfill. A landfill cell for waste bypassing the RRF has been constructed over the "Northern U" section of the landfill. See Figure 2 for a plan of the site.

2.2: Remedial History

Since 1971, the Suffolk County Departments of Health Services and Environmental Control have investigated municipal waste landfills as potential sources of groundwater contamination. Landfills may

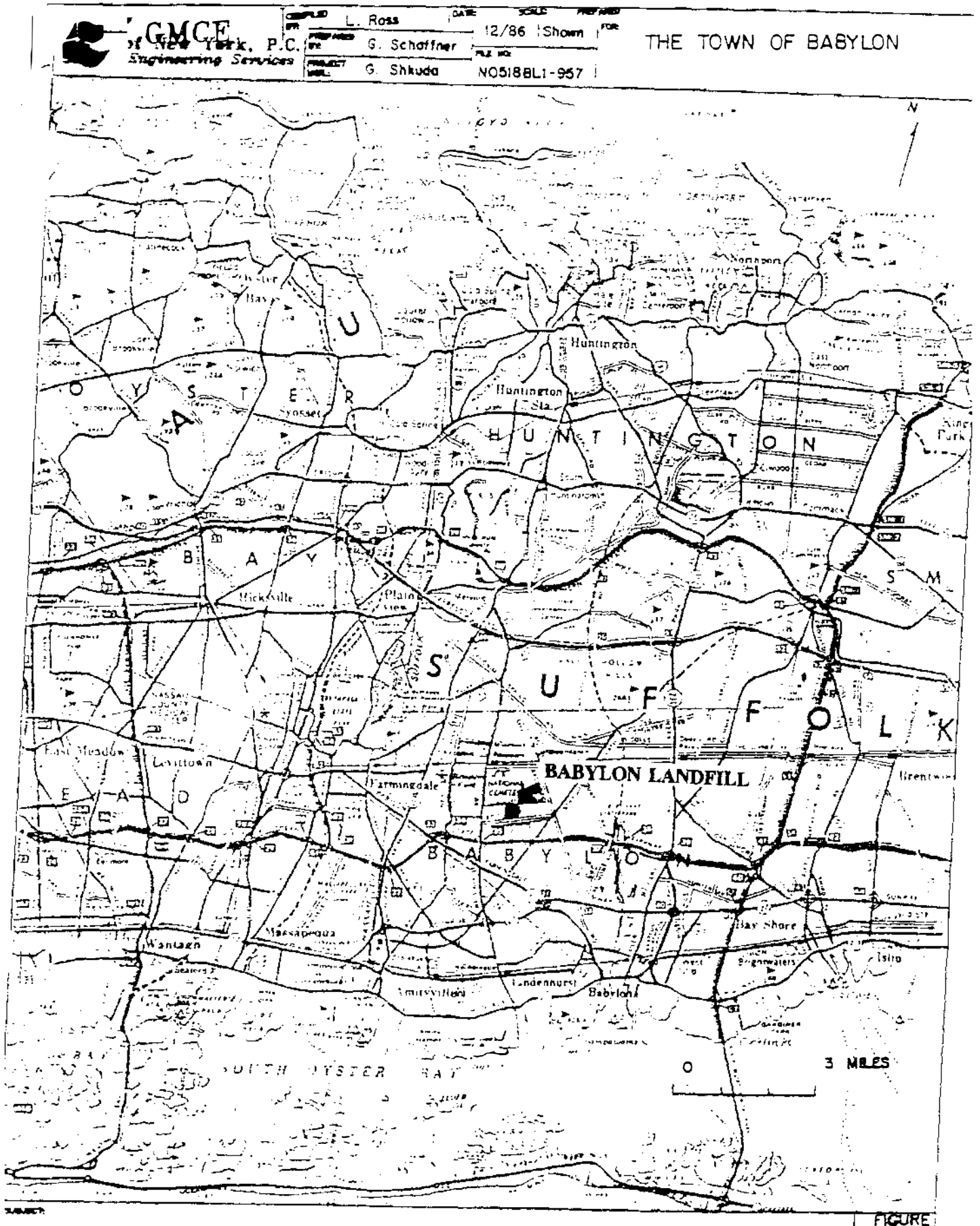

FIGURE 1

SITE LOCATION MAP

132720

TOWN OF BABYLON LANDFILL
SITE PLAN

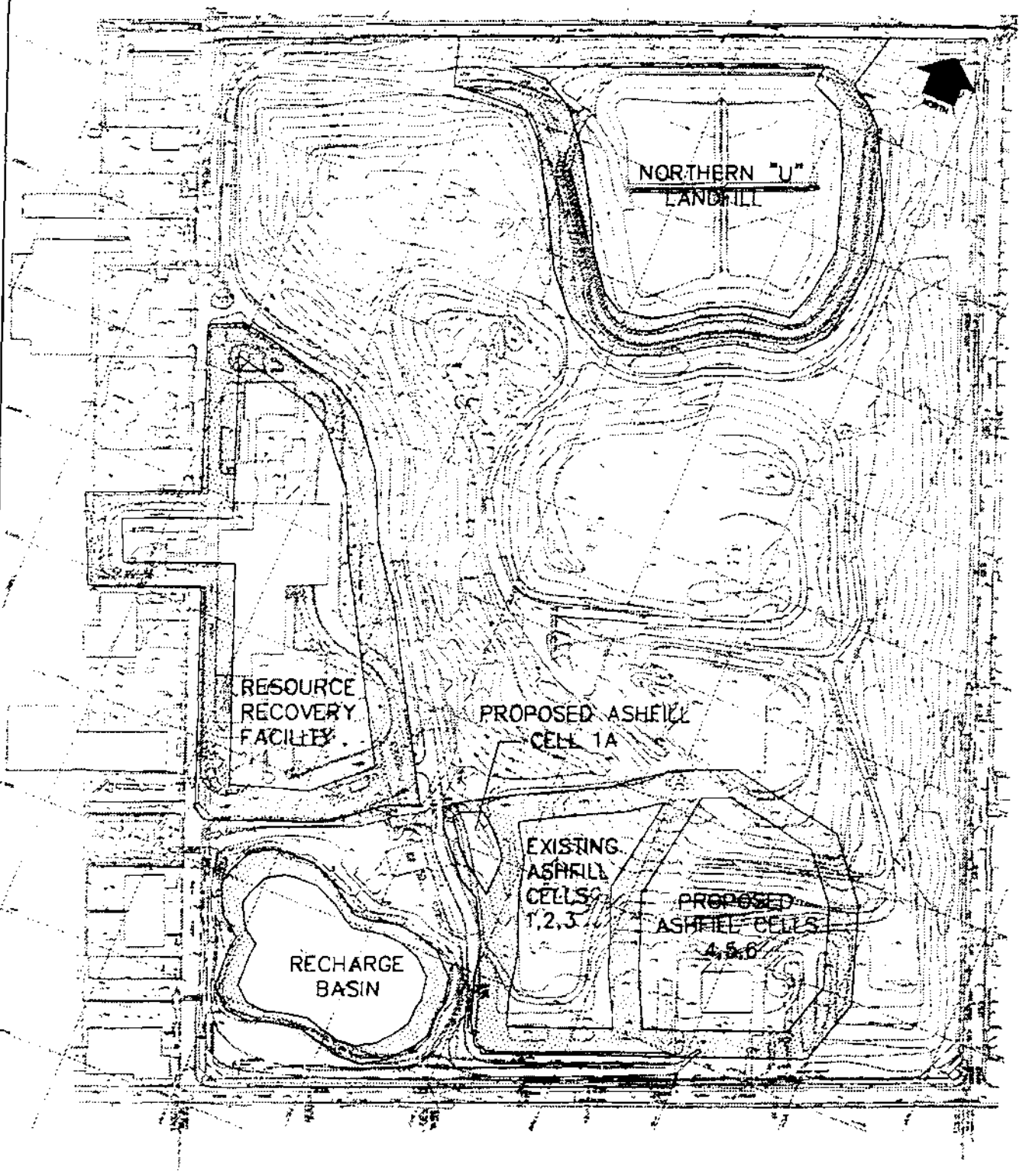

FIGURE 2

NOT TO SCALE

GeoSyntec Consultants
ATLANTA, GEORGIA

FIGURE NO.	
PROJECT NO.	3300-07
DOCUMENT NO.	GA930440
FILE NO.	3300-064

cause contamination of aquifers when rain or snow melt percolates through waste, leaching out pollutants and transporting them into groundwater. Water-impermeable bottom liners prevent leachate from migrating into groundwater, and are required on all new landfills. Older landfills, though not lined, may be covered with an impermeable cap to prevent the generation of leachate. Studies in 1980 and 1982 revealed leachate migration (through elevated bicarbonate, sulfate, ammonia, and hardness) to shallow groundwater south of the unlined Babylon Landfill. Hydrogeologic studies also confirmed groundwater in the area to be contaminated with volatile organic compounds (VOCs) in concentrations exceeding NYS standards, and indicated that the landfill was a possible source. Residential wells south of the landfill were abandoned and residences connected to a public water supply. The above studies, together with records of hazardous waste disposal in the landfill, resulted in the designation of the landfill on the NYS Registry of Hazardous Waste Sites as Class 2, a site posing "a significant threat to human health and/or the environment, requiring action".

The Town of Babylon has implemented various measures to control landfill impacts. Access to the site is controlled by fencing, and newer waste cells have been lined. A perimeter gas collection system was installed to prevent the migration of explosive landfill gas to adjacent properties. The most significant remedial action to date, however, is the selection and design of a cap for the landfill, under Operable Unit No. 1 (O.U. 1). Early results of the Remedial Investigation summarized in Section 3 of this ROD showed that it would be necessary to cap the landfill as part of the overall remedy for the site. Based on a November 1992 Focused Feasibility Study, DEC selected a cap design that would meet NYS landfill closure regulations and minimize short-term impacts to the community from construction. Following DEC's February 1993 Record of Decision for O.U.1, plans and specifications were developed for the cap. With DEC approval, the Town of Babylon solicited bids in September 1993 for construction services and a contract award was made in November 1993 to begin the work.

SECTION 3: CURRENT STATUS

The Town of Babylon, overseen and partially funded by NYSDEC under the 1986 Environmental Quality Bond Act (EQBA) Title 3 Program, initiated a Remedial Investigation/ Feasibility Study (RI/FS) in December 1989 to address the contamination at the site.

3.1: 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 RI was conducted in one phase between December 1989 and April 1991. Details of RI field activities and findings are described in a series of reports prepared by Geraghty and Miller and RTP Environmental Associates. Appendix A lists these reports.

The RI activities consisted of the following:

- Installation of soil borings and monitoring wells for analysis of groundwater as well as physical properties of soil and hydrogeologic conditions.

- Ambient air and perimeter gas vent sampling.

- Analysis of surface water and sediment samples from the Tooker Avenue wetlands and Santapogue Creek.

The analytical data obtained from the RI was compared to Applicable Standards, Criteria, and Guidance (SCGs) in determining remedial alternatives. Groundwater, drinking water and surface water SCGs identified for the Babylon Landfill site were based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part V of NYS Sanitary Code. For the evaluation and interpretation of sediment analytical results, NYSDEC sediment cleanup guidelines, background conditions, and risk-based remediation criteria were used to develop remediation goals for sediment.

Based upon the results of the remedial investigation in comparison to the SCGs, certain areas and media of the site require remediation.

Groundwater: Monitoring well sample results over two rounds showed a plume of contaminated groundwater, as shown by elevated ammonia, total dissolved solids, and other leachate indicators, plus metals, extending 2.4 miles south of the landfill with a maximum width of 0.5 miles. Alkalinity, a landfill leachate indicator, was found at a maximum concentration of 750 milligrams per liter (mg/L) in the plume zone and 14 mg/L in the upgradient well. Figure 3 depicts the landfill plume as shown by elevated alkalinity. Iron, a metal whose groundwater standard is 300 micrograms per liter (ug/L), was noted up to 74,300 ug/L in the landfill plume versus up to 1400 ug/L upgradient and side-gradient of the landfill. Concentrations of the metals manganese and sodium also greatly exceeded groundwater standards and were observed in an elevated pattern downgradient of the landfill. The metals lead, cadmium, chromium, zinc, and arsenic were detected less frequently in general and exceeded standards to a much lesser degree. The detections of these metals, moreover, followed a random pattern that does not clearly indicate the landfill as their source. The RI reports point out, however, that these metals may occur naturally in area soils and chemical constituents of the plume may cause them to become more mobile in groundwater. Table 1 summarizes the most frequently detected contaminants in groundwater.

The groundwater plume also extends vertically through the Upper Glacial Aquifer to a depth of 90 feet below land surface. A clay layer at this depth largely separates the Upper Glacial Aquifer from the Magothy Aquifer, where public supply wells are screened. RI results indicate that alkalinity and other leachate indicators are significantly reduced in the Magothy Aquifer as compared with the Upper Glacial Aquifer in the plume zone. However, at several Magothy monitoring wells, leachate indicators, plus iron, manganese and sodium, were elevated with respect to background and exceeded SCGs, showing that the clay layer may leak or be discontinuous. Groundwater sampling results have shown overall that the landfill has adversely impacted the Upper Glacial Aquifer, and is continuing to adversely impact the quality of the Magothy Aquifer, the area's major source of drinking water.

In addition to the above plume of landfill leachate, plumes of VOCs, principally trichloroethene and tetrachloroethene, were discovered during the RI in the Upper Glacial Aquifer. These plumes, as indicated on Figure 4, appear to have separate origins from the landfill. DEC is currently investigating the origins of these VOC plumes.

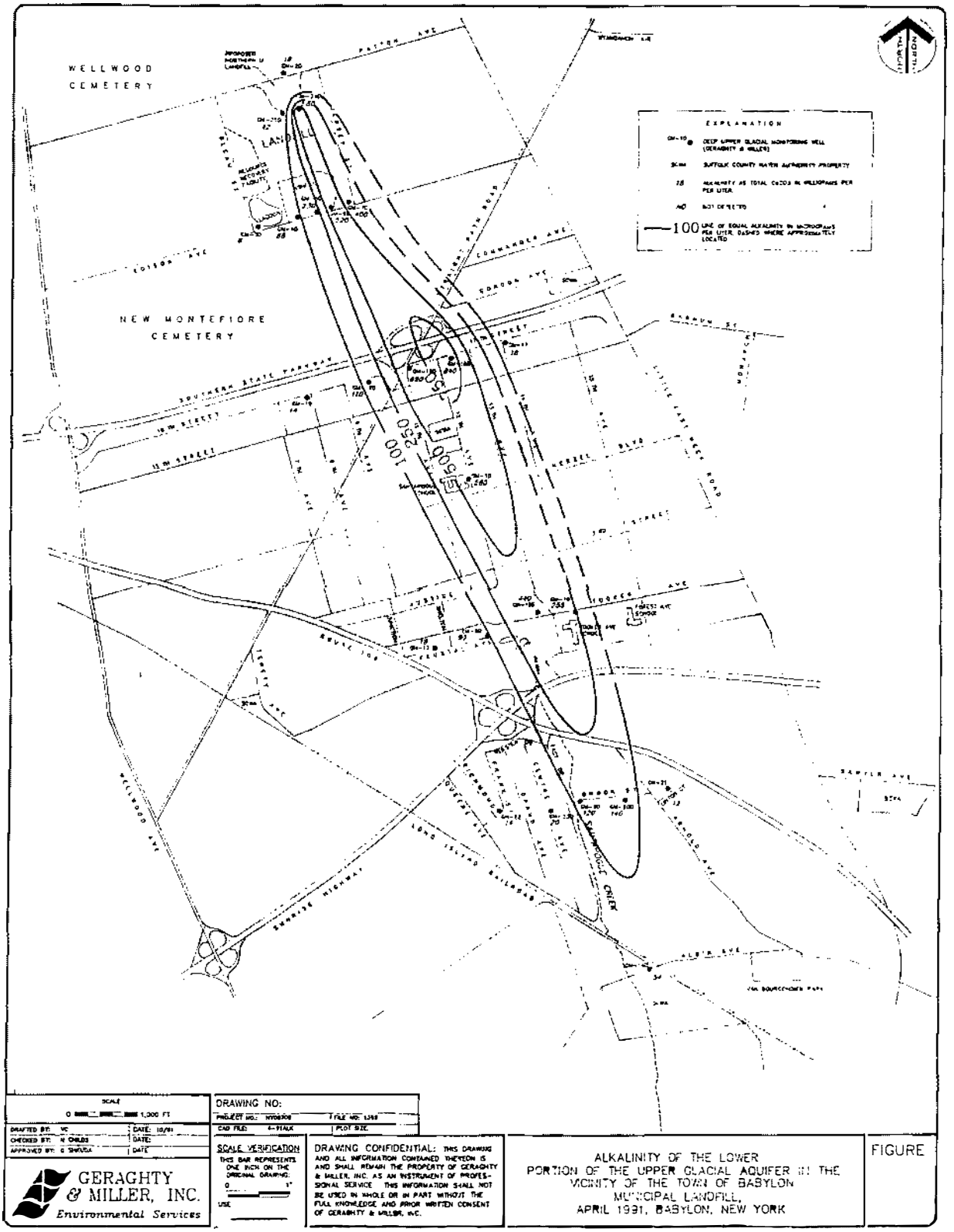
WELLWOOD CEMETERY
NEW MONTEFIORE CEMETERY
LANDFILL
EXPLANATION
DEEP UPPER GLACIAL MONITORING WELL (GERAGHTY & MILLER)
SUFFOLK COUNTY WATER AUTHORITY PROPERTY
ALKALINITY AS TOTAL CaCO3 IN MILLIGRAMS PER LITER
NO DETECTS
100 LINE OF EQUAL ALKALINITY IN MICROGRAMS PER LITER, DASHED WHERE APPROXIMATELY LOCATED
SOUTHERN STATE PARKWAY
SUNRISE HIGHWAY
LONG ISLAND RAILROAD
SOUTH OCEAN AVE
MONTAUK HWY
SCALE
0 1,000 FT
DRAWING NO:
PROJECT NO.: NY0930
FILE NO: 1368
CAD FILE: 6-91AUX
PLOT SIZE:
DRAFTED BY: VC
DATE: 10/91
CHECKED BY: N CHILDS
DATE:
APPROVED BY: G SHIVDA
DATE
GERAGHTY & MILLER, INC.
Environmental Services
SCALE VERIFICATION
THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING.
0 1"
USE
DRAWING CONFIDENTIAL: THIS DRAWING AND ALL INFORMATION CONTAINED THEREON IS AND SHALL REMAIN THE PROPERTY OF GERAGHTY & MILLER, INC. AS AN INSTRUMENT OF PROFESSIONAL SERVICE. THIS INFORMATION SHALL NOT BE USED IN WHOLE OR IN PART WITHOUT THE FULL KNOWLEDGE AND PRIOR WRITTEN CONSENT OF GERAGHTY & MILLER, INC.
ALKALINITY OF THE LOWER PORTION OF THE UPPER GLACIAL AQUIFER IN THE VICINITY OF THE TOWN OF BABYLON MUNICIPAL LANDFILL, APRIL 1991, BABYLON, NEW YORK
FIGURE

FIGURE 3

TABLE 1

SUMMARY OF MAJOR LANDFILL-DERIVED CONTAMINANTS
DETECTED IN GROUNDWATER
DURING THE BABYLON LANDFILL REMEDIAL INVESTIGATION
(All concentrations in micrograms/liter)

Contaminant	Upgradient Maximum	Downgradient Range	New York SCG
Iron (1)	1,950	ND - 74,300	300
Manganese	77.8	ND -15,300	300
Sodium	11,800	9,100 - 246,000	20,000
Total Dissolved Solids	140	540,000 - 6,000,000	500,000
Total Phenols	ND	8 - 88	1

Notes:
(1) In the case of metals (e.g. iron, manganese, sodium, and cadmium), both filtered and unfiltered groundwater samples were analyzed. Values reflect the highest detection regardless of whether filtered or unfiltered.

(2) "ND" means Not Detected.

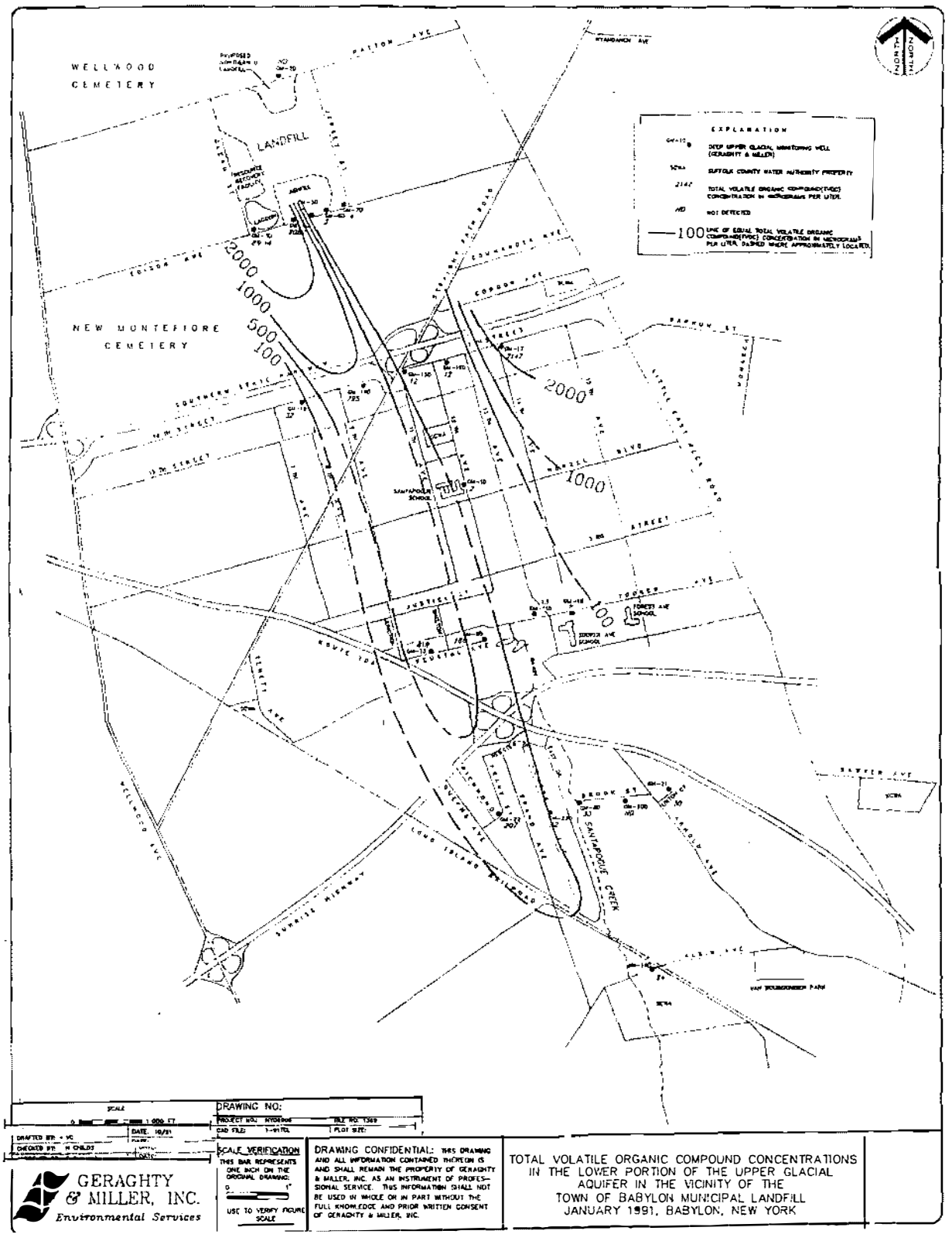
WELLWOOD CEMETERY
NEW MONTEFIORE CEMETERY
LANDFILL
EXPLANATION
DEEP UPPER GLACIAL MONITORING WELL (GERAGHTY & MILLER)
SCWA
SUFFOLK COUNTY WATER AUTHORITY PROPERTY
TOTAL VOLATILE ORGANIC COMPOUND(TVOC) CONCENTRATION IN MICROGRAMS PER LITER
ND
NOT DETECTED
100 LINE OF EQUAL TOTAL VOLATILE ORGANIC COMPOUND(TVOC) CONCENTRATION IN MICROGRAMS PER LITER, DASHED WHERE APPROXIMATELY LOCATED
2000
1000
500
100
SANTAPOGUE CREEK
SCALE
DRAWING NO:
PROJECT NO.
DATE
DRAFTED BY
CHECKED BY
SCALE VERIFICATION
USE TO VERIFY FIGURE SCALE
DRAWING CONFIDENTIAL: THIS DRAWING AND ALL INFORMATION CONTAINED THEREON IS AND SHALL REMAIN THE PROPERTY OF GERAGHTY & MILLER, INC. AS AN INSTRUMENT OF PROFESSIONAL SERVICE. THIS INFORMATION SHALL NOT BE USED IN WHOLE OR IN PART WITHOUT THE FULL KNOWLEDGE AND PRIOR WRITTEN CONSENT OF GERAGHTY & MILLER, INC.
GERAGHTY & MILLER, INC.
Environmental Services
TOTAL VOLATILE ORGANIC COMPOUND CONCENTRATIONS IN THE LOWER PORTION OF THE UPPER GLACIAL AQUIFER IN THE VICINITY OF THE TOWN OF BABYLON MUNICIPAL LANDFILL JANUARY 1991, BABYLON, NEW YORK

FIGURE 4

Surface Water: The Tooker Avenue wetlands and Santapogue Creek are fed by groundwater. Surface water quality standards for ammonia, iron, and manganese were exceeded at most sampling locations. Leachate indicators and manganese were also detected in a diminishing pattern of concentration with downstream flow. This pattern, and the proximity of the plume (see Figure 3), indicate that the landfill is a contributing source of these contaminants. Mercury, lead, and cobalt also exceeded standards in surface water. Table 2 summarizes frequently-detected surface water contaminants.

Sediment: Sediments in Santapogue Creek and the Tooker Avenue wetlands frequently showed contamination by polycyclic aromatic hydrocarbons (PAHs), which did not appear in ground or surface water. Road runoff may contribute these compounds to sediments. Manganese in sediments exceeds a NYSDEC guidance value indicating a potential for impact to stream biota. Manganese, as with iron and ammonia, is associated with landfill leachate.

Air: The air pathway analysis performed for the landfill showed slight exceedances of NYSDEC long-term Ambient Guideline Concentrations (AGCs) for VOCs at various locations, but no pattern was discernable as to whether the landfill or another site is the source of the VOCs. Since the wastes beneath the cap will continue to generate gas, however, protection of air quality will be a focus of the long-term maintenance and monitoring plan for the landfill cap. The plan will ensure that the cap venting system, together with existing perimeter gas collection system, will prevent explosion hazards and control odorous or hazardous trace vapors in landfill gas.

3.2 Summary of Human Exposure Pathways:

As previously discussed, landfill contaminants have migrated to the Magothy aquifer, a major source of drinking water. Concentrations of landfill contaminants have not been detected in area public supply wells, however, above health-based standards. With frequent monitoring of all local supply wells under the NYS Sanitary Code, the possibility of ingestion of contaminated groundwater is unlikely. On the other hand, continued uncontrolled leachate emissions from the landfill could eventually impact local supply wells.

3.3 Summary of Environmental Exposure Pathways:

Landfill contaminants have migrated, through groundwater movement, into the Tooker Avenue wetlands and Santapogue Creek. Studies have shown the potential for impact to sensitive aquatic organisms, such as brook trout, from manganese at the surface water concentrations and sediment concentrations detected during the RI. Surface water standards based on protection of aquatic life were contravened for such contaminants as ammonia, lead, mercury and cobalt.

SECTION 4: ENFORCEMENT STATUS

The NYSDEC and the Town of Babylon entered into a Consent Order on July 27, 1989. The order obligates the Town of Babylon to implement a full remedial program for the Babylon Landfill and allows reimbursement to the Town of up to 75 percent of the eligible cost of the remediation.

TABLE 2

SUMMARY OF CONTAMINANTS FREQUENTLY DETECTED IN SURFACE WATER DURING THE BABYLON LANDFILL REMEDIAL INVESTIGATION
(All concentrations are in micrograms per liter)

Contaminant	Range	New York SCG
Iron (1)	ND - 2,240	300
Manganese	2,470 - 6,200	300
Sodium	42,700 - 64,700	no SCG
Ammonia	2,700 - 12,000	2,000-7,350 (2)
Mercury	0.2 (j) - 1.0 (j)	0.2

Notes:

(1) In the case of metals (e.g. iron, manganese, and sodium, and mercury), both filtered and unfiltered surface water samples were analyzed. Values reflect the highest detection regardless of whether filtered or unfiltered.

(2) The SCG for ammonia is temperature dependent and varies by sample location; a range is given for the Santapogue Creek sample locations.

(j) Estimated value; analyte present in the sample at a concentration below the method quantitation limit.

SECTION 5: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program for O.U. 2 have been established through the remedy selection process stated in 6NYCRR 375-1.10. These goals are established under the guideline of meeting all standards, criteria, and guidance (SCGs) and protecting human health and the environment.

At a minimum, the remedy selected should eliminate or mitigate all significant threats to the public health and to the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

- Mitigate the impacts of contaminated groundwater to the environment.
- Prevent, to the extent possible, migration of contaminants in the landfill to groundwater.
- Provide for attainment of SCGs for groundwater quality for landfill-derived contaminants.
- Provide for attainment of SCGs for surface water and sediment quality for landfill-derived contaminants.

SECTION 6: SUMMARY OF THE EVALUATION OF ALTERNATIVES

Potential remedial alternatives for the Babylon Landfill site were identified, screened and evaluated in a two-phase Feasibility Study. This evaluation is presented in the reports entitled "Tasks 8 and 9: Development and Screening of Alternatives (October 1992)" and Task 10: Detailed Analysis of Alternatives" (November 1993). In the summary of the detailed analysis that follows, DEC has modified the FS reports' description of alternatives to exclude the landfill cap, which was evaluated in the Proposed Plan for O.U. 1.

6.1: Description of Alternatives

The potential remedies are intended to address the contaminated groundwater, surface water and air at the site.

Alternative 1: No Further Action

The no further action alternative is evaluated as a procedural requirement and as a basis for comparison. This alternative recognizes the remediation of the site to be completed through implementation of the O.U. 1 remedy, the landfill cap. It requires continued environmental monitoring only, to evaluate the effectiveness of the remediation completed under O.U. 1.

Present Worth:	$4,020,000
Capital Cost:	$0
Annual:	$261,600
Time to Implement	0 years

This alternative would include no additional action beyond the capping of the site, which is in progress, and continued operation of the Resource Recovery Facility (RRF) supply well cluster situated on the southeast corner of the landfill property. The RRF supply well cluster draws an average of 250 gallons per minute (gpm) from the plume, providing a limited degree of plume capture. Captured groundwater is used in the RRF process; following evaporation of the water, nearly all of the contaminants remain and are disposed of with ash and other residuals in the lined ashfill. The Town's contractual agreement with Ogden-Martin Systems would ensure operation of the supply well for at least twenty years, beyond which (or in the event the contract ceased for other reasons) the Town would assume operation of the supply well. The annual costs reflect a groundwater monitoring program that would be instituted under this alternative and continue for a minimum period of 30 years.

Alternative 2: Modify RRF Supply Well, and Monitor

Present Worth:	$4,120,000
Capital Cost:	$88,000
Annual Cost:	$263,300
Time to Implement:	0.5 years

This alternative calls for modification of the existing RRF supply well system to provide better capture of on-site groundwater, while providing the same quantity of water (250 gpm) to the RRF. As demonstrated by groundwater modeling in the FS, two wells separated by a short distance, each pumping 125 gpm, would intercept a wider portion of the shallow groundwater that flows through buried waste at the site. Treatment of the extracted water would be addressed, as in Alternative 1, by its use in the RRF and proper disposal of RRF residuals.

Alternative 3: On-Site Groundwater Extraction, On-Site Treatment and Monitoring

Present Worth:	$34,100,000
Capital Cost:	$2,055,000
Annual Cost:	$2,059,000
Time to Implement:	1.0 years

The alternative would include, in addition to the monitoring program described under Alternative 1, extraction wells to draw from the Upper Glacial Aquifer an additional 240 gpm at the landfill boundary. Including the RRF supply well, the combined total pumpage of 490 gpm would prevent most of the contamination from on-site wastes from leaving the site boundary. It would be necessary, however, to treat the additional 240 gpm of contaminated groundwater prior to discharge in nearby recharge basins. A treatment process using aeration together with reverse osmosis would most cost-effectively reduce concentrations of iron, manganese, ammonia, and sodium and any other contaminants to SCGs prior to discharge back into the aquifer.

Alternative 4: Off-Site Groundwater Extraction, Off-Site Treatment and Discharge, Monitoring

Present Worth:	$81,200,000
Capital Cost:	$6,476,000
Annual Cost:	$4,856,000

Time to Implement: 1.5 years

This alternative would provide an array of extraction wells at the head of Santapogue Creek, near the leading edge of the plume, and a system of aeration and reverse osmosis to treat contaminated groundwater to SCGs prior to discharge into Santapogue Creek. A total of 920 gpm would be collected, treated and discharged. The purpose of collection at this off-site location is twofold: 1) to actively treat the existing off-site contamination (compared to the previous alternatives which rely upon natural attenuation of the plume) and 2) to prevent landfill contaminants from entering Santapogue Creek, thereby accelerating the restoration of the Creek. A monitoring program identical to that proposed in previous alternatives would measure the effectiveness of this alternative.

Alternative 4A: Off-Site Groundwater Extraction, Partial Treatment, Off-Site Discharge, Monitoring

Present Worth:	$24,800,000
Capital Cost:	$2,496,000
Annual Cost:	$1,453,000
Time to Implement:	1.5 years

This variation of Alternative 4 would provide less costly, but less thorough, treatment of the extracted groundwater. Only iron, manganese and to some extent, ammonia would be reduced to SCGs for surface water discharge through the aeration treatment proposed in this alternative. To meet the remedial objective of creek restoration, however, treatment of sodium in the groundwater is not necessary; the elimination of sodium treatment greatly reduces the capital cost and present worth of Alternative 4A as compared to Alternative 4. In other respects this alternative would be identical to Alternative 4.

6.2 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 (6NYCRR 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 contained in the Feasibility Study.

The first two evaluation criteria are termed threshold criteria and must be satisfied in order for an alternative to be considered for selection.

1. 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.

The RRF supply well cluster alone would not be sufficient to prevent continued degradation of the aquifer or possible future human exposure to landfill contaminants through groundwater transport. Combination of the RRF supply well with a full landfill cap in Alternative 1 would prevent nearly all of the generation and migration of leachate. This protection is enhanced by the modification of supply well pumping as proposed in Alternative 2 to intercept additional contaminant underflow. The most complete protection

of the aquifer and human health through leachate containment would be provided by Alternative 3. Alternatives 1, 2, and 3 provide for the gradual natural attenuation of the off-site plume to address existing aquifer contamination. The off-site plume under Alternatives 1, 2, and 3 would continue to discharge contaminated groundwater to Santapogue Creek, thus resulting in years of continued exceedances of surface water quality standards. These alternatives, therefore, would not be fully protective of the environment. Alternatives 4 and 4A, on the other hand, would ensure short-term elimination of contaminants from Santapogue Creek and prevention of further plume migration through active removal and treatment of off-site contamination. In this respect, Alternative 4 is the most protective of both human health and the environment. Alternative 4A would be less protective than Alternative 4 since it would allow continued discharge of contaminants (ammonia, sodium) to the creek.

2. Compliance with Applicable Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether or not a remedy will meet applicable environmental laws, regulations, standards, and guidance.

Landfill closure regulations, 6NYCRR Part 360, are met by the landfill cover selected under O.U. 1. Alternatives 1, 2, and 3 would facilitate restoration of the aquifer to quality standards through source control and on-site groundwater treatment, allowing contamination presently off-site in the Upper Glacial and upper Magothy Aquifers to naturally dissipate and degrade. Alternatives 1, 2, and 3, however, would not result in the attainment of surface water standards for years. Alternative 4 would promote more rapid achievement of surface water quality standards for landfill-derived contaminants, as well as prevent groundwater standards exceedances south of the current plume front. Alternative 4A, however, might not achieve standards for ammonia in surface water.

The next five "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of alternatives after implementation of the response actions. 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.

The RRF well together with a cap in Alternatives 1 and 2 would provide effective and reliable long-term containment of landfill contaminants and would allow the off-site plume to dissipate through natural processes. A minimum of six to twelve years, based on velocity of groundwater flow, would elapse before the center of the plume would reach Santapogue Creek. Therefore, the plume may continue to impact the creek for at least that interval of time, not counting the mitigating effects of natural attenuation. The progress of natural attenuation and any ongoing impact to surface water quality could be monitored through the well network installed during the RI. Alternative 3 would provide a comparable degree of effectiveness and reliability to Alternatives 1 and 2 in the long term, as contaminant leaching from buried wastes declines. Alternatives 4 and 4A would not, following elimination of the current off-site plume, provide greater protection of the creek from landfill plume constituents than alternatives focusing on the source of leachate (1, 2, and 3).

None of the alternatives considered for this Operable Unit contain permanent, irreversible treatment of source wastes; therefore, the long-term reliability and effectiveness of all of the above alternatives are dependent on maintenance of the landfill cap, groundwater extraction wells, and treatment systems. Should the RRF cease to operate, the supply well system would have to be replaced with extraction and treatment of an equal volume of groundwater to maintain the effectiveness of these alternatives.

4. 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.

The focus of all of the alternatives is on containment, versus treatment, of the landfill waste mass. The alternatives, however, would include various degrees of treatment of leachate.

The RRF well cluster would reduce the mobility and volume of metals in groundwater through evaporation onto ash residue from the RRF, which is placed in a lined landfill. The RRF is currently in compliance with air quality emissions standards and criteria, so that volatile groundwater contaminants are not being released to air in harmful amounts. Alternatives 1 and 2 would provide treatment solely in this manner. Alternative 3 would treat the excess of collected groundwater not needed by the RRF in an aeration and reverse osmosis system to immobilize and concentrate metals for proper off-site disposal. Granular activated carbon would immobilize any volatile organic compounds for off-site disposal or destruction. By intercepting the largest volume of contaminated groundwater, Alternative 4 would treat the largest amount of contaminants over time. Alternative 4A's treatment system, which lacks reverse osmosis, would only treat for iron, manganese, and any incidental VOCs.

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

Construction of the landfill cap is scheduled to take approximately 2.5 years (a longer time to construct than any of the O.U. 2 alternatives) and may impact the community through the generation of odors, dust, and construction nuisances. Measures to monitor and control odors, vapors and dust will be implemented, however, by the construction contractor. Alternative 2 would be more effective in the short term than Alternative 1, since it would provide a wider zone of capture of contaminant underflow as soon as implemented. Alternative 3 would capture still more groundwater and improve groundwater quality more quickly in the vicinity of the landfill. As discussed under Long-term Effectiveness, Alternatives 4 and 4A would prevent impacts from the off-site plume to surface water over at least the next six to twelve years and provide much earlier improvement of surface water quality than Alternatives 1, 2, and 3. The volume of discharge of treated off-site groundwater to Santapogue Creek is significant compared to creek flow, however, and could have negative environmental effects such as temperature changes or possible flooding.

6. Implementability. The technical and administrative feasibility of implementing each alternative is evaluated. Technically, this includes the difficulties associated with the construction, the reliability of the technology, and the ability to monitor the effectiveness of the remedy. Administratively, the availability of the necessary personal and material is evaluated along with potential difficulties in obtaining special permits, access for construction, etc.

The technologies proposed in all of the alternatives are well established and many vendors would be available to provide competitive bids for materials and services. The alternatives for which other remedial activities take place on the landfill or other Town-owned property (Alternatives 1, 2, and 3) would be easier to implement than those requiring easements or purchases of property for off-site extraction and treatment (Alternatives 4 and 4A). A monitoring program for off-site media could be implemented almost immediately (Alternative 1). Alternatives 1 and 2 would necessitate little or no change in current use of the landfill property and facilities, however, compared to Alternative 3. Siting the Alternative 3 treatment plant and discharging large volumes of treated water on-site could present difficulties due to current activities. Discharge to Santapogue Creek in Alternatives 4 and 4A would require a permit and stringent monitoring, as well as a study to determine that the added volume of treated discharge to the creek will not cause harmful environmental effects. The alternatives including reverse osmosis treatment (Alternatives 3 and 4) would require frequent maintenance, as reflected in annual and present worth estimates. Overall, the most readily implementable alternatives would be first, Alternative 1, then Alternative 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 3.

SECTION 7: SUMMARY OF THE SELECTED REMEDY

Based upon the results of the RI/FS, and the evaluation presented in Section 7, the NYSDEC has selected Alternative 2 as the remedy for this site.

This selection is based upon the ability of Alternative 2 to substantially meet the threshold criteria (it will not be fully protective of Santapogue Creek, as discussed further below), and to provide the best balance of trade-offs with respect to the remaining criteria. The cap and enhancement of existing groundwater extraction at the site will contain the source of contamination effectively over the short and long term, and provides treatment of some landfill contaminants. Existing off-site contamination is expected to naturally degrade and dissipate (as will be verified with long-term ground and surface water sampling). Off-site contamination, however, will continue to cause contravention of surface water standards and a significant risk to aquatic life for years following implementation. Implementation of off-site measures, as in Alternatives 4 and 4A, would be extremely costly and would only address a portion of the total contamination impacting aquatic life in the Creek. The creek is undoubtedly affected by the VOC groundwater plumes originating in the Pinelawn Industrial Area, by road runoff, and many other sources than the Babylon Landfill.

Alternative 1, comparable to Alternative 2 in scope and cost, is less effective and protective than Alternative 2. Alternative 3, compared to Alternative 2, does not appear to provide significantly greater environmental or health protection. Finally, Alternatives 3, 4, and 4A may encounter obstacles to implementation, including significant capital and annual costs, which could render these alternatives infeasible.

TABLE 3

COST COMPARISON OF ALTERNATIVES

Alternative	Capital Cost	Annual Cost (a)	Present Worth (b)
Alt. 1	$ 0	$ 261,600	$ 4,020,000
Alt. 2	$ 88,000	$ 263,300	$ 4,120,000
Alt. 3	$ 2,055,000	$ 2,059,000	$ 34,100,000
Alt. 4	$ 6,476,000	$ 4,856,000	$ 81,200,000
Alt. 4A	$ 2,496,000	$ 1,453,000	$ 24,800,000

Notes:

(a) Annual costs reflect monitoring of groundwater and surface water per year; plus operation and maintenance and an allowance for periodic equipment replacement.

(b) Based on a five percent discount rate over 30 years (the minimum required operation, maintenance and monitoring period).

(c) Estimated landfill cap costs under O.U. 1 are as follows:

Capital: $21,200,000
Annual Maintenance: $25,400
Present Worth: $21,580,000

The estimated present worth cost to implement the remedy is $4,120,000. The cost to construct the remedy is estimated to be $88,000 and the estimated average annual cost to operate and maintain the remedy and to monitor ground and surface water quality, is $263,000.

The elements of the selected remedy are as follows:

- 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. Uncertainties identified during the RI/FS will be resolved.

- Modification of the RRF supply well to enhance capture of contaminated groundwater at the landfill boundary.

- Initiation of a monitoring program for ground and surface water, and landfill gas emissions.

- An annual review by DEC of the effectiveness of the remedy, as indicated by the results of the monitoring program. Further remedial action will be evaluated and implemented if the remedy is not found to be protective of human health and the environment.

SECTION 8: HIGHLIGHTS OF COMMUNITY PARTICIPATION

The FS reports, the Proposed Remedial Action Plan (PRAP), and supporting documentation for O.U. 2 were made available to the public for a comment period which began on January 24, 1994 and concluded on February 23, 1994. A public meeting was held during the comment period in the Town Hall Annex Auditorium, 281 Phelps Lane, North Babylon, on February 3, 1994 at 7:30 p.m. to present the conclusions of the FS and to receive comments.

Comments received at the public meeting, as well as written comments, have been documented in the Responsiveness Summary (Appendix B).

Previous activities for the Babylon Landfill remedial program have included the development of a site-specific Citizen Participation Plan (CPP), creation and maintenance of information repositories and the public contact list, and mass mailings of notices or fact sheets to notify the community of meetings, major milestones or the availability of documents. Previous meetings for the site have included a public meeting in January 1990 to present the work plan for the Remedial Investigation and (at that time) site-wide Feasibility Study; concerning Operable Unit No. 1, a public meeting on January 13, 1993 and thirty-day comment period were held to solicit comment on the proposed remedy, followed in June 1993 by an availability session and comment period concerning the draft plans and specifications for the OU-1 remedy.

APPENDIX B
RESPONSIVENESS SUMMARY
BABYLON LANDFILL, SITE NO. 1-52-039
OPERABLE UNIT NO. 2

Introduction

A responsiveness summary is required by New York State Department of Environmental Conservation (DEC) policy and defined in 6NYCRR Part 375-1.5 (c) as part of the Record of Decision (ROD) for the Babylon Landfill Inactive Hazardous Waste Site, Operable Unit No. 2 (OU-2). It provides a summary of citizens' comments and concerns received during the public comment period, and DEC's responses to these comments and concerns. All comments summarized in this document have been considered in DEC's final selection of a remedial action for OU-2.

Summary of Citizen Participation

For the purpose of announcing and soliciting public comment on the alternatives for remedial action, DEC issued a Proposed Remedial Action Plan (PRAP) on January 24, 1994 to provide background on the site, describe the alternatives, state DEC's preferred alternative based on technical review, and to request comments. Local document repositories were supplied with the PRAP as well as pertinent study reports for OU-2, especially the Feasibility Study (FS) reports ("Task 8 and 9: Development and Screening of Alternatives" and "Task 10: Detailed Analysis of Alternatives"). A thirty-day comment period was advertised through press notices, and a fact sheet/announcement mailed to a contact list of nearby residents, businesses and property owners, as well as municipal and state elected officials, health and environmental protection agencies, civic and environmental interest groups and any others who had previously identified themselves to DEC as having interest in the Babylon Landfill. The comment period for the OU-2 PRAP extended from January 24, 1994 to February 23, 1994.

During the comment period, on February 3, 1994, DEC held a public meeting at the Babylon Town Hall Annex Auditorium, North Babylon, to present the alternatives and to receive comments. A transcript of the meeting was prepared and is included in the Administrative Record for the site (Appendix A of the ROD); written comments received during the public comment period also are included in the Administrative Record. Administrative Record documents are available for public review at the local document repositories or by contacting DEC.

Commentors on the PRAP included property and business owners near the landfill, the Suffolk County Black Caucus, and the Suffolk County Water Authority. Comments focused not only upon the landfill remedial program, but on the impacts to health, water quality and property values from other inactive hazardous waste sites in the local area.

Summary of Comments and DEC Responses

Comment No. 1: The Suffolk County Water Authority (SCWA) expressed concern about how the groundwater monitoring portion of the proposed remedy would be carried out, and how would the decision be made to implement additional remedial action if necessary to protect drinking water supplies. What remedial actions would be taken, in particular, should SCWA wells be contaminated by the landfill plume?

Response: A preliminary monitoring plan has been developed as part of the Feasibility Study (see Appendix B of the November 1993 report "Task 10: Detailed Evaluation of Remedial Alternatives"). This preliminary plan is based on the requirements of 6NYCRR Part 360, Solid Waste Management Facilities Regulations, for long-term monitoring of ground and surface water near municipal solid waste landfills. Monitoring wells and surface water in the vicinity of the site will be sampled on a quarterly basis for several metals and indicator compounds, and once a year for a more expanded list of potential contaminants. The list of required monitoring analytes in Part 360 includes all of the compounds found in the Babylon Landfill plume. By adhering to Part 360 monitoring requirements at this site, the effectiveness of the selected remedy can be assessed and the movement of the plume toward supply well intake zones detected early.

A detailed contingency plan has not been developed for action should the long-term monitoring program show need. As stated in the ROD, DEC will conduct an annual review of the effectiveness of the remedy, as indicated by monitoring results, to determine if further action should be evaluated and implemented. Criteria for considering further remediation, such as "action levels" for specific contaminants, will be discussed at the time of the Town of Babylon's submission of a final Operation, Maintenance and Monitoring (OMM) Plan for the landfill. An acceptable OMM plan must include a contingency plan for failure of any components of the remedy and a means by which DEC can determine additional action must be implemented.

DEC will make all monitoring data from the Babylon Landfill available to the interested or affected public through the information repositories.

Comment #2: Some residences in the area, particularly those north and east of the industrial park where the landfill is located, use private water supply wells. People using these private wells complain about the water quality. How does DEC know the landfill plume might not be spreading in the direction of these residences? The Town should consider providing public water to these homes.

Response: DEC's understanding of the landfill plume, or zone of

groundwater impacted by the landfill, is based on the data gathered concerning the soils beneath the landfill and off-site areas and on water flow through these soils, as well as chemical analysis of groundwater. Working from studies of groundwater quality in Wyandanch and West Babylon in the 1970s and 1980s, the Town's consultant for the Remedial Investigation located wells to the south and southeast of the landfill, where a landfill plume had been discovered previously. Landfills generate characteristic groundwater contaminants, such as high iron, manganese, alkalinity, sodium, and ammonia. Through the well network installed during the Remedial Investigation, the location of the landfill plume was confirmed by the pattern of these landfill pollution indicators. In addition, the direction and speed of flow of groundwater and the plume were calculated using levels of water in the wells and information about the soil.

Contaminant plumes in groundwater primarily spread out in the same direction as groundwater flow. Movement of contaminants in other directions is usually very limited. An assessment of how contaminants have migrated from the Babylon Landfill can be seen in the plume maps generated during the Remedial Investigation, which show the plume after it appears after forty years of landfill operation. The plume has migrated in the same direction as groundwater, toward the south, for about 2.5 miles. Compared to its southern movement, the plume has spread out to the east and west to at most a half-mile width south of Edison Avenue, and no northern migration has been detected. Historically, therefore, the landfill is not likely to have affected groundwater quality to the north or east. With the closure of the landfill and remedial activities to cut off further generation of the plume, the possibility of future impact to those areas is remote.

Many other sources of groundwater contamination have been documented in the Wyandanch-West Babylon area that may have caused the deterioration of residential well water quality. Groundwater quality and the potential for residential exposure to contaminants is an ongoing concern of the Suffolk County Department of Health Services (SCDHS), which has conducted sampling and identified areas of affected groundwater. Citizens with concerns about their private wells are encouraged to contact the SCDHS to arrange for well sampling and analysis and for general information on water quality in their locale.

Comment #3: Upon review of the various alternatives developed for OU 2, it is evident that DEC has neglected to address the impacts of the landfill (in particular, the plume) on properties immediately east of the landfill on Jersey Street. The health effects have not been adequately addressed; nor has the potential liability of adjacent property owners for landfill-generated contamination been considered in DEC's evaluation. At a minimum, monitoring wells should have been installed along Jersey Street and

water quality results from these wells included in the Remedial Investigation/Feasibility Study to confirm the extent of contamination toward the east. The remedy for OU-2 should not be selected until this is done and additional remedial action is evaluated to ensure Jersey Street properties will not be affected by the landfill in the future.

Response: It is DEC's judgment that adequate data exist to assess the impact of the landfill plume on off-site properties and to select a protective remedy. These data are included in the RI/FS for the Babylon Landfill, and in the September 1992 report, "Volatile Organic Contaminant Plume Tracking Investigation in the Vicinity of the Babylon Landfill, Town of Babylon, New York" (prepared by Engineering-Science, Inc. under contract to DEC). Babylon Landfill Remedial Investigation data showing the absence of volatile organic compounds (VOCs) emanating from the landfill were confirmed by the separate VOC plume tracking study, wherein actual groundwater samples were obtained along Jersey Street and other locations throughout the Pinelawn Industrial Area. The Remedial Investigation did conclude that the leachate plume from the landfill extends beneath properties immediately east of the site; this migration is implied by results from wells installed to the south. Analysis of well samples show the landfill leachate plume to consist primarily of iron, manganese, and sodium, which exceed groundwater standards that are based on taste, odor, or dietary considerations. Groundwater is found in the landfill vicinity at approximately 15 feet below ground surface. For that reason, no potential for exposure to landfill-impacted groundwater would exist on adjacent properties unless the owners were to install supply wells. Therefore, the issue of health effects to anyone with a home or business located over the plume has been addressed in OU-2.

The RI/FS results, as summarized by DEC in both OU-1 and OU-2 Records of Decision, clearly show the landfill, not adjacent properties, to be the source of the landfill plume. Liability for cleanup of a plume ordinarily rests with the owner or operator of its source (or parties responsible for storage or disposal of hazardous waste at the source). Concerning VOCs, sources of VOC plumes in the area have been delineated in DEC's VOC Plume Tracking Investigation. Area property owners who have not owned, operated or contributed waste to these sources should not fear being held liable for cleanup of the VOC plumes regardless of whether their properties are located over the plumes. Concerned property owners may contact DEC's Division of Hazardous Waste Remediation, Bureau of Hazardous Site Control, for information concerning the status of their property with respect to the Plume Tracking Investigation in the Pinelawn Industrial Area and whether their property is considered a potential source of groundwater VOCs.

Comment #4: Several commentors stated that they are having difficulty selling or remortgaging properties they own near the

landfill.

Response: Affected property owners, realtors and banks should take note of DEC's determinations presented in the Records of Decision for OU-1 and OU-2, as well as the Plume Tracking Investigation, concerning sources (hence, liability) for contamination (see response to Comment #3 above). DEC cannot certify or make a formal determination that a given property is uncontaminated in the absence of sampling that property. Sampling of soil on off-site properties was not performed as part of the Babylon Landfill Remedial Investigation. The detailed review of the Babylon Landfill disposal history, sampling of on-site media, and study of migration pathways, however, does not lead DEC to the belief that landfill-related contamination exists on off-site properties.

Comment #5: A Jersey Street property owner pointed out that severe weather in March 1993 resulted in heavy erosion of landfill material onto his property. The Town or State had given him no assurance that all contamination had been removed following cleanup of the eroded material.

Response: As stated under the response to Comment #4, DEC cannot certify that off-site properties are uncontaminated unless actual sampling has been performed on the property. It is likely, however, that thorough cleanup and removal of sediments and other materials that were washed off the landfill would eliminate any possible contamination of the property caused by this incident. One of the purposes of the OU-1 remedy, the landfill cap currently under construction, is to prevent further occurrences of this nature.

Comment #6: How can the number of extraction wells in the proposed remedy be adequate for groundwater pollution control, compared to the volume and acreage of waste at the site? Only two wells drawing a combined 250 gallons per minute (gpm) are proposed for a 60-acre landfill, including some waste buried as deeply as 80 feet in former gravel pits on-site. The types of waste that went into these pits were not monitored and will cause an ongoing contamination problem not controllable by the proposed remedy; the only real solution is to remove this waste from out of the ground.

Response: The remedy for OU-2 consists of a modification of the existing extraction well on landfill property that draws water for use in the Town of Babylon Resource Recovery Facility, replacing the well with two wells at separate locations, each pumping at half the rate on average, so as to capture affected groundwater more efficiently. This remedy must be considered in combination with the landfill cap now being constructed under OU-1 and the evidence from the Remedial Investigation concerning the nature and extent of the plume. The landfill cap, as designed, will prevent 98 percent

of leachate generation from wastes located above the water table, allowing only a few gpm of leachate to reach groundwater. As for waste beneath the water table, its effect on groundwater can reasonably be documented by the Remedial Investigation sampling program, which has shown the effect of forty years of waste disposal at the site on groundwater. It is unlikely that the waste buried in on-site gravel pits would have any different future impact from that seen from past years of groundwater flowing through these wastes. The remedy for OU-2 targets capture of the residual few gpm of leachate from wastes above the water table and from shallow buried wastes, which are more likely to impact groundwater in the future than deeper waste that has already been "washed" by years of groundwater flow. To address shallow and above-ground waste, the proposed pumping scheme is very effective, based on the groundwater modeling performed in the OU-2 Feasibility Study. Compared to the proposed remedy, removing the buried wastes from the site would cause hazards to the local community (primarily from disturbance of wastes above ground), and would carry very high costs that might outweigh any long-term benefit.

Comment #7: A commentor stated his impression that the Resource Recovery Facility extraction well was intended to remediate all of the plume, not just control leachate migration from the landfill. Couldn't additional water be treated in the RRF for more plume capture?

Response: As designed by Ogden-Martin Systems, Inc., the on-site extraction well both provides supply water for the Resource Recovery Well and captures some of the contaminated groundwater emanating from the landfill property. The RRF does not "burn" captured water or treat it as a waste; rather, the RRF uses the water in its treatment process for solid wastes. The contaminants in the groundwater are removed by treatment or evaporation and disposed of with ash in the Town's lined ash landfill. Since the RRF has need of only a limited amount of water in the treatment process, only 250 gpm is drawn from the on-site well. Any additional groundwater extracted on or off-site would have to be treated in a separate treatment plant, as discussed in this Record of Decision for OU-2.

Although the existing well installed by Ogden-Martin Systems is not intended to remediate the off-site plume, plume maps developed during the Remedial Investigation show that the operation of this well since 1989 may be responsible for reducing concentrations of plume contaminants for approximately one thousand feet south of the site.

Comment #8: Won't the ash landfills in operation on the Babylon Landfill property, and the Northern U Bypass Landfill, contribute to groundwater contamination from the site?

Response: The new landfill cells are not expected to contribute significantly to groundwater contamination, since they were built, or are planned, with state-of-the-art double liners and collection systems for leachate. Upon closure of the new cells, they will be capped in a similar manner to the closed municipal waste landfill. The long-term monitoring program for the closed landfill will aid in detecting any failure of these systems.

Comment #9: Does some contamination in the general area of the landfill come from other sources? If so, DEC should approach cleanup of area groundwater in an organized manner, not in piecemeal attacks on individual plumes, considering the time involved and expense to taxpayers.

Response: Groundwater contamination in the West Babylon-Wyandanch area is derived from numerous spill, storage or disposal sites, including the former Fairchild Republic Aircraft plant, leaking gas station tanks, and several industries near the landfill and in East Farmingdale, in addition to the landfill itself. The DEC does consider the combined effects of these sites to the area as a whole in its remedial planning and enforcement strategies. The Department, however, is also obligated by State law to compel individual persons responsible for contamination to clean up the plumes they have caused.

Comment #10: Who is paying for these studies and the remediation of the landfill?

Response: The Town of Babylon is performing the RI/FS and remedial design and construction under a 1989 Order on Consent with DEC. The Order and the landfill's status on the State Registry of Inactive Hazardous Waste Sites as a "Class 2" site (a site considered to pose a significant threat to human health and/or the environment) make the Town eligible to receive up to 75 percent reimbursement from the State for capital costs to remediate the landfill, through the 1986 Environmental Quality Bond Act (EQBA), Title 3. Capital costs include the Remedial Investigation, the OU-1 Focused Feasibility Study and the OU-2 Feasibility Study, design and development of plans and specifications for the OU-1 and OU-2 remedies, construction of the remedies (including quality assurance and construction oversight), and development of the Operation, Maintenance and Monitoring Plan. Beyond these activities, no long-term sampling, maintenance or operation costs are eligible for EQBA Title 3 funding, although the Order on Consent obligates the Town to maintain and monitor the remedy for a minimum of thirty years or as long as necessary to ensure protection of public health and the environment. Eligibility for 75 percent reimbursement is also limited to costs strictly necessary for remediation and is subject to requirements and limits established by the Office of the State Comptroller.

Comment #11: The Town's enforcement relationship with the DEC (being bound by an Order on Consent), by releasing the Town from having to follow the process established under the State Environmental Quality Review Act (SEQRA), exempts the Town from having to address the needs and concerns of adjacent property owners in its remedial actions for the landfill.

Response: The 1989 Order on Consent, far from releasing the Town from any obligation to those affected by the landfill, requires the Town to ensure the protection of their health, safety, and environment from actual or potential landfill impacts. In addition, as a condition of receiving the EQBA Title 3 funding for their remedial efforts, the Town is obligated to assist the DEC in notifying adjacent property owners and other interested or affected citizens of remedial activities and involving such people in important remedial decisions. Remedy selection and citizen participation requirements are further spelled out in DEC's Inactive Hazardous Waste Site Regulations (6NYCRR Part 375). As stated in the public meeting, the public input requirements under 6NYCRR Part 375 meet or surpass those required under SEQRA.

Comment #12: A commentor requested that the Town suspend remedial construction during peak times of visitation at the cemetaries adjacent to the landfill. In the past, noise, dust and odors from the landfill have frequently created an unbearable nuisance to visitors.

Response: Town officials responded that the primary cause of odors in the recent past was likely the now-closed Town recycling facility on Alder Street in West Babylon. As for the landfill, the construction plans for the OU-1 cap require minimization of dust, noise, odor, and other nuisances off-site. The commentor and others are encouraged to contact the Town if construction activities are creating a nuisance. DEC or the State Department of Health may also be contacted about the landfill construction.

Comment #13: Apart from the public meeting and public comment period for OU-2, what recourse do property owners have to request additional investigative and/or remedial action for the off-site operable unit? Can another public meeting be held after DEC considers these requests and prior to a final decision concerning the OU-2 remedy?

Response: As discussed in the response to Comment #3, the DEC has adequate data and analysis from the combined OU-1 and OU-2 studies to support the selection of a protective remedy for OU-2. In accordance with 6NYCRR Part 375, opportunity for public input on the remedy selection has been created. No further meetings are appropriate, unless new and significant information were to emerge

that would significantly change the nature of the remedy DEC was considering (such as new and significant data concerning conditions on-site or landfill contamination off-site, leading to the need to consider a new and different alternative not previously described in the PRAP).

The citizen participation program for the site will continue through construction of the OU-2 remedy, into the monitoring and maintenance phase. Local information repositories will remain in operation and will be supplied with new reports and data as they become available. Interested or affected citizens are always free to comment on ongoing remedial activities for the landfill and are encouraged to contact the assigned DEC Citizen Participation Specialist to do so.