Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision

Sonia Road Landfill

Town of Islip, Suffolk County

Site Number 1-52-013

July 1998

New York State Department of Environmental Conservation

GEORGE E. PATAKI, *Governor* JOHN P. CAHILL, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

Sonia Road Landfill Inactive Hazardous Waste Site
Town of Islip, Nassau County, New York
Site No. 152013

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedial action for the Sonia Road 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 the Sonia Road 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 Sonia Road Landfill and the criteria identified for evaluation of alternatives the NYSDEC has selected capping and landfill gas control. 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. Any uncertainties identified during the RI/FS will be resolved.

- Construction of a Part 360 landfill cap, featuring a geotextile layer, a 12" gas venting layer, geomembrane hydraulic barrier, geocomposite drainage layer, 24" barrier protection layer, and a 6" vegetative growth medium or 6" stone/recycled concrete layer.

- An active gas collection system consisting of gas collection wells around the perimeter and gas recovery wells within the interior of the landfill. Extracted gas will be treated using a flare, if necessary.

- Because the remedy results in untreated hazardous waste remaining at the site, a long term monitoring program will be instituted. This program will allow the effectiveness of the selected remedy to be monitored and will be a component of the operation and maintenance for the site. The monitoring program, which will monitor groundwater and landfill gas, will be developed in accordance with 6 NYCRR Part 360 regulations.

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.

7/7/98
Date

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

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SECTION 1: SITE LOCATION AND DESCRIPTION

The Sonia Road Landfill is an inactive municipal solid waste landfill approximately 42 acres in size. The site is located in West Brentwood, in the Town of Islip, Suffolk County. As shown in Figure 1, the landfill is bordered on the south by Deer Park Street, on the west by Corbin Avenue, on the north by industrial properties and on the east by residential properties. The industrial area to the north includes properties which are also listed on the NYSDEC's registry of inactive hazardous waste sites.

Immediately to the southwest of the site along Udalls Road is the Brentwood West Middle School. The closest surface water is the headwater of Sampawams Creek located approximately 3,000 feet southwest of the landfill.

SECTION 2: SITE HISTORY

2.1: Operational/Disposal History

Prior to 1965 - The site was a sand and gravel mining facility. Sand and gravel was excavated below the water table, which created a groundwater lake at the site.

1965 - 1977 - The Town of Islip operated the site as a municipal solid waste landfill, with the most active period of disposal occurring between 1965 and 1974. During most of its operational period, the landfill accepted all types of municipal solid waste, however during the last few years of operation, the landfill accepted only refuse, rubbish, demolition material and yard waste, particularly leaves. Also, in the early years of operation, the site was used for disposal of junk automobiles.

1973 - 1974 - The landfill may have received approximately four hundred cubic yards of hazardous materials from Hooker Chemical Corporation. These wastes reportedly consisted of gravel containing polyvinyl chloride and gravel saturated with trimellitate plasticizer, 2-ethylhexanol, and other alcohols.

2.2: Remedial History

1975 - A study by Holzmacher, McLendon and Murrell (H2M) was conducted which included three test borings within the landfill. The borings indicated the presence of 29 - 35 feet of refuse, of which 6 - 10 feet was below the water table. Refuse consisted of wood, roots, glass, plastic, metal, cardboard, concrete, household wastes, and general rubbish.

1979 - Suffolk County Department of Health Services installed 19 temporary groundwater exploration wells at various locations southeast and downgradient of the site. Based on groundwater samples tested for temperature and specific conductivity, a leachate plume was delineated and reported to extend a distance of 3,800 feet toward the southeast.

1980 - Sonia Road Landfill was listed on the NYSDEC's original registry of inactive hazardous waste sites, with a Class 2 designation. A Class 2 site represents a significant (though not imminent) threat to public health or the environment.

1994 - NYSDEC conducted an Immediate Investigation Work Assignment which involved the installation of eight temporary monitoring wells along the perimeter of the landfill to assess groundwater quality. Based on the results of the study, the Class 2 designation was not changed.

SECTION 3: CURRENT STATUS

The Town of Islip, by order of the NYSDEC, initiated a Remedial Investigation/ Feasibility Study (RI/FS) in February 1997 to address contamination at the site.

3.1: Summary of the Remedial Investigation

The purpose of the remedial investigation was to define the nature and extent of any contamination resulting from waste disposal activities at the site.

The Final Remedial Investigation (RI) Report, dated April 1998, describes the field activities and findings of the remedial investigation in detail. A summary of the RI Report follows:

The remedial investigation consisted of the following:

- A site-wide grid system was established based on a 300-foot grid spacing network.

- Thirty soil vapor screening points were installed at the above-mentioned grid locations. The soil gas survey was conducted to monitor for the presence of volatile organic compounds (VOCs) and explosive gas. Locations that exhibited elevated measurements were also screened for percent methane, percent carbon dioxide and hydrogen sulfide. The Town of Islip also periodically conducts methane gas monitoring by obtaining gas samples from wells around the perimeter of the landfill consisting of 2 inch PVC casing and screen installed to a depth of 30 feet.

- Four surface soil samples were collected on-site to address concerns regarding potential surficial contamination. Three surface soil samples were collected off-site to characterize background surficial soil quality in the industrial and residential areas bordering the site. Each sample was collected from 0-2 inches below ground surface and analyzed for target compound list (TCL) + 30 organic parameters, target analyte list (TAL) metals and cyanide.

- Four soil borings were constructed on-site to determine the thickness of waste in the landfill and the depth of waste below groundwater. The borings also characterized the waste at the water table and the soil below the waste. One sample was collected for analysis from each boring. Two of the samples were analyzed for TCL + 30 organic parameters and TAL metals and cyanide and two of the samples were analyzed for Toxicity Characteristic Leaching Procedure (TCLP) parameters.

- 20 test pits, each approximately 6 feet long, 6 feet wide and 6 feet deep, were constructed on-site to provide information on the thickness of existing cover material.

- Test trenches were constructed at 34 locations approximately 150 feet apart around the perimeter of the landfill within the property boundary. Test trenches were excavated typically to a depth of

10 feet and a width of 4-6 feet, with the length ranging from 10 to 55 feet. The objective of the trenches was to determine the lateral extent and thickness of waste at the landfill perimeter.

- 28 additional test trenches were constructed for further waste delineation.

- Seven Hydropunch screening points were installed along the southern property boundary at approximately 300 foot intervals in order to screen groundwater quality immediately downgradient of the landfill. Groundwater samples were collected from each of the screening points and analyzed for select VOCs. Results of this screening effort were used to establish the placement of permanent groundwater monitoring wells and selection of screen depths.

- Thirty-one groundwater monitoring wells were installed at twelve cluster locations to monitor upgradient, on-site and downgradient groundwater quality. Each cluster location included three wells; a shallow well screened at the water table, an intermediate well screened approximately 70 feet below ground surface, and a deep well with screen depths ranging from 94 to 119 feet. The deep wells were screened just above the Gardiners clay confining unit. Samples were collected from the new wells and the five existing wells and analyzed for TCL + 30 organic parameters, TAL metals and cyanide, and leachate parameters. A second round of samples was collected and analyzed for a modified select group of parameters based on the results of previous sampling.

- Two rounds of water level measurements were collected in all monitoring wells to determine groundwater flow directions.

3.2: Nature and Extent of Contamination

To determine which media (soil, groundwater, etc.) contain contamination at levels of concern, the remedial investigation analytical data was compared to environmental Standards, Criteria, and Guidance (SCGs). Groundwater, drinking water and surface water SCGs identified for the Sonia Road Landfill were based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part V of the New York State Sanitary Code. For the evaluation and interpretation of soil analytical results, NYSDEC soil cleanup guidelines for the protection of groundwater, background conditions, and risk-based remediation criteria were used to develop remediation goals.

Based upon the results of the remedial investigation in comparison to the SCGs and potential public health and environmental exposure routes, certain areas and media of the site require remediation. These are summarized below. More complete information can be found in the RI Report.

Chemical concentrations are reported in parts per billion (ppb) and parts per million (ppm). For comparison purposes, SCGs are given for each medium.

Soil Vapor / Explosive Gas - No elevated levels of total VOCs were detected throughout the landfill. However, fourteen locations did indicate the presence of explosive gas. These fourteen locations, predominantly on the eastern side of the landfill, were screened again and indicated elevated concentrations of methane gas, as high as 58% methane gas by volume. Additional locations closest to the boundaries of the landfill were sampled and did not indicate the presence of methane gas and no methane has migrated off the property. The generation and presence of methane gas at solid waste landfills is not

unexpected and is the result of decomposition of organic materials such as grass clippings and food waste.

Surface Soils - Low levels of VOCs and pesticides were detected in on-site surface soil samples, although none were above soil cleanup objectives. Six of the seven samples indicated the presence of semivolatile compounds (SVOCs), specifically polycyclic aromatic hydrocarbons (PAHs), above the cleanup objective. PAHs are typically associated with incomplete combustion and are found in asphalt, cinder, coal and tar. Iron and zinc were also detected above cleanup objectives in all surface soil samples. Although on-site concentrations of SVOCs and metals were above the cleanup objectives for these parameters, on-site concentrations were consistent with off-site background samples. A summary of the compounds detected above soil cleanup objectives in surface soil is presented in Table 1.

Additionally, as part of a supplemental surface soil investigation to evaluate a limited area of stressed vegetation, which included a tar-like material, elevated levels of iron (29,100 ppm) and zinc (10,600 ppm) were detected. The soil cleanup objectives for these compounds are 2,000 ppm and 20 ppm respectively.

Subsurface Soil - Zinc was the only compound detected above the soil cleanup objective in the sample collected from subsurface soil. Sample SB-04 detected 54 ppm zinc. The NYSDEC soil cleanup objective is 20 ppm. Subsurface soil sample SB-04 was taken at a depth of forty-five feet below grade. The results of the TCLP analysis on subsurface soil showed non-detect for all compounds.

Groundwater - Upgradient and downgradient samples collected from the shallow, intermediate and deep groundwater indicate the presence of VOCs, metals, and leachate parameters that exceed groundwater standards. The most substantial contamination was found in the deep groundwater zone (approximately 110 feet below grade and atop the Gardiner's clay) at monitoring well location MW-06D. This location showed concentrations of the VOC tetrachloroethene as high as 1,600 ppb. Deep zone groundwater contamination at location MW-06D is believed to be from upgradient sources. A review of existing historical information and data regarding upgradient sites confirms similar contaminants and the potential for off-site migration towards the Sonia Road Landfill. In addition, both the shallow and intermediate depth wells at cluster 6 (MW-06S and MW-06I) had extremely low concentrations (less than 10 ppb) , indicating the contamination in MW-06D did not originate from the landfill.

Table 2 summarizes the extent of contamination for the contaminants of concern in the groundwater and compares the data with the remedial action levels (SCGs) for the site.

Figure 2 shows the location of and corresponding contaminant concentrations detected in each groundwater monitoring well.

3.3 Ecological Assessment:

To evaluate potential site risks to ecological receptors, an overall Habitat Based Assessment (HBA) was performed as an element of the remedial investigation. The HBA was conducted to provide a description of major habitat types / vegetative cover for the Sonia Road Landfill with associated wildlife populations, and identify any other significant on-site sources.

3.4 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 can be found in the Qualitative Risk Assessment document, dated April 1998.

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.

Potential human exposure pathways which may exist at the Sonia Road Landfill include:

1. Ingestion of Contaminated Groundwater - The groundwater is not expected to impact human health since all properties within approximately 1.5 miles downgradient of the landfill are supplied with public water (i.e., no private wells exist in this area). The distance to the nearest public water supply well is approximately two miles from the landfill and this supply well extracts drinking water from the Magothy aquifer, approximately 400 feet below grade and beneath the confining Gardiners clay unit. Given that the highest concentrations of groundwater contamination at the landfill were detected approximately 110 feet below grade and above the confining clay unit, this contamination is not expected to impact the nearest public water supply well. Therefore, the groundwater is not considered a pathway of concern.

2. Dermal (skin) contact / Incidental Ingestion of Soil - Surface soil sample results indicated concentrations of most contaminants that were consistent with background samples. There were however elevated levels of iron and zinc found in a limited area of stressed vegetation. Deeper (45 feet) soil samples obtained below the waste material showed only low levels of contaminants. Samples of the actual waste material indicated elevated concentrations of contaminants, typical of municipal solid waste. Since a cap will be installed on the landfill thereby preventing future contact with contaminated soils and waste material, this pathway is not considered a pathway of concern.

3. Inhalation of Airborne Contaminants in Ambient Air - Soil vapor screening for total volatile organic vapors and the analytical results of soil vapor samples did not indicate elevated levels of VOCs. Therefore, the release and subsequent inhalation of airborne contaminants is not a medium of concern for the Sonia Road Landfill.

4. Inhalation of Airborne Contaminants in Indoor Air - Based on perimeter methane monitoring results obtained during the investigation and previous methane monitoring conducted by the Town, landfill gas is being generated but is currently not moving laterally (or off site). However, experience suggests that the installation of a low permeability cap will enhance the potential for lateral movement of methane gas. Therefore, this is considered a potential human exposure pathway. However, the cap will include a gas collection system and monitoring program, along with a contingency plan which will prevent exposure to residents.

3.5 Summary of Environmental Exposure Pathways:

This section summarizes the types of environmental exposures which may be presented by the site.

No environmental exposure pathways have been identified at this time. There are no surface waters or mapped wetlands on or immediately adjacent to the landfill property. The Sampawams Creek is an environmental resource in close proximity to the site, located approximately 3,000 feet southwest of the landfill. The Creek is fed by groundwater discharge as well as storm water management systems for the surrounding areas.

Current site surface water drainage is accomplished by infiltration and percolation into the waste mass with ultimate discharge to the groundwater. Groundwater flow direction from the landfill was determined to be in a southeasterly direction, away from the Sampawams Creek. Therefore, the surface water and sediment of the Sampawams Creek is not expected to be impacted by the landfill and consequently was not sampled as part of this study.

SECTION 4: ENFORCEMENT STATUS

The NYSDEC and the Town of Islip entered into a Consent Order on March 27, 1996. The Order obligates the Town to implement a full remedial program and allows reimbursement to the Town of up to 75 percent of the eligible remediation cost.

SECTION 5: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375-1.10. The overall remedial goal is to meet all Standards, Criteria, and Guidance (SCGs) and be protective of 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.

The goals selected for the Sonia Road Landfill are:

- *Reduce, control, or eliminate to the extent practicable the contamination present within the soils/waste on site (generation of leachate within the fill mass).*
- *Eliminate the threat to surface waters by eliminating any future contaminated surface run-off from the contaminated soils on site.*
- *Eliminate the potential for direct human or animal contact with the contaminated soils on site.*
- *Mitigate the impacts of contaminated groundwater to the environment.*
- *Prevent, to the extent possible, migration of contaminants in the landfill to groundwater.*

- *Control landfill gas emissions to levels that are protective of on-site and off-site receptors.*

SECTION 6: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy should 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 Sonia Road Landfill were identified, screened and evaluated in a Feasibility Study. This evaluation is presented in the report entitled "Final Feasibility Study Report", dated April 1998.

A summary of the detailed analysis follows. As used in the following text, the time to implement reflects only the time required to implement the remedy, and does not include the time required to design the remedy, procure contracts for design and construction or to negotiate with responsible parties for implementation of the remedy.

6.1: Description of Alternatives

The potential remedies are intended to address the contaminated soils and groundwater at the site.

Alternative 1 - No Action

The no action alternative is evaluated as a procedural requirement and as a basis for comparison. It requires continued monitoring only, allowing the site to remain in an unremediated state. 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:	$450,000
Capital Cost:	$ 0
Annual O&M:	$ 30,000
Time to Implement:	3 months

Alternative 2 - Shallow and Deep Groundwater Treatment, Landfill Gas Control and Capping

Alternative 2 would address remediation of all media, including waste, subsurface soil, landfill gas, leachate impacted groundwater, and VOC-impacted groundwater.

Waste beyond the property line of the landfill would be excavated and placed within the boundary of the site and a low permeability cap would be installed over the entire landfill. The cap would consist of the following (from bottom to top): a geotextile layer, a twelve inch gas venting layer, a 60-mil High Density Polyethylene (HDPE) geomembrane, geocomposite drainage layer, 24 inch barrier protection layer, and a 6 inch vegetative growth medium or 6 inch stone / recycled concrete layer. An illustration of this cap is provided as Figure 3. The cap would prevent precipitation from migrating through the landfill and mitigate the generation of leachate and further contamination of the groundwater.

Remediation of landfill gas would be accomplished by placement of 4-inch PVC perimeter gas collection wells around the landfill and recovery wells within the interior of the landfill. If necessary to meet

emission standards or reduce odors, the extracted gas would be treated using a flare. This gas control system would prevent landfill gas from migrating off-site.

Groundwater contaminated by landfill leachate and VOCs from an upgradient source would be extracted and treated via aeration, sand filtration, and ion exchange. The treated effluent would be discharged to the Sampawams Creek or the Southwest Sewer District (SWSD).

Monitoring of groundwater and landfill gas for a 30 year period would be performed to determine the effectiveness of the remediation systems.

Present Worth:	$18,600,000
Capital Cost:	$14,300,000
Annual O&M:	$400,000
Time to Implement:	12 months

Alternative 3 - Shallow Groundwater Treatment, Landfill Gas Control, and Capping

Alternative 3 is identical to Alternative 2 with the exception that the deep groundwater contaminated with VOCs would not be extracted and treated.

Present Worth:	$18,250,000
Capital Cost:	$13,950,000
Annual O&M:	$400,000
Time to Implement:	12 months

Alternative 4 - Landfill Gas Control and Capping

Alternative 4 addresses remediation of waste, subsurface soil and landfill gas, but does not address remediation of groundwater.

The same low permeability cap and landfill gas collection system as described in Alternative 2 would be implemented. In addition, the same long term monitoring program would be conducted.

Present Worth:	$12,400,000
Capital Cost:	$11,050,000
Annual O&M:	$115,000
Time to Implement:	12 months

Alternative 5 - Capping

Alternative 5 addresses only remediation of the waste and subsurface soil.

A low permeability cap with passive vents would be installed and the same long-term groundwater monitoring program described in Alternatives 2 through 4 would be conducted.

Present Worth:	$10,950,000
Capital Cost:	$10,050,000
Annual O&M:	$ 115,000
Time to Implement:	12 months

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. 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.

One applicable criterion for landfill closure is a cap with a continuous single or double impermeable layer, as specified in 6 NYCRR Part 360. Because the no action alternative does not provide this, Alternative 1 does not comply with this criterion.

NYSDEC believes that groundwater standards would be met by a combination of a landfill cap and groundwater extraction and treatment (Alternatives 2 and 3). Alternative 2 would treat groundwater for those contaminants which exceed groundwater standards in both the shallow and deep zones. Alternative 3 treats only the groundwater impacted by landfill leachate, i.e., the shallow zone. The deeper groundwater contamination is not expected to impact public water supply wells downgradient and there are no users of private wells within a distance of approximately 1.5 miles downgradient.

It is anticipated that a Part 360 cap alone without groundwater extraction and treatment (Alternatives 4 and 5) would significantly reduce and ultimately prevent generation of landfill leachate and further contamination of the groundwater. Alternatives 4 and 5 would not treat contaminated groundwater.
Air quality standards are expected to be met by those alternatives that provide active gas collection (Alternatives 2, 3, and 4).

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.

Human health is protected by elimination of the routes of exposure identified in Section 4.4 as producing unacceptable health risks. Therefore, alternatives that prevent ingestion of contaminated groundwater, dermal (skin) contact / incidental ingestion of surface soils, and inhalation of airborne contaminants in ambient and indoor air are considered to be protective.

Alternatives that provide active landfill gas control and capping (Alternatives 2, 3, and 4) would eliminate all routes of exposure with the exception of ingestion of groundwater. But, as mentioned earlier, the groundwater is not expected to impact human health since no residents are drinking the contaminated groundwater. Alternative 2, which would extract and treat contaminated groundwater in the shallow and deep zones, would be completely protective of human health and the environment.

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

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.

Alternatives that provide for grading and capping the landfill will cause short term adverse impacts due to potential exposure to excavated wastes, contaminated runoff and airborne dusts and gases. Because the amount of waste regrading and time to implement is the same for the four capping options under consideration, short term impacts are similar for all alternatives.

4. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. For each alternative wastes or treated residuals would remain on site after the selected remedy has been implemented. Therefore none of the alternatives is considered permanent and long term effectiveness is evaluated based on 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.

Alternatives which provide groundwater extraction and treatment of contaminated groundwater would provide the highest degree of long term effectiveness. Groundwater extraction and treatment techniques have been proven effective and reliable. All of the technologies associated with the alternatives that provide for capping the landfill have also been proven effective and are reliable.

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. Because the alternatives under consideration generally involve containment technologies (capping), they reduce the mobility of contaminants by reducing leachate generation and restricting its flow.

Alternatives that include a Part 360 cap provide the greatest reduction in leachate generation. Alternatives that include groundwater treatment (Alternatives 2 and 3) provide the greatest reduction in contaminant mobility and do provide some reduction in volume because contaminated groundwater is extracted and

treated. However, the amount of contaminants treated would be a small percentage of the total amount of waste at the site.

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..

Technically, the technologies under consideration are well developed and reliable. The greatest technical difficulties for cap construction would be meeting Part 360 requirements of a 4% final slope. Also, accommodating surface water runoff would present a moderate design challenge.

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.

This final criterion is considered a modifying criterion and is taken into account after evaluating those above. It is focused upon after public comments on the Proposed Remedial Action Plan have been received.

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 responses to the concerns raised. In general the public comments received were supportive of the remedy. Several commentors disagreed with the proposed remedy, wanting to see groundwater contamination more actively addressed. DEC responded emphasizing the major conclusions of the RI/FS and providing commentors with information on remedial action planned for other area contaminant sources which contribute to this groundwater contamination more significantly than the Sonia Road Landfill. No change has been made to the proposed remedy in response to public comments.

SECTION 7: SUMMARY OF THE SELECTED REMEDY

Based upon the results of the RI/FS, and the evaluation presented in Section 6, the NYSDEC has selected Alternative 4: Landfill Gas Control and Capping as the remedy for the Sonia Road Landfill.

The selection of a Part 360 cap is based on the need to comply with applicable regulations. A Part 360 cap will also provide long term effectiveness by minimizing leachate generation and migration to groundwater, will actively collect and control landfill gas, and prevent any potential for contact with contaminated soils and waste material.

Although groundwater was found to be contaminated above standards, the selected remedy will not address treatment of this medium. The remedy will, however, prevent further groundwater contamination by landfill leachate, and groundwater monitoring will be continued. As discussed earlier, the groundwater is not considered a human exposure pathway of concern since the surrounding community is served by

public water; i.e., no one will drink the contaminated groundwater. Contaminants noted in the shallow zone and presumably derived from landfill leachate will be degraded and/or dissipate over time to background levels after capping. The VOC contamination in the deep zone is considered to be originating from upgradient sources. In response, the NYSDEC plans to conduct additional area-wide groundwater investigations upgradient of the landfill.

Conceptual Grading Plan: The Final Feasibility Study presented a conceptual grading plan that included top slopes of a 2% grade. Part 360 regulations specify a 4% final grade for recently deactivated landfills that may be subject to on-going settlement.

NYSDEC intends to grant a variance from the 4% grading requirement for a number of reasons. Among those are: a.) Given the age of the Sonia Road Landfill, most of the anticipated settlement has already occurred; b.) Considering the construction of the landfill (excavation below grade) and the existing topography, a 2% slope will require far less cutting, filling and shaping operations. Preliminary design calculations estimate that grading to a minimum slope of 4% throughout the site would require an additional 150,000 cubic yards of fill material; and c.) A 4% slope would significantly increase the height of the cap, up to 20 feet in certain locations, and change the visual aesthetics of the area.

NYSDEC will also consider allowing inert waste materials to be brought in from off site for grading purposes. Such materials include alternative grading materials (AGM), which include crushed and sorted road construction debris and inert demolition debris. Any such material will be carefully specified and monitored to ensure that putrescible materials, such as gypsum wallboard, and other hazardous materials are not mixed in. The final grading plan may include a combination of waste regrading and Alternate Grading Material.

NYSDEC believes that a variance from the 4% grading requirement will be desirable due to the above-mentioned reasons. The details of the variance and grading plan will be developed during remedial design.

Elements of the Selected Remedy: 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 will be resolved.

2. Construction of a Part 360 landfill cap, featuring a geotextile layer, a 12" gas venting layer, geomembrane hydraulic barrier, geocomposite drainage layer, 24" barrier protection layer, and a 6" vegetative growth medium or 6" stone/recycled concrete layer.

3. An active gas collection system consisting of gas collection wells around the perimeter and gas recovery wells within the interior of the landfill. Extracted gas will be treated using a flare, if necessary.

4. Because the remedy results in untreated hazardous waste remaining at the site, a long term monitoring program will be instituted. This program will allow the effectiveness of the selected remedy to be monitored and will be a component of the operation and maintenance for the site.

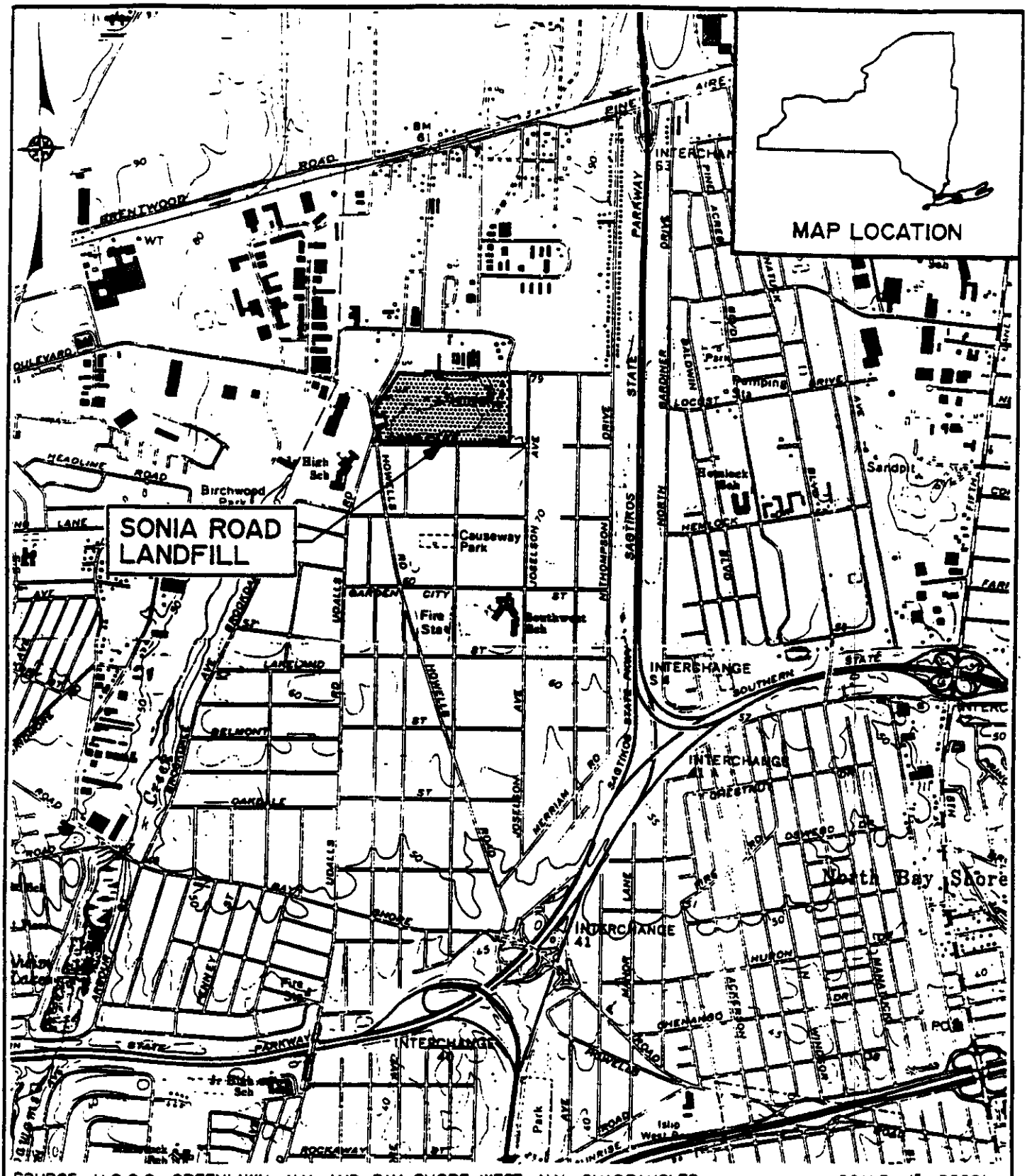
The monitoring program, which will monitor groundwater and landfill gas, will be developed in accordance with 6 NYCRR Part 360 regulations.

The estimated present worth cost to implement the remedy is $12,400,000. The cost to construct the remedy is estimated to be $11,050,000 and the estimated average annual operation and maintenance cost for 30 years is $115,000.

SECTION 8: HIGHLIGHTS OF COMMUNITY PARTICIPATION

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

- A site-specific Citizen Participation Plan (CPP) was reviewed and approved by the Department.
- A local repository for documents pertaining to the site was established.
- A site mailing list was established which included nearby property owners; local political officials at various levels; local media; civic, environmental and economic groups; school and water district authorities; and other interested parties.
- A public informational meeting was held in March 1997 to present the Remedial Investigation/ Feasibility Study (RI/FS) Work Plan.
- A second public meeting was held in March 1998 to present findings of the Remedial Investigation.
- In May 1998, the Proposed Remedial Action Plan (PRAP) was issued. As mandated by 6NYCRR Part 375, a minimum thirty-day comment period was held for the PRAP from May 11 to June 11, 1998. On May 20, a third public informational meeting was held to present and receive comment on the PRAP.
- In July 1998, a Responsiveness Summary was prepared and made available to the public, to address the comments received during the public comment period for the PRAP.



SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

SITE LOCATION MAP

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

FIGURE 1

MW-12			
COMPOUND	S	I	D
NO EXCEEDANCES			

MW-11			
COMPOUND	S	I	D
1,2 DCE	24/16	-/-	-/-
TCE	12/6.5	-/-	-/-
1,1 DCA	-/7.2	7/-	-/-

MW-01			
COMPOUND	S	I	D
1,1 DCE	-/-	-/-	-/15
1,1 DCA	8/12	14/13	13/22
1,1,1 TCA	-/-	22/5.1	66/170
CT	-/-	-/-	-/20

MW-10			
COMPOUND	S	I	D
1,1 DCA	24/-	11/-	8/-
4M, 2P	-/-	-/-	-/6.5

MW-03			
COMPOUND	S	I	D
1,1 DCE	-/-	-/-	9/-
1,1 DCA	-/-	46/36	10/-
1,1,1 TCA	-/-	16/9.8	61/18

MW-05			
COMPOUND	S	I	D
CA	9/5.1	-/-	-/-

MW-14			
COMPOUND	S	I	D
VC	-/-	-/-	14/-
1,2 DCE	-/-	-/-	21/-
CA	-/-	8/6.9	-/-

MW-02			
COMPOUND	S	I	D
NO EXCEEDANCES			

MW-07			
COMPOUND	S	I	D
VC	-/-	-/-	-/7.7
1,2 DCE	-/-	-/-	12/140
TCE	-/-	-/-	-/50
PCE	-/-	-/-	21/270

MW-06			
COMPOUND	S	I	D
VC	-/-	-/-	19/19
1,2 DCE	-/-	-/-	480/360
TCE	-/-	-/-	45/36
PCE	-/-	-/-	1,200/1,600
1,1,1 TCA	-/-	7/-	23/17
BENZENE	-/4.1	-/-	-/-
CHLOROBENZENE	-/6.2	-/-	-/-

MW-04			
COMPOUND	S	I	D
1,2 DCE	-/-	-/-	7/-
CA	8/7.2	20/8.6	11/27

MW-13			
COMPOUND	S	I	D
VC	-/-	7/4.7	2/-
1,2 DCE	-/-	73/53	31/34
PCE	-/-	9/11	-/-
BENZENE	-/-	-/-	-/2.7

MW-11D, MW-11S, MW-11I, MW-12D, MW-12S, MW-12I, MW-02S, MW-02I, MW-02D, MW-07S, MW-07I, MW-07D, MW-01I, MW-01S, MW-01D, MW-10S, MW-10I, MW-10D, MW-06S, MW-06I, MW-06D, MW-04D, MW-04I, MW-03D, MW-03S, MW-05I, MW-05D, MW-05S, MW-03I, MW-14I, MW-14D, MW-14S, MW-13D, MW-13S, MW-13I

SOUTH 4th STREET; CORBIN AVENUE; SONIA ROAD; DEER PARK STREET; BRENTWOOD STREET; UDALL ROAD; HOWELL'S ROAD; FAIRBANKS AVENUE; AVENUE; MARTINSTEIN AVENUE; JOSELSON AVENUE; NUGENT AVENUE; NORTH THOMPSON ROAD

LEGEND

VC	VINYL CHLORIDE
1,1 DCE	1,1 DICHLOROETHENE
1,2 DCE	1,2 DICHLOROETHENE
TCE	TRICHLOROETHENE
PCE	TETRACHLOROETHENE
1,1 DCA	1,1 DICHLOROETHANE
1,1,1 TCA	1,1,1 TRICHLOROETHANE
CA	CHLOROETHANE
CT	CARBON TETRACHLORIDE
4M,2P	4-METHYL, 2-PENTNONE
S	SHALLOW
I	INTERMEDIATE
D	DEEP
-	RESULT DOES NOT EXCEED STANDARDS
8/16	1st. ROUND/2nd. ROUND

NOTE:
ALL CONCENTRATIONS IN ug/l

0 600
SCALE IN FEET

DIR: 1445 FILE: 1445-37 LVO/2/25/98

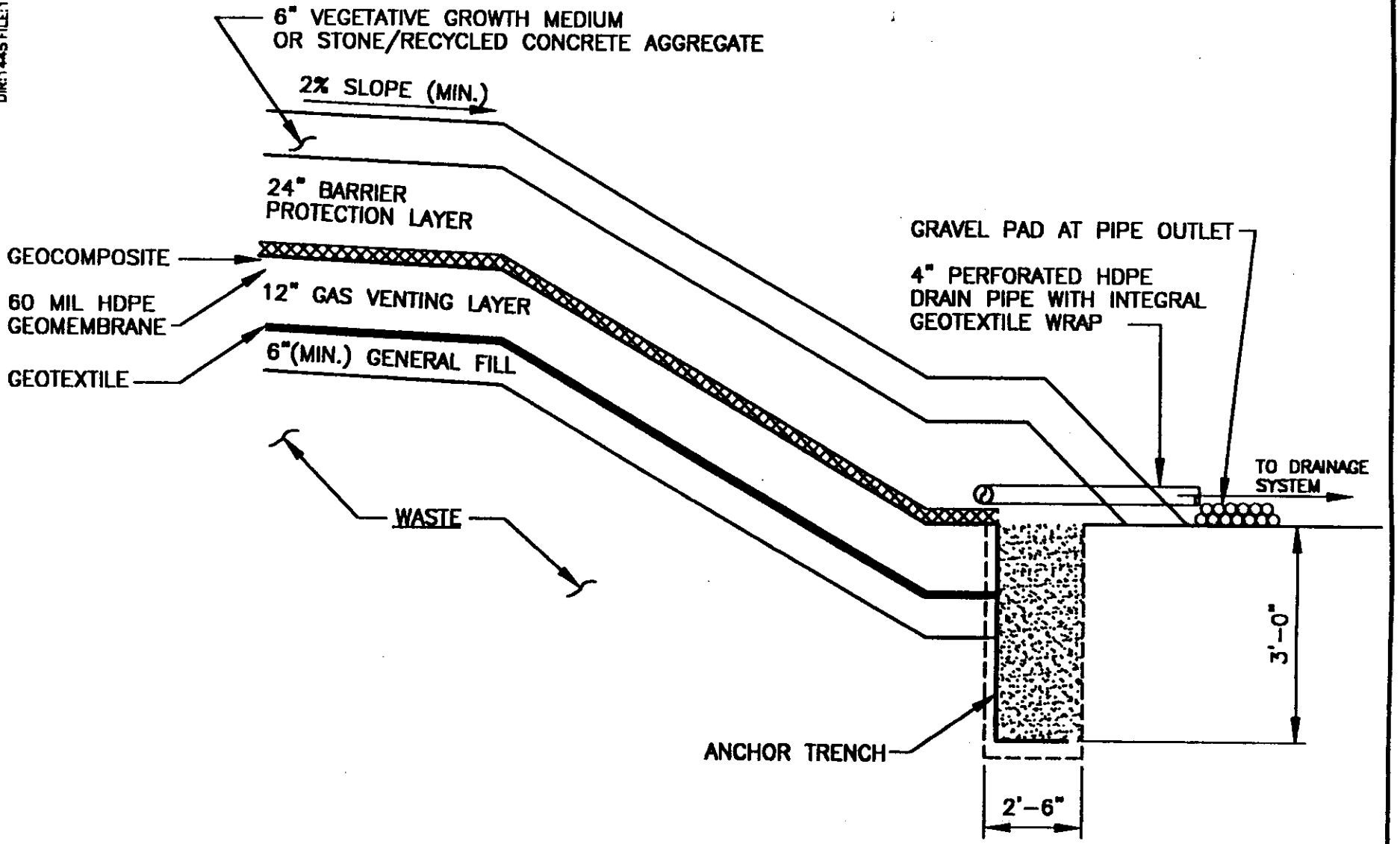
SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

CONCENTRATIONS OF VOLATILE ORGANIC COMPOUNDS EXCEEDING GROUNDWATER STANDARDS IN MONITORING WELLS

FIGURE 2

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

DIR:1445 FILE:1445-38



SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

CAP CROSS-SECTION

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

FIGURE 3

Table 1

SONIA ROAD LANDFILL
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
SURFACE SOIL RESULTS EXCEEDING SOIL CLEANUP OBJECTIVES

Constituent	NYSDEC Soil Cleanup Objectives	SS-01 Off-Site	SS-02 Off-Site	SS-03 Off-Site	SS-04 On-Site	SS-05 On-Site	SS-06 On-Site	SS-07 On-Site
Semivolatile Organics (units in ug/kg)								
Bis(2-ethylhexyl)phthalate	50000	**78000**	140 B	140 B	1100 B	ND	130 B	360 B
Benzo(a)pyrene	61	ND	**62**	**140**	**120**	ND	**150**	**100**
Dibenzo(a,h)anthracene	14	ND	ND	**45**	**41**	ND	**29**	ND
Metals (units in mg/kg)								
Arsenic	7.5	7.5	3.3	3.9	3.4	2.4	2.2	1.5 B
Beryllium	0.16	**0.23 B**	**0.29 B**	ND	**0.29**	ND	ND	ND
Copper	25	**25.7**	8.5	10.6	7	8.9	9.4	15.6
Iron	2000	**8840**	**7620**	**9110**	**9620**	**6390**	**6380**	**5040**
Mercury	0.10	**0.31**	ND	ND	ND	ND	ND	ND
Zinc	20	**116**	**48.9**	**62.4**	**39.4**	**31.8**	**44.8**	**101**

Notes:

Concentrations in bold were detected above NYSDEC Soil Cleanup Objectives.
ND: Not detected.
B: Concentrations above instrument detection limit but below contract required detection limit.

Table 2
Nature and Extent of Contamination

MEDIA	CLASS	CONTAMINANT OF CONCERN	CONCENTRATION RANGE (ppm)	FREQUENCY of EXCEEDING SCGs	SCG (ppm)
Groundwater	Volatile Organic Compounds (VOCs)	**Tetrachloroethene**	ND to 1.6	6 of 72	0.005
		1,2 Dichloroethene	ND to 0.480	11 of 72	0.005
		1,1,1-Trichloroethane	ND to 0.170	11 of 72	0.005
		Trichloroethene	ND to 0.050	5 of 72	0.005
		1,1 Dichloroethane	ND to 0.046	14 of 72	0.005
	Leachate Parameters	**Ammonia**	0.02 to 9.3	8 of 36	2
		Iron	33 to 66,000	27 of 36	0.3
		Manganese	6 to 36,100	21 of 36	0.3

Table 3
Remedial Alternative Costs

Remedial Alternative	Capital Cost	Annual O&M	Total Present Worth
No Action	$0	$450,000	$450,000
Shallow and Deep Groundwater Treatment, Landfill Gas Control, and Capping	$14,300,000	$400,000	$18,600,000
Shallow Groundwater Treatment, Landfill Gas Control, and Capping	$13,950,000	$400,000	$18,250,000
Landfill Gas Control and Capping	$11,050,000	$115,000	$12,400,000
Capping	$10,050,000	$115,000	$10,950,000

APPENDIX A

RESPONSIVENESS SUMMARY

Sonia Road Landfill
Proposed Remedial Action Plan
Town of Islip, Suffolk County
Site No. 152013

The Proposed Remedial Action Plan (PRAP) for the Sonia Road Landfill was prepared by the New York State Department of Environmental Conservation (NYSDEC) and issued to the local document repository on May 11, 1998. This Plan outlined the preferred remedial measure proposed for the Sonia Road Landfill. The preferred remedy is a combination of a final landfill cover (cap), landfill gas migration control, and long-term monitoring of groundwater.

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

A public meeting was held on May 20, 1998 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. This Responsiveness Summary records comments received at this meeting for inclusion in the Administrative Record for this site. Written comments were received from two individuals who attended the public meeting; their comment letters are included in the Administrative Record (see Index in Appendix B).

The public comment period for the PRAP officially closed on June 11, 1998. This Responsiveness Summary responds to all questions and comments raised at the May 20, 1998 public meeting and to the written comments received.

The following are the comments received at the public meeting, with the NYSDEC's responses:

COMMENT 1: Will the landfill cap extend over whole site?

RESPONSE 1: Yes - all 42 acres of the municipal waste.

COMMENT 2: Will final zoning be industrial? Is this compatible with the landfill cap?

RESPONSE 2: The site is zoned Industrial - "I1", and "I2"- suitable for outdoor equipment storage. The Town of Islip is reviewing an application to install a mobile phone transmission tower on the site also. Deed restrictions will not allow any activities which might damage the cap, and will require the approval of NYSDEC for any proposed new uses.

COMMENT 3: Will these deed restrictions only apply to the landfill property or to other properties as well?

RESPONSE 3: The deed restrictions can only apply to the Sonia Road Landfill property.

COMMENT 4: Why were no monitoring wells installed southwest of the site? There are private wells in that direction. You assume regional groundwater flow patterns apply, but the RI should have verified this true for this site.

RESPONSE 4: The data obtained from wells surrounding the site clearly show a south-southeasterly plume of landfill-related contamination, based on leachate indicators such as conductivity and alkalinity. This plume moves with the regional flow of groundwater toward the Great South Bay. A groundwater table mound can be created within a landfill, causing radial flow (flow in all directions away from the mound). Radial flow effects, however, would only be noticed in very close proximity (within a few hundred feet), and would not reach the homes with private wells to the southwest. The Sonia Road Landfill, furthermore, is not a large topographic mound and the groundwater table is relatively high. These factors diminish the water table mounding and the radial effect on groundwater flow from this site. Therefore, the regional flow pattern dominates in the off-site area of concern, including residential neighborhoods.

COMMENT 5: Surface drainage into Sampawams Creek from Corbin Avenue is a serious problem.

RESPONSE 5: The drainage into Sampawams Creek from Corbin Avenue comes from many sources in addition to the landfill. Because of its mostly flat topography, the landfill does not now greatly contribute to area-wide drainage into the Creek. Regardless, one of the major functions of the landfill cap will be to control and direct surface drainage. A properly designed and maintained cap will protect surface runoff from contact with wastes and minimize off-site drainage.

COMMENT 6: The selected remedy is not truly a "remedy". Wastes are not permanently destroyed.

RESPONSE 6: NYSDEC recognizes the cap is not a permanent treatment, but also that capping is the only feasible and the most protective way to address a large quantity of municipal waste that contains some hazardous waste. It should be kept in mind that any type of removal or treatment of this volume of waste could actually cause more environmental problems.

COMMENT 7: Are the contaminants in MW-11 caused by nearby industries?

RESPONSE 7: Yes. MW-11 results, especially for volatile organic compounds such as trichloroethylene, illustrate the impacts to groundwater from industrial sources upgradient (upstream in terms of groundwater flow) of the landfill.

COMMENT 8: The remedy is not a complete containment. You do not address groundwater already contaminated from plume in the past.

RESPONSE 8: While the remedy will prevent future impact to groundwater quality from the landfill, it does not actively address past contamination. As explained in the Feasibility Study, the landfill contaminants - primarily iron, manganese and ammonia - can be expected to naturally dissipate or degrade

before reaching any public or private wells or surface water. In any event, everyone in the plume area receives public water.

COMMENT 9: Industry should be held responsible for contaminant plumes also, not just sources. Plumes are the real problem.

RESPONSE 9: This point is well taken. NYSDEC, however, must consider due process and determining who is responsible when there are multiple sources impacting groundwater. The Town of Islip cannot be required to take care of a plume caused by others (namely, the VOC plume). NYSDEC must enforce cleanup source by source or if possible, get multiple polluters to work out cooperative agreements to address plumes with multiple sources. In a feasibility study, plume cleanup is always considered as well as actions to clean up the source.

Commentors are encouraged to keep in contact with NYSDEC regarding future actions for industrial sources north of the landfill. A plume investigation is planned for this year. Contact Mr. Daniel Eaton, Bureau of Hazardous Site Control, NYSDEC-DER, for more information (address: 50 Wolf Road, Albany, NY 12233-7010 or call toll-free (800) 342-9296).

COMMENT 10: The cost difference ($8 million) between Alternative 2, which includes groundwater treatment, and 4 (the state's preferred alternative) is not that large - and $18 million for Alternative 2 is comparable to a school budget. Why not spend the extra $8 million to "do it right?"

RESPONSE 10: While these costs might not seem significant next to a Long Island school budget, they represent a significant percentage increase when comparing one alternative to another, versus the environmental and health benefits derived from that increased expenditure. NYSDEC must always consider the benefit from these limited monies, and the majority of the cost of the groundwater treatment alternatives would go toward removing iron and manganese - low-hazard contaminants - from groundwater.

COMMENT 11: You are influenced by location of site (NYSDEC shows favoritism toward certain communities).

RESPONSE 11: The record of NYSDEC's remedy choices throughout the state shows that remedies are developed and selected based on the hazards presented by the site and the potential for harm to communities. Objective factors are considered, not favoritism.

COMMENT 12: Was the private property that extends onto the landfill site investigated? The Town should condemn this property!

RESPONSE 12: The Town of Islip has been in contact with the property owner not about condemnation, but to keep the residents informed of progress of the landfill remedial program. The family receives public water, and the Town measured soil gas on their perimeter. The landfill cap and gas control system will be designed to be protective of this family.

COMMENT 13: In regard to the Town using "clean fill" (alternative grading materials to contour the landfill before capping), what is "clean fill"? How will these materials be screened and tested?

RESPONSE 13: "Clean fill" refers to uncontaminated soil or alternative materials such as stone, brick, or any demolition material that will not decompose and cause odors or excessive settlement. The Town must submit a written plan for use of any fill materials to NYSDEC for review. Minimum practices the NYSDEC will require will include a full-time monitor on the site during filling, documentation of the source of fill, and chemical screening and testing.

COMMENT 14: The State Superfund may run out by the year 2000. If this happens, how will the Town of Islip fund the remedy?

RESPONSE 14: The Town of Islip Engineer responded that the Town is making every effort to complete the project before that time. An aggressive design and construction schedule has been proposed to NYSDEC. The Town of Islip is under an Order on Consent to complete the site remedy regardless of the availability of State monies; if the Superfund were to run out, the Town would be obligated to raise money from other sources.

COMMENT 15: Are heavy metals such as arsenic associated with the landfill? What are the environmental and health impacts from these metals?

RESPONSE 15: The Remedial Investigation reports the more toxic heavy metals such as arsenic, lead, mercury and cadmium have not been detected at most well locations. Where detected, levels are below method detection limits and/or within limits of state groundwater quality and drinking water standards. Iron, manganese and sodium, in contrast, exceed groundwater standards at various locations, especially in the landfill plume zone. Standards for iron and manganese are based on taste, odor and the potential for laundry staining, pipe scaling and other nuisances. Sodium standards are based on dietary recommendations. All are naturally occurring in Long Island aquifers, though landfill leachate can cause them to be dissolved and move in groundwater as a plume.

COMMENT 16: Private wells on King Street (southwest of the landfill) have been impacted by high levels of manganese. This could have resulted from southwesterly plume movement from the landfill.

RESPONSE 16: The landfill is an unlikely source for the manganese in this area, since as explained in the response to Comment 4, regional groundwater flow carries the landfill plume to the southeast.

COMMENT 17: Public water supply wells have been shut down in the past due to landfill contamination.

RESPONSE 17: No area public wells have been shut down due to the landfill. Historically, a few wells have been shut down because of other problems, such as cesspool contaminants from surrounding houses and businesses.

COMMENT 18: NYSDEC has known about these plumes for a long time; why hasn't something been done sooner?

RESPONSE 18: As previously discussed, one reason the cleanup process is so time-consuming is the need to identify sources and compel responsible parties to perform source cleanups. The technical complexity of these plumes, and any potential solutions, add to the time needed to develop effective remedies. Plumes which present a more immediate health threat are dealt with quickly using State or federal Superfund monies.

Written Comments Received from Elsa Ford, June 11, 1998:

Remedial Investigation has not investigated the full extent of the plumes from the Sonia Landfill. This site was used for dumping since 1965 beginning with junked cars. NYSDEC reports site known to have received Hooker Chemical Company waste including vinyl chloride. Vinyl chloride found three-quarters of a mile south in 1982, but the full extent of that plume not plotted at that time or since to the point of zero. In 33 years the original Sonia plume has continued to move probably to the bay. While there might be some contaminant breakdown in movement, considerable VOCs persisted in the Servall plume just east of Sonia and could here. Heavy metals would be more likely to persist. Since the 1970s Islip Town's clam harvests have sharply fallen. The Sonia plume could be part of that problem, and if allowed to continue could well impact the Towns plans to reseed the bay with clams from the fish hatchery. Effect on clams could be early warning that canaries in the mines present for signs of human exposure to those swimming in the bay, etc. (Enclosed Newsday and Suffolk Life articles)

The Sonia contribution to the deep contamination plume cannot be ruled out, since it is an old site open to rainfall with refuse 35 feet deep. There need to be monitoring wells southwest of the landfill to determine specific water directions at the site rather than rely on estimates. This site borders on Long Island Hydrogeologic Zone I so that water can flow in more than one direction. A Suffolk County Water Authority report notes that the clay is not continuous; water may move around lenses, and that buried underground valleys allow the water to laterally enter the Magothy directly from glacial deposits (see enclosed report). More needs to be known of surface and groundwater connections. Depending on the time of year and rainfall, the water table can be at 7 feet or higher. People say Lake Street to the west often floods. The 1979 Phase I Sorenson Report notes that the surface water flows southwest except close to the Sampawams Creek where the land slopes creekward. Surface water drainage trends generally southwest toward the creek (report pages enclosed). Since the creek is not full all year water direction changes are indicated - this has implications for people with private wells in the area (King Street), the Sampawams Creek and the Guggenheim Lakes. Since the three homes on King Street have only recently been discovered, there may be other homes with private wells in the plume paths. Note that the King Street contamination is similar to Sonia contamination. At the public meeting background levels of iron and manganese were said to be high, but that was not the case in the 1971 Suffolk County Water Authority report (enclosed p. 25). There are also public wells in the plume paths that cold be affected by drawing in contaminated water.

Community people reported cesspool truck dumping in Sonia. What tests for infectious organisms have been done?

The study has shown upgradient sources that need to be addressed, many of which are likely contributors of contamination to the plume. The NYSDEC has known about these problems for many years, but the plume continues. Addressing possible sources one at a time will only result in a circle of finger-pointing

with little remedy in sight. We must have a whole community environmental quality approach that deals with all of the matters together as in the New Cassel Industrial Area. It will take serious commitment of the NYSDEC, the NYS Department of Health, the United States Environmental Protection Agency, NYS Department of Law, Town of Islip and the people of the community working together to protect the health of the people in this long-impacted community.

RESPONSE: Refer to responses to previous comments. It is indeed likely that the landfill, over its period of operation (1965 - 1977) has released contamination to the aquifer that is not visible now, but has impacted the quality of groundwater. The feasible approach at the present time is to address the source (by capping the landfill) to prevent future contamination, and address potential users of groundwater at the points of use (through routine sampling of public supply wells, surveys and monitoring of private wells as appropriate). The RI did not include testing for organisms associated with septic waste because the hazardous waste remediation program focuses primarily on chemical contamination. These organisms are typically filtered out by movement of groundwater a sufficient distance through the soil and sand of an aquifer.

The flow direction of groundwater can reliably stated to be southeastward in the environs of the landfill. The hydrogeologic zone boundary mentioned lies approximately 3000 feet north of the landfill, and in any case is not a divide (where groundwater can flow in different directions) but a representation of how the aquifer is receiving or discharging water.

The more pressing environmental problem clearly is the VOC plume (or plumes) emanating from source(s) north of the landfill. People concerned about groundwater quality in the area are encouraged to keep in contact with NYSDEC regarding investigation and remedial action for this industrial area. It is true that for an effective plume cleanup, the Department must coordinate investigations of individual sources and keep in mind the whole area in any enforcement or remedial strategy.

Written Comments of John McHugh, June 10, 1998:

I am writing to object to the Proposed Remedial Action Plan at the Sonia Road Landfill Site, Islip, NY. Fact Sheet enclosed from May 20, 1998 Meeting ID No. 152013. Also enclosed is the report of groundwater sampling from August 1994.

I am also including parts of Dvirka and Bartilucci's report pages 3-23 and 3-24. Figure 3-1 and 4-3 speak for themselves. MW-8 well in the report is missing from 4-3. Also included is a hydrology report from the 1960s. Groundwater flow could parallel Sampawams Creek where there are a number of Suffolk County Water wells. One well field, the Harvest Lane well field, recently had carbon filters installed at a cost of millions of dollars to taxpayers.

Alternative 4 is not acceptable. Groundwater must be treated; our children and grandchildren must be protected.

RESPONSE: The Proposed Remedial Action Plan weighs the benefit, cost and feasibility of groundwater collection and treatment for Sonia Road Landfill. In view of the contaminants specific to the landfill, collection and treatment of groundwater would do little to protect public health or the environment. The State and County Departments of Health have determined that the selected remedy is

protective of public health including children. An effective remedy for the VOC contamination must focus on the sources north of the landfill. According to the Remedial Investigation Report, monitoring well cluster MW-8 was never installed because analysis of groundwater quality in the proposed location (the southwest corner of the landfill) showed very little contamination (see page 2-21).