File 4940

Department of Environmental Conservation

Division of Hazardous Waste Remediation

Whitestown Municipal Landfill
Oneida County, New York

Site Number 633013

Record of Decision

August 1992

Funded Under Title 3
of the
1986 Environmental Quality Bond Act

New York State Department of Environmental Conservation
MARIO M. CUOMO, *Governor* THOMAS C. JORLING, *Commissioner*

RECORD OF DECISION

WHITESTOWN MUNICIPAL LANDFILL

ONEIDA COUNTY, NEW YORK

ID NUMBER 633013

PREPARED BY

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DIVISION OF HAZARDOUS WASTE REMEDIATION

AUGUST 1992

FUNDED UNDER TITLE 3 OF THE

1986 ENVIRONMENTAL QUALITY BOND ACT

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Whitestown Municipal Landfill
Town of Whitestown
Oneida County, New York
Site Code: 6-33-013
Funding Source: 1986 Environmental Quality Bond Act

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Whitestown Landfill site. The selection was made in accordance with the New York State Environmental Conservation Law (ECL), and is consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). This decision document summarizes the factual and legal basis for selecting the remedy for this site.

Appendix 1 identifies the documents that comprise the Administrative Record for the site. The documents in the Administrative Record are the basis for the selected remedial action.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action described in this Record of Decision (ROD), present a current or potential threat to public health, welfare and the environment.

DESCRIPTION OF THE SELECTED REMEDY

Major components of the selected remedy include the following:

1. Excavation of refuse from southern portions of the landfill property to consolidate into the main landfill mass, with reclamation of the excavated areas.

2. Excavation and regrading of the main landfill mass to achieve slopes compliant with 6 NYCRR Part 360 and conducive to long-term slope stability.

3. Stabilization of the bluff face north of the landfill to prevent erosion or slope failure from causing damage to the final cover or drainage structures.

4. Construction of an engineered multimedia final landfill cover over the main waste mass, including stockpiled petroleum-contaminated soils in the southeast area of the landfill. The cover will include a passive vent system for landfill gas. If post-construction monitoring shows gas emissions present an unacceptable health risk, the vent system will be converted to an active one.

5. Construction of a surface water diversion system sufficient to protect the final cover and the bluff from excessive erosion. Runoff will be diverted down Shacksbury Road on the west side of the site and down the bluff face on the east side, at the site of the former gabion wall into the Old Erie Canal.

6. Institutional controls to prevent use of groundwater or future development of property onsite and vacant properties downgradient of the site between the bluff and the Old Erie Canal shall be implemented by the Town of Whitestown.

7. Installation of a subsurface collection system to intercept shallow groundwater in the plume area, including the P2 property. Collected groundwater will be treated on-site to SDPES discharge standards and discharged to the Old Erie Canal, or transported to a publically-owned treatment works (POTW).

8. While the subsurface collection system over time is also expected to eliminate exposure to contamination in the basement of the P1 residence, measures must be implemented at the P1 residence to ensure the elimination of any current exposure.

9. Where feasible, removal of the soils at the bluff base contaminated by leachate outbreaks; replacement of the soils with material which will contain or divert leachate from breaking out at ground surface.

10. Environmental monitoring to determine the effectiveness of the remedial program. Groundwater, surface water, sediment, and vent gases will all be subjected to a periodic monitoring program designed to detect any changes in the effectiveness of the remedial program.

Costs for the final cover and surface water drainage system have already been incurred since these are presently under construction. The total estimated cost for the remedy described above ranges from $10,478,000 and $13,498,000, dependent upon optimization of groundwater collection and treatment. This estimate includes capital costs ranging from $7,761,000 to $8,966,000, depending upon optimization of collection system design, and is based upon operation, maintenance and monitoring for the required minimum 30 year post-remediation monitoring period. Capital costs are based upon actual design expenditures to date and a lowest bid for construction of the final cover, and engineering estimates based upon conceptual designs of the bluff stability measures and a groundwater collection trench.

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. Waivers are justified for applicable or relevant and appropriate requirements that will not be met. This remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable. However, because treatment of the principal threats of this site was not found to be justifiable at this time, this remedy does not satisfy the preference for treatment as a principal element.

Because this remedy does not provide for unlimited use of the site within five years after commencement of remedial action, a five year review will be conducted. This evaluation will be conducted within five years after the commencement of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

8/28/92
Date

Ann DeBarbieri
Deputy Commissioner
Office of Environmental Remediation
New York State Department of
Environmental Conservation

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SITE #633013

I. SITE LOCATION AND DESCRIPTION

The Whitestown Municipal Landfill site is located in the Town of Whitestown on Shacksbury Road, Oneida County, New York. The site is situated on a bluff approximately one hundred feet above State Route 69, which bounds the site on the northeast. To the north of Route 69 are an abandoned portion of the Old Erie Canal, NYSDEC- regulated wetlands, and about a quarter mile from the site, the Mohawk River. To the east there is a cultivated field. To the south is an undeveloped wooded area extending about one mile to Woods Road and private residences. Across Shacksbury Road to the west is the N.A. Walbran Elementary School. Private residences are found on Shacksbury Road and along Route 69 at the base of the bluff. Figure 1 shows the location of the site with respect to the local area.

Approximately 30 out of the 50 acres on the landfill property have been used for waste disposal. All residences in the vicinity of the site are connected to a public water supply; there are no private or commercial water supply wells near the site.

II. SITE HISTORY

The Whitestown Landfill operated from 1967 to January 1991, receiving predominantly municipal wastes. In the early 1980's, petroleum contaminated soils were disposed of at the site from storage tank excavations. The soils were stockpiled in a southeast extension of the landfill known as the "dogleg". Questionnaires returned to NYSDEC under the Community Right-to-Know Law by local industries indicated that degreaser still bottoms containing trichlorethylene, spent case-hardening salt mixtures containing cyanide, and waste polyurethane resin containing perchloroethylene, all hazardous wastes as defined under State regulation, were also disposed of in the landfill. Waste pesticides from Bonide Chemical Company were suspected of being brought to the site, but to date, DEC investigation has not yet revealed any evidence that other than "empty bags" from Bonide were landfilled at Whitestown.

In 1980 and 1985 Dunn Geoscience Corporation, under contract to NYSDEC, conducted investigations of groundwater quality at the site. The 1985 investigation concluded that the landfill was impacting groundwater quality and recommended a Remedial Investigation/ Feasibility Study (RI/FS) be conducted.

In 1987 the NYSDEC and the New York State Department of Health (NYSDOH) began to receive complaints from owners of two residences at

the base of the bluff on the south side of Route 69. The homeowners indicated that leachate was seeping into the basements of their homes. The NYSDOH sampled the leachate seeps and the Town of Whitestown took air samples in each home. These sampling events' results showed no immediate or acute threat to the residents, but at the same time did not rule out the possibility of a long-term threat. The seepages have, moreover, created a nuisance condition and caused loss of use of the basements. The Town eventually purchased one of the residences, and the other residence, designated "P1", is being addressed in this Record of Decision (ROD). On the basis of the residence seepages and the results of the 1985 Dunn Geoscience investigation, the NYSDEC assigned the landfill a priority status of "Class 2" on the NYS Registry of Inactive Hazardous Waste Sites, determining that the site posed a "significant threat to human health and/or the environment" with "action required". Due to this determination, the NYSDEC did not allow the Town to renew its permit to operate the landfill.

Negotiations began in 1987 on an Order on Consent which would allow the Town to continue to operate the landfill while seeking another municipal waste disposal alternative, provided the Town initiated a Remedial Program. By entering into this Order, the Town also became eligible to receive partial State funding (up to 75 percent) of the costs of the Remedial Program through the 1986 Environmental Quality Bond Act, Title 3.

As the first stage of the Remedial Program for the Whitestown Landfill site, the Town of Whitestown has conducted an RI/FS in accordance with the United States Environmental Protection Agency (USEPA) October 1988 Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA and a work plan approved by NYSDEC in July 1989. A phased approach was adopted for this RI/FS, Phase I of the RI taking place in the fall of 1989 and Phase II in the fall of 1990, followed by the FS in the fall of 1991. Reports generated from these investigations are listed in the Administrative Record Index (Appendix 1) and should be referred to for detailed information.

III. REMEDIAL INVESTIGATION FINDINGS

The significant findings of the Remedial Investigation are summarized below:

The landfill is underlain by cemented sands and gravels which increase in silt content and decrease in hydraulic conductivity with depth. The water table was encountered 120 to 140 feet below landfill surface, but at the base of the bluff is within 5 to 10 feet of ground surface. At a depth of about forty feet below the water table, a layer of clayey silt designated the "glaciolacustrine unit" in the RI Report is encountered. This unit is believed to extend throughout the site area and with its low permeability acts as a aquitard, mostly barring migration of groundwater to lower depths. In addition, glacial till, which also acts as an aquitard, was found to the west of the site and beneath the glaciolacustrine unit along the base of the bluff. Bedrock

was not encountered in the RI but is believed to lie about 200 feet below the base of the bluff and consist mostly of shale. The bedrock is used as a drinking water aquifer elsewhere in Oneida County but not in the vicinity of the landfill. The direction of groundwater flow is generally northeast toward the Mohawk River, although a northwest component of flow is found on the west side of the site (refer to Figure 2, a water table surface map).

Environmental sampling during the RI revealed a pattern of groundwater contamination shown on Figure 3. This contamination is principally by organic compounds, especially the ketones, which are found in total concentrations of up to 3000 parts per billion (ppb) in Monitoring Well H109, screened in the water table directly under the landfill waste, and up to 1,100 ppb in Well H105S at the toe of the bluff. Figure 4 shows the locations of these wells and other sample locations. Chlorinated hydrocarbon compounds were found in total concentrations of up to 3800 ppb in Well H109 while the maximum total concentration at the bluff base was 135 ppb in Well H111, also screened at the water table. Lesser quantities of toluene and phenols appeared in these and other downgradient wells. Organic contamination generally was noted only in the upper 15 feet of the aquifer. Concentrations of metals (principally iron, chromium, nickel, manganese, zinc, arsenic, and lead) exceeded NYS Groundwater Standards in various locations. In contrast to the organic compound data, the metals data do not form a clear pattern of contamination, though they do appear to be elevated in groundwater seeps. The seep in the basement of Residence P1 showed elevated ketones, toluene, and arsenic.

In April 1992, subsequent to the RI/FS and the State's Proposed Remedial Action Plan (PRAP), another groundwater seep was discovered in the yard of a residential property (P2) west of the plume area. The P2 seep was sampled and found similar to the P1 sample and other plume area samples, i.e. to contain ketones, toluene, and phenol, and therefore is considered impacted by the landfill. In addition, leachate outbreaks into the wetland were significantly more extensive than previously observed. Leachate containing elevated arsenic, iron, and manganese was observed in April 1992 seeping into the wetland over an area approximately 500 feet wide by 6 feet deep. This information significantly changes the basic feature of the groundwater alternative portion of the proposed remedy from that of limited action with a Contingency Action Plan to that of implementing the groundwater action plan.

Anomalous elevated detections of arsenic (up to 386 ppb in surface water, 17.6 parts per million (ppm) in sediment) and lead (1260 ppb in surface water, 92 ppm in sediment) were noted during the RI in the Old Erie Canal at groundwater seep locations. Arsenic was found in groundwater up to 34.7 ppb and in the P1 residential seep at 50.4 ppb. Canal sample location 305 in particular, described in the RI as a visible leachate seep, contained the highest detections of arsenic, iron, and manganese in surface water. Iron was found in this sample at 410,000 ppb in surface water and on average at 4900 ppb in groundwater.

Manganese was noted at 16,800 ppb in surface water and up to 1310 ppb in groundwater at the bluff base. These metals also appeared at high concentrations in the groundwater seep at the P1 residence. Elevated detections of polycyclic aromatic hydrocarbon (PAH) compounds were noted in Canal sediments, but were not found in soil or groundwater at H109, H105S, or H111, monitoring wells most obviously impacted by landfill leachate. Through surface discharge, evaporative concentration, and precipitation onto sediment, landfill-contaminated groundwater may have contributed to elevated concentrations of metals noted in the Canal. The PAH results, however, may arise from another source of contamination, such as road runoff.

The analyses for pesticides and polychlorinated biphenyl compounds (PCBs) showed no detections of these parameters in any medium, including at the residential seeps P1 and P2.

An extensive program of soil gas sampling was performed in the RI. Several aromatic and chlorinated hydrocarbon compounds were detected in the soil gas samples taken within the landfill mass. Air sampling will be necessary following implementation of the site remedy to confirm that NYSDEC Ambient Guideline Concentrations for air quality are not exceeded off-site due to the emission of these compounds in vented landfill gas.

IV. ASSESSMENT OF SITE RISKS

A Habitat Based Assessment of the quality of ecological resources around the site was performed to aid in determining impacts on these resources from the site. The Assessment determined that the wetlands north of the Old Erie Canal provide a very good quality habitat for a variety of species, including three endangered or threatened plants. The Assessment did not include a survey of aquatic biota but noted that aquatic biota may be adversely affected by concentrations of iron, manganese, arsenic, lead, and zinc in Canal sediments which exceed effect levels under NYSDEC sediment guidance criteria, and Canal surface water concentrations of these and other metals exceeding NYS standards for protection of aquatic life. As previously discussed, metals concentrations in the sediments and surface water appear to be derived from landfill-impacted groundwater seeps. Further study, including biological sampling and further chemical sampling would be necessary to determine the extent to which biota are actually affected, whereas the data presently available indicate a risk to biota in the Canal and potentially the wetlands.

A Baseline Risk Assessment performed in accordance with USEPA's Risk Assessment Guidance for Superfund (1989), quantifying health risks to humans from site media, was also performed. Based upon available information concerning the health effects of site contaminants, this assessment found no significant risks to exist through any current routes of exposure to residents or passers-by (principally skin contact, accidental ingestion, and inhalation of contaminants found in

groundwater seeps) but determined that health risks unacceptable under CERCLA would be incurred in a hypothetical scenario where a resident immediately downgradient of the site installed a supply well and used groundwater for bathing, cooking and drinking. Although the P2 seep was not considered in the Baseline Risk Assessment, it may be inferred that risk calculations there would show similar or lower results than other downgradient locations, based on the composition of the P2 seep and the assumptions used in the Risk Assessment. Notwithstanding the risk assessment results, the groundwater seeps at the P1 residence, the P2 residence yard, and along Route 69 present an uncontrolled and ongoing exposure to landfill contamination.

V. ENFORCEMENT HISTORY

Orders on Consent

The following Orders on Consent were executed by the Town of Whitestown and the NYSDEC:

Date	Index No.	Subject of Order
November 29, 1988	A6-0140-88-02	Cessation of landfilling by September 1990; Implementation of a Remedial Program
October 10, 1990	A6-0241-90-08	Extension of landfill operation until January 1991; Early design and construction of final cover

VI. GOALS FOR REMEDIAL ACTIONS

Although the NYSDEC has elected to treat the Whitestown Landfill site as one "operable unit" (i.e., as one area for application of a remedy), the site lends itself to the approach of examining alternatives for each of the various affected media separately, then assembling a selected site-wide alternative from the most feasible alternative evaluated for each medium. The impacted site media (or zones of contamination for which alternatives are evaluated), and the Remedial Action Objectives for each are identified in the December 1991 Feasibility Study Report as follows:

1. **Landfilled Waste:** Remedial Action Objective is to eliminate the potential for exposure to landfilled waste or its contaminants through inhalation, dermal contact or accidental ingestion.

2. **Groundwater:** Remedial Action Objectives are to control off-site releases and preclude human health or environmental impacts from site-contaminated groundwater.

3. **Surface Soils:** Remedial Action Objective is to eliminate the potential for exposure, through dermal contact or ingestion, to soils at groundwater seeps downgradient of the site.

4. **Residential Basement:** Remedial Action Objective is to eliminate exposure to contamination in the basement of the P1 residence through inhalation, dermal contact or accidental ingestion.

Standards, Criteria and Guidance (SCGs) and other requirements considered applicable or appropriate and relevant to the Whitestown Landfill site remediation were used to guide selection of the final remedy (refer to Table 1). Chemical-specific SCGs pertain to individual compounds or contaminants, for example NYS Groundwater Standards (6 NYCRR Part 703), Surface Water Standards (6 NYCRR Part 702), and Drinking Water Standards (10 NYCRR Part 5). Where standards do not exist for a contaminant or for a medium, Guidance Values are used. These include Ambient Guideline Concentrations for air quality and Sediment Criteria for habitat protection. Location-specific SCGs are triggered by the location of contamination or of a proposed remedy, e.g. Freshwater Wetlands Rules (6 NYCRR Parts 662-664). Action-specific SCGs pertain to actions which may be undertaken as part of a site remedy, e.g. Solid Waste Management Facilities Regulations (6 NYCRR Part 360).

VII. SUMMARY OF THE EVALUATION OF THE REMEDIAL ALTERNATIVES

The discussion in this section of the development and evaluation of remedial alternatives is based upon USEPA's Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, and NYSDEC's Technical and Administrative Guidance Memoranda Nos. HWR-89-4022, Records of Decision and HWR-89-4030, Selection of Remedial Actions at Class 2 Inactive Hazardous Waste Sites.

A. DESCRIPTIONS OF ALTERNATIVES

The following are alternatives developed by the Town of Whitestown and by NYSDEC, by medium, with their capital, operation and maintenance (O&M) and present worth costs:

Landfilled waste:

W2: Landfill Closure. This alternative consists of property fencing; landfill consolidation, regrading, and capping; runoff collection and diversion structures; a passive venting system for landfill gas; and deed restrictions on future land use. Figure 5 depicts this alternative; the Contract Drawings for Final Cover (Stearns and Wheler, March 1991) provide detail on the above features. As part of cap construction, stabilization of the bluff is required to prevent excessive erosion of the bluff, which could damage the final cover or drainage structures. The Town of Whitestown is currently evaluating measures for bluff stabilization.

Alternative W2 is currently being implemented as an Early Remedial Measure in accordance with the October 1990 Modification to Order on Consent, and the September 1990 "Strategic Plan: Accelerated Remedial Actions at Class 2 Non-RCRA Regulated Landfills," endorsed by Edward O. Sullivan, NYSDEC Deputy Commissioner for Environmental Remediation. In accordance with the Strategic Plan, W2 was assessed in the FS for its appropriateness and consistency with the site-wide remedy. The FS documented that an engineered final landfill cover meeting RCRA and 6 NYCRR Part 360 requirements is the most feasible alternative for waste remediation. "No action" (Alternative W1) would not meet the requirement for a landfill to receive final cover under 6 NYCRR Part 360 and would allow generation of leachate to continue unchecked. On the other hand, removal and/or treatment of the landfilled waste (Alternative W3) would be technically impracticable, largely based upon prohibitive cost (up to $70 million).

The final cover design approved by NYSDEC in April 1991 meets 6 NYCRR Part 360 requirements for landfill gas control and for an impermeable hydraulic barrier across the entire waste mass. On steep landfill slopes, the designed final cover will include a flexible synthetic membrane as the hydraulic barrier; however, over flatter portions of the waste mass, the design specifies the RCRA-recommended hydraulic barrier consisting of both clay and a flexible synthetic membrane. In addition, the maximum final cover slope in the final design is 25 percent, leading to a larger factor of safety than required under 6 NYCRR Part 360 for slope stability. A design more stringent than Part 360 is considered appropriate for the Whitestown Landfill due to the absence of a liner, either man-made or natural, to prevent leachate generated within the landfill waste from reaching groundwater in the future. The Alternative W2 design provides greater long-term reliability and resistance to failure in the Whitestown Landfill setting than a minimal Part 360 cover.

W2 Capital Cost: $7.22 million Annual O&M: $29,000
Present Worth: $7.43 million

Groundwater:

G1: Limited Action.

Option A: As described in the FS Report, this option would consist of the periodic sampling of monitoring wells for volatile organic compounds plus selected metals and indicator parameters as described in Appendix C of the FS Report and inclusive of the minimum requirements of 6 NYCRR Part 360-2.11. No engineering controls are included in this alternative. Initially, sampling would be conducted on a quarterly basis. The frequency of sampling may later be reduced, if warranted by NYSDEC review, to semiannually for the remainder of the post-remediation monitoring period. As stated in the FS Report, the above monitoring program is the minimum remedial action appropriate for groundwater at this site and would be incorporated into any of the other alternatives described below.

NYSDEC has included for the selected remedy, in addition to the monitoring parameters, a scan for pesticides, and in addition to the above media, surface water and sediments at select locations. The frequencies and locations for these additional parameters and media may be reduced, if warranted by NYSDEC review of monitoring results. Additional monitoring wells will be installed where necessary to meet requirements of 6 NYCRR Part 360-2.11.

Capital Cost: $9000 Annual O&M: $68,000 (average)
Present Worth: $943,000

Option B: Developed by NYSDEC, this modification of the Limited Action Alternative was presented as the proposed remedial action for groundwater in the February 1992 PRAP. It consists of an expanded monitoring program with the addition of a Contingency Action Plan for groundwater control in the future if shown to be needed by the monitoring. The expanded monitoring program would include the installation of several additional monitoring wells, concentrated at the base of the bluff, on the north side of the Old Erie Canal, and along Shacksbury Road. Select groundwater, surface water, and sediment monitoring points would be tested for the baseline parameters annually and the routine parameters quarterly as defined by Part 360-2.11(c)(6). It would also include monitoring for additional compounds, including pesticides, on a periodic basis along with compounds included under Option A. The long-term monitoring would be required for a minimum of 30 years.

The Contingency Action Plan would provide for implementation of further contaminated groundwater management controls if monitoring demonstrated that the final cover alone (Waste Alternative W2) would not satisfactorily attenuate the groundwater plume and thereby achieve protection of human health and the environment for the long-term. Additionally, in the shorter term, if constituents in the groundwater beneath the landfill were to appear at the base of the bluff which would pose an increased threat to the environment (e.g. pesticides or increased concentrations of some current constituents), the Contingency Action Plan would be enacted. In designing the Contingency Action Plan, various groundwater collection and treatment methods would be evaluated to determine the most protective, cost-effective means of controlling groundwater discharges if needed. The Plan would contain explicit action criteria triggering implementation of groundwater controls, timeframes for implementation, and a preliminary design for the groundwater controls.

If Alternative G1, Option B were implemented, the exact scope of the expanded monitoring plan and the contingency action plan for Option B would be developed in the Remedial Design Stage of the Remedial Program. A rough cost estimate for Option B is given below.

Capital Cost: $29,600 Annual O&M: $90,000 (average)
Present Worth: $1.18 million

G2: Subsurface Seepage Collection System. As presented in the FS Report, the G2 alternative consists of groundwater monitoring plus a subsurface passive drain about 20 feet deep along the toe of the bluff to collect groundwater, which would be treated in an on-site treatment plant and discharged to the Old Erie Canal. On-site treatment was proposed due to the high cost per gallon quoted for treatment at the nearest POTW and the high yearly volume of collected groundwater estimated. See Figure 5 for the proposed location of the drain. Costs from the FS are revised below to reflect on-site, rather than off-site, disposal of trench spoils. Also, an extension of the drain 300 feet to the west of the location shown on Figure 5, to address the P2 residence groundwater seep, is reflected in the capital and operation costs below. Annual and present worth costs for long-term monitoring, as shown in Alternative G1, Option A, are included in the annual and present worth costs below. Subsequently, in a May 28, 1992 letter to the Town of Whitestown, the Town's consulting engineer proposed a shallower passive groundwater collection trench to address surface outbreaks of groundwater along Route 69. A estimated trench depth of ten feet would be constructed, greatly reducing the capital cost and the volume of groundwater to be collected yet would provide protection of human health and the environment. If possible, a direct connection of the collection system would be made to a nearby sewer. Trench spoils would be disposed of on-site, and long-term monitoring is included as in Alternative G1, Option A. In the cost range presented below, the lower end reflects costs for the ten-foot trench with a direct sewer connection; the upper end reflects the originally proposed deep trench with on-site treatment.

Capital Cost: $384,000 - $1.59 million
Annual: $238,000 - $412,000 (average)
Present Worth: $2.90 - $5.91 million

G3: Subsurface Seepage Collection System with Partial Cutoff Wall. This alternative consists of a passive subsurface drain with complete on-site treatment of leachate (the same components as described in the FS Report for Alternative G2) with the addition of a groundwater cutoff wall immediately downgradient of the drain, keyed into the glaciolacustrine aquitard, to increase the efficiency of collection. On-site disposal of trench spoils, extension of the trench and wall to Residence P2, and long-term monitoring are reflected in the cost estimates below.

Capital Cost: $2.40 million Annual: $412,000 (average)
Present Worth: $6.71 million

G4: Partial Cutoff Wall with Interceptor Well System. Alternative G4 consists of a groundwater cutoff wall with an array of interceptor wells in place of the drain depicted on Figure 5. Again, on-site treatment of leachate to discharge standards is proposed.

On-site disposal of trench spoils, extension of the well array and wall to Residence P2, and long-term monitoring are reflected in the cost estimates below.

Capital Cost: $2.73 million Annual: $408,000 (average)
Present Worth: $6.98 million

Surface Soils:

S3: Excavation and Off-Site Disposal. This alternative for surface soils was the only one which passed through the screening process in the FS; an alternative consisting of institutional and access controls only (S1) was rejected as being ineffective and in-situ treatment (S2) as not technically implementable. S3 consists of excavation of surface soils at contaminated groundwater seeps with proper disposal of the soils. Upon excavation the affected areas will be backfilled with either low permeability material or granular material, depending on the rate of seepage, to prevent surface outbreaks of groundwater from reoccurring, as a supplement to groundwater control actions. Based on soil sampling during the RI, it appears feasible to dispose of the contaminated soils on-site, rather than hauling to an off-site facility, as evaluated in the FS. The costs shown below for Alternative S3 were revised to reflect on-site disposal. The method of seep control will be evaluated and selected during the Remedial Design stage of the program.

S3 Capital Cost: $21,000 Annual O&M: $0
Present Worth: $21,000

Residential Basement (P1 Residence):

The FS did not carry through detailed evaluation a No-Action alternative (R1) and redesigning the basement sump (R2), since these were determined to be comparatively ineffective measures to meet the Remedial Action Objective for the Residential Basement.

R3: Seal Basement. Alternative R3 consists of decontaminating and sealing the basement. The soil floor of the basement would be replaced by a concrete slab, the walls decontaminated, and a clay liner and perimeter base drain placed around the outside of the basement. (An alternative R4, similar to R3 but including a groundwater diversion trench, was not analyzed in detail since it provides little improvement over R3 in terms of effectiveness).

Capital Cost: $150,000 Annual O&M: $17,000
Present Worth: $317,000

R5A and R5B: Remove Residence. Option A of this alternative is to acquire and demolish the residence only; Option B is to acquire both the residence and the adjacent service station. Either option would involve subsequent demolition of the structures, backfilling the

basement and implementation of deed restrictions. Remediation of the underground storage tanks may be required if the gas station is purchased.

Capital Cost/Present Worth (Option A): $136,000
Capital Cost/Present Worth (Option B): $388,000
Annual O&M: negligible

R6: Place House On a Concrete Pad. This alternative consists of lifting the house, backfilling the basement, and replacing the house on a concrete slab with a ventilated crawlspace beneath. The loss of basement storage space would be compensated for through construction of a storage shed of equivalent size on the property.

Capital Cost: $118,000 Annual O&M: negligible
Present Worth: $118,000

R7: Move House to Unaffected Comparable Property. The house would be separated from the existing foundation, moved to a new property, and placed on a new foundation and basement.

Capital Cost: $165,000 Annual O&M: $0
Present Worth: $165,000

B. EVALUATION OF ALTERNATIVES

The following discussion summarizes the evaluation of alternatives for Groundwater and the Residential Basement (the media for which more than one viable alternative was developed) performed using the seven applicable evaluation criteria described on Table 2 and in USEPA and NYSDEC guidance, consistent with the Remedial Action Objectives:

Groundwater Alternatives

Short-Term Impacts and Effectiveness:

Alternatives G2, G3, and G4 would provide for a more immediate improvement of groundwater quality on the downgradient side of the groundwater collection and/or cutoff line than G1, Options A and B. Residual groundwater contamination downgradient of collection may require much more time than the minimum estimate - four years, based upon the velocity of groundwater flow - to be reduced to remedial goal levels. This long remediation period is caused by the slow rate of groundwater movement through the soils, and by the tendency of some contaminants to cling to soil particles and later re-contaminate groundwater. It is believed that repeated flow-throughs of clean groundwater may be needed to reduce concentrations in the downgradient zone to an acceptable level. This period would be indefinite if no collection was implemented, however. No groundwater collection (Alternative G1, Option A), or deferred collection (G1, Option B) would not address the current situation of groundwater seeps at the P2 residence or along Route 69, which pose a current exposure to humans and

wildlife. An additional consideration is that odors, vapors or dust could be generated during excavation in Alternatives G2, G3, and G4 from the exposure of contaminated soils; however these air impacts are likely to be minimal and readily controlled with ordinary health and safety measures to protect workers and passers-by. Of the collection alternatives, G2 would take the least time to complete and create the least potential disturbance or impact.

Long-Term Effectiveness:

All landfilled waste will be contained under Waste Alternative W2, and the long-term effectiveness of W2 to retard further leachate generation from landfill wastes is excellent; in the long term virtually no contaminants should leach from the landfill to the aquifer because there will be negligible water input to the landfilled materials. In view of this consideration, the Limited Action Alternative (G1) and the collection alternatives become more comparable in effectiveness over the extreme long-term. Nonetheless, the current and ongoing situation of surface outbreaks of groundwater is estimated to persist for a minimum of twenty years following completion of the final cover, and presents a potential for human exposure to groundwater contaminants which may not be reliably addressed by Groundwater Alternative G1 in combination with Surface Soil Alternative S3. Uncontrolled migration of affected groundwater into the canal until the final cover takes effect may cause significant deterioration of canal and wetland habitats. Deferral of groundwater collection does not appear to be appropriate given the evidence of ongoing seepage into the Canal and the potential for long-term impact. The collection and treatment alternatives would, within the limitations discussed under Short-term Impacts and Effectiveness, eliminate the outbreaks of leachate at the P2 residence and along Route 69, eliminating human exposure to landfill contaminants and as discussed further, eliminating or minimizing the migration of contamination to the Canal.

Reduction of Toxicity, Mobility and Volume Through Treatment:

No waste (the contaminant source) is treated under any of the groundwater alternatives. Alternatives G2, G3, and G4, which include groundwater collection and treatment, would reduce the mobility of the groundwater plume. However, NYSDEC considers this a containment of the source and not an irreversible, permanent measure. Alternative G1 would not reduce mobility of landfill contaminants presently in the water table beneath the bluff.

Implementability:

Alternative G1, Options A and B require little or no construction and few permits or approvals. A greater degree of administrative coordination would be expected in the implementation of Alternatives G2, G3, and G4 due to the need for obtaining State Pollution Discharge Elimination System (SPDES) discharge parameter limits in the case of

on-site treatment, and most critically in Alternative G2, where permission would have to be obtained for a direct sewer connection to the POTW in order to minimize O&M costs. Coordination needed with other regulatory agencies would follow normal regulatory processes. The technologies employed in all of the alternatives are generally available commercially, with the possible exception of an innovative bio-slurry method proposed for lower-cost, faster deep trench construction in Alternatives G2 and G3.

Of the three collection alternatives G3 may be considered the most reliable and effective in terms of intercepting and treating all groundwater leaving the site. A collection trench alone, as in Alternative G2, which is limited in practical depth to twenty feet could prove less efficient in this regard. The addition of a slurry wall keyed into a low-permeability stratum, as proposed in Alternative G3, would 1) prevent contaminated groundwater from flowing beneath the trench and escaping; and 2) prevent backflow of cleaner downgradient water into the trench, since this could, at greater depths, significantly diminish the rate of contaminant removal and treatment. However, G2 would be effective at meeting the remedial action objectives since the collection trench would intercept the upper ten to fifteen feet of groundwater, where most landfill-related contaminants were found. The groundwater seeps creating points of human exposure, and shown to be potentially affecting the Old Erie Canal in the RI, originate in the shallow zone of groundwater. The depth of the G2 trench could be optimized to capture this zone of groundwater while minimizing the depth of the trench and the volume of groundwater collected. At the proper trench depth, Alternative G2 would eliminate nearly all the surface seeps posing an unacceptable human exposure and contributing to pollution of the Old Erie Canal. Concerning G4, though wells are easier to install than the passive collection trench, the difficulties in operation and maintenance which are likely to result from the high silt content of the aquifer render wells a less desirable collection technology than a trench.

Compliance with SCGs:

As discussed under Implementability, Alternatives G2, G3, and G4 would collect the bulk of landfill-related contaminants in groundwater, and thereby could remediate groundwater between the bluff and the canal to SCG compliance for site-related contaminants. Although the affected groundwater is not used as a drinking water source, it flows into the Old Erie Canal and in turn, the protected wetland. Surface water standards and sediment guidance criteria were contravened in the Old Erie Canal for metals and PAH compounds. The origin of the PAHs does not appear to be the landfill, based on comparison with groundwater concentrations. Intercepting and collecting groundwater at the bluff base would not likely remedy these exceedances of PAH sediment criteria in the Canal, but may aid in preventing further exceedances of surface water standards and sediment criteria for metals, which may be caused by landfill-impacted groundwater seeps. Additionally, future long-term releases of leachate and possible exceedances of aquatic surface water

standards for volatile organic compounds noted in landfill groundwater would be prevented if one of the collection alternatives was implemented. Deferral of collection (Alternative G1) would require extensive further study to demonstrate that current exceedances of standards in the Canal for landfill-related parameters would not have a detrimental affect on aquatic life, thereby justifying a variance from compliance.

Overall Protection of Human Health and the Environment:

In addressing potential exposure to landfill contaminants through surface seeps along Route 69, in the P2 residence yard, and other downgradient locations, Alternative G1 would provide no means of intercepting and controlling shallow groundwater, so as to prevent additional or worsened outbreaks in areas of human contact. Uncollected groundwater would also continue to contribute to pollution of the Old Erie Canal and the wetland. Of the collection alternatives, Alternatives G3 and G4 appear to offer the fullest degree of groundwater collection. However, since much more contamination appeared in water table wells during the RI, rather than deep wells near the base of the bluff, alternative G2 with the proper trench depth could collect the bulk of landfill-related contamination, prevent its release to surface soils and the Old Erie Canal, and provide for its treatment. In combination with surface soil alternative S3 to address current soil contamination, Alternative G1 would not be adequately protective of human health or the environment, whereas in combination with S3 Alternatives G2, G3, or G4 would provide adequate protection of both human health and the environment.

Cost:

Alternative G1 Options A and B carry lower capital and present worth costs than the other alternatives. Alternative G2 is the least costly of the collection alternatives, and presents the most potential for optimization of depth and groundwater collection rate. Alternative G2 is also the most cost-effective to extend as needed to address the P2 residence seep. With optimization of depth and treatment methods, Alternative G2 may approach the capital and annual O&M costs of additional studies and expanded monitoring necessary to implement Alternative G1, Option B.

Residential Basement Alternatives

Short-Term Impacts and Effectiveness:

Removal of the P1 residence or of both the residence and the gas station (Alternative R5, Options A and B), depending on the purchase agreement arrived at with the property owner, would eliminate the current human exposure to pollutants most quickly. The other alternatives, Seal Basement (R3), Place House on a Concrete Slab (R6), and Move House to Unaffected Comparable Property (R7) involve various

degrees of construction with both attendant delays in implementation and increased potential for impacts to workers, nearby residents and the environment, especially Alternative R3 where contaminated subsurface materials would be exposed. Once completed, however, these alternatives would immediately eliminate the potential for exposure.

Long-Term Effectiveness and Permanence:

By removing the residents from the affected property and preventing future occupation of the site through deed restrictions, Alternatives R5 and R7 would permanently eliminate the exposure pathway between humans and contaminants. Alternative R6 is less reliable in the long-term since residents remain on-site. Even if groundwater collection is implemented as described in the Groundwater Alternatives G2, G3, or G4, as explained previously, residual contaminants may require a indefinite period to be sufficiently washed from the soils downgradient of the collection system and surrounding the residence. Alternative R3 is still less reliable since the basement remains in place and proper operation and maintenance (O&M) procedures must be practiced over the next twenty to thirty years to ensure future exposure does not occur.

Reduction of Toxicity, Mobility and Volume Through Treatment:

None of Residential Basement Alternatives reduce toxicity, mobility or volume of site contaminants. The object of each of the proposed actions is to isolate the occupants of the home from contaminated soils and groundwater, the treatment of which is dealt with separately in the FS. Alternative R3 does provide treatment of collected and diverted groundwater, but this treatment is secondary to its function of isolating the basement from contamination.

Implementability:

From a technical standpoint, buyout and demolition of the residence (Alternative R5, Option A) is the most easily implemented alternative. However, negotiations for purchase of the home could delay its implementation of this alternative. From a legal standpoint, Alternative R3 involves the least change of use to the property owner, and therefore it may be easiest to obtain access or permission to proceed with this alternative. Alternatives R3 and R6 are implemented on-site and would avoid extensive coordination and obtaining of permits as would be necessary if R7 were selected. Both R6 and R7 entail significant risk of damage to the house in separating it from its foundation and in Alternative R7, moving the house. In view of all of the above concerns, Alternative R7 appears to be the most difficult to implement.

Compliance with Standards, Criteria, and Guidance (SCGs):

None of the alternatives contemplated for the residential basement were found to conflict with action-specific SCGs. Chemical-specific SCGs for the most likely routes of exposure (air and dermal contact) were not found to be contravened in the residence, although groundwater SCGs were exceeded for several parameters.

Overall Protection of Human Health and the Environment:

For preventing future human exposure to contamination, the alternatives involving removal of the present and any future residents from the P1 property are optimal (Alternatives R5 and R7). If the house and occupants must remain on the property, R6 is preferable to R3 in terms of long-term reliability of the controls used to isolate the people from contamination. Alternative R3, however, if properly maintained, would be protective.

Cost:

Alternative R6 has the lowest capital cost with negligible O&M, followed by Alternatives R5, Option A, and R7, which also contain little O&M cost. Alternative R3 is significantly more costly in terms of present worth, though the capital expense is comparable to R5A, R6, and R7. Most expensive is R5, Option B. Costs of the buyout alternative R5 are sensitive to the negotiated agreement with the property owner.

VIII. HIGHLIGHTS OF COMMUNITY PARTICIPATION

There has been significant public interest by the residents in the immediate vicinity of the site throughout the entire remedial process. There have been a series of public meetings and additional project status updates at Town Board meetings. The following chronology summarizes these meetings:

July 7, 1989: Special Town Board Meeting concerning the landfill.

October 18, 1989: Public Meeting concerning RI/FS work plans.

February 15, 1990: Special Town Board Meeting concerning the landfill.

June 26, 1991: Public Meeting to present final cover (Alternative W2) plans.

March 5, 1992: Public Meeting to present the PRAP.

A Citizen Participation (CP) Plan was developed and implemented by the Town of Whitestown with input, oversight, and participation by the NYSDEC. All major reports were placed in document repositories in the vicinity of the site and made available for public review. A public contact list was developed and used to distribute fact sheets and meeting announcements.

Inquiries and comments (written and verbal) were received and responded to throughout the course of the project from citizens and local and State government officials. Comments received regarding the Proposed Remedial Action Plan have been addressed and are documented in the Responsiveness Summary (Appendix 4).

IX. SELECTED REMEDY

The remedy selected for the site by the NYSDEC was developed in accordance with the NYS Environmental Conservation Law (ECL) and is consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA).

Based upon consideration of the remedial alternatives described in Section VII of this ROD and the criteria for evaluation, NYSDEC has selected a remedy containing the following media-specific alternatives: Landfill Waste Alternative W2 - Landfill Closure, Groundwater Alternative G2 - Subsurface Groundwater Collection, and Soil Alternative S3 - Excavation and Off-site Disposal, plus remedial measures to protect residents of the affected properties P1 and P2. For Residence P1, the Feasibility Study recommends Alternative R5, Option A, which NYSDEC and NYSDOH have found to be adequately protective. The P2 property seep may be addressed effectively through the extension of the Alternative G2 collection trench and removal of soils under Alternative S3. The total capital cost of the site-wide remedy, including the P1 residence removal, is estimated to be from $7,761,000 to $8,966,000, depending upon optimization of Alternative G2, with a total present worth between $10,478,000 and $13,498,000, again dependent upon optimization of groundwater collection and treatment. In accordance with the National Contingency Plan (40 CFR Part 300.430(f)) concerning selection of remedy, the NYSDEC has determined that the change in remedy from the proposed plan to the selected remedy could be reasonably anticipated by the public based on the alternatives presented in the PRAP.

Should the Town of Whitestown be unable to negotiate a purchase of the affected property P1 within one year of the Record of Decision (ROD), the Town will be required to implement another effective measure to eliminate the current exposure to landfill contaminants on the P1 property.

Major components of the selected remedy include the following:

1. Excavation of refuse from southern portions of the landfill property to consolidate into the main landfill mass, with reclamation of the excavated areas.

2. Excavation and regrading of the main landfill mass to achieve slopes compliant with 6 NYCRR Part 360 and conducive to long-term slope stability.

3. Stabilization of the bluff face north of the landfill to prevent erosion or slope failure from causing damage to the final cover or drainage structures.

4. Construction of an engineered multimedia final landfill cover over the main waste mass, including stockpiled petroleum-contaminated soils in the southeast area of the landfill. The cover will include a passive vent system for landfill gas. If post-construction monitoring shows gas emissions to present an unacceptable health risk, the vent system will be converted to an active one.

5. Construction of a surface water diversion system sufficient to protect the final cover and the bluff from excessive erosion. Runoff will be diverted down Shacksbury Road on the west side of the site and down the bluff face on the east side, at the site of the former gabion wall, into the Old Erie Canal.

6. Institutional controls to prevent use of groundwater or future development of property onsite and vacant properties downgradient of the site between the bluff and the Old Erie Canal shall be implemented by the Town of Whitestown.

7. Installation of a subsurface collection system to intercept shallow groundwater in the plume area, including the P2 property. Collected groundwater will be treated on-site to SDPES discharge standards and discharged to the Old Erie Canal, or transported to a publically-owned treatment works (POTW).

8. While the subsurface collection system over time is also expected to eliminate exposure to contamination in the basement of the P1 residence, measures must be implemented at the P1 residence to ensure the elimination of any current exposure.

9. Where feasible, removal of the soils at the bluff base contaminated by leachate outbreaks; replacement of the soils with material which will contain or divert leachate from breaking out at ground surface.

10. Environmental monitoring to determine the effectiveness of the remedial program. Groundwater, surface water, sediment, and landfill vent gases will all be subjected to a periodic monitoring program designed to detect any changes in the effectiveness of the remedial program.

The above remedy has been selected with the goal of eliminating, in a cost-effective manner, current or future human and biota exposure to contaminated media found at or adjacent to the Whitestown Landfill site, and with the goal of facilitating gradual restoration of groundwater in the plume zone to ambient quality.

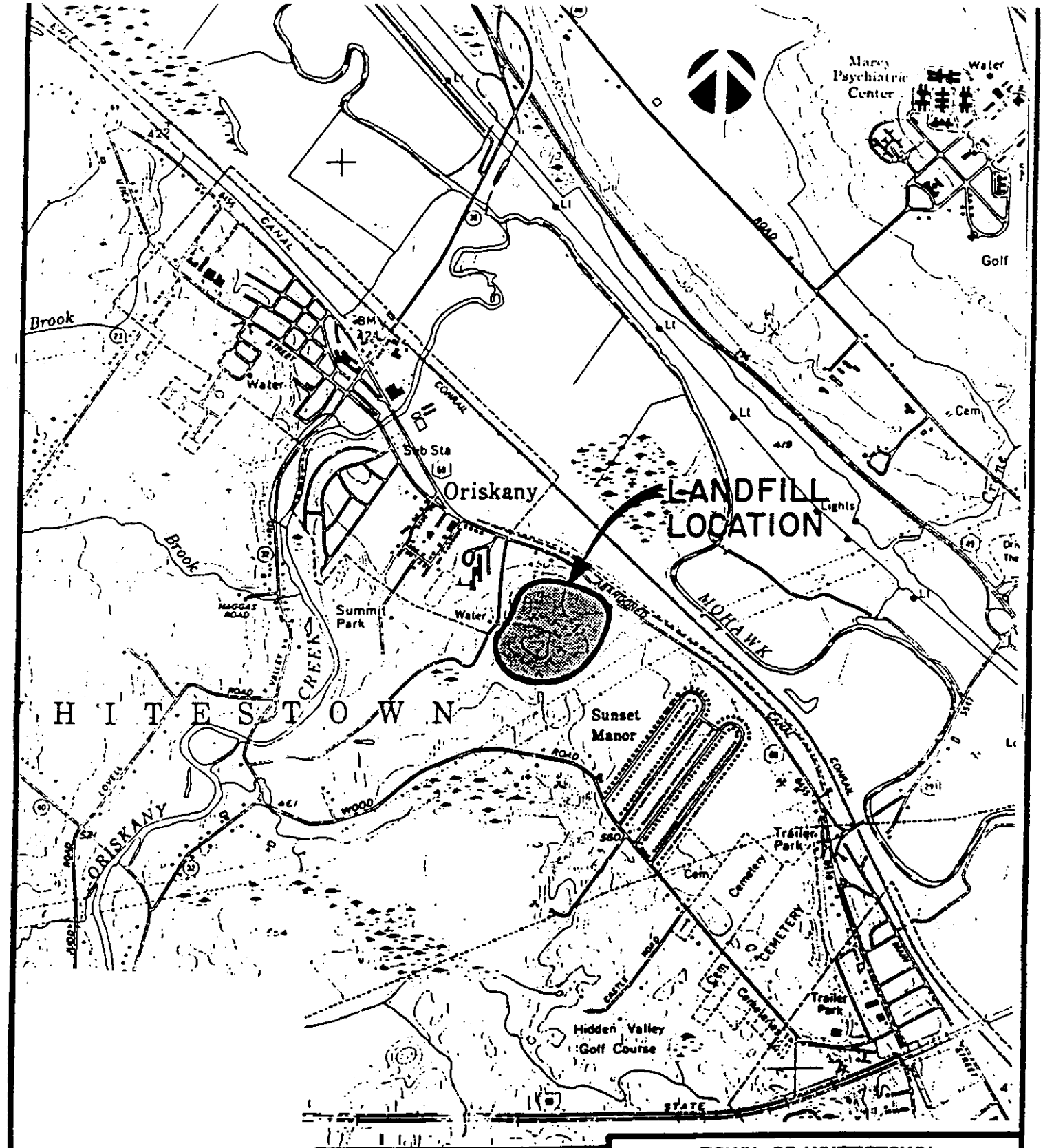
X. DOCUMENTATION OF SIGNIFICANT CHANGES

The March 1992 PRAP identified a site-wide remedy containing Groundwater Alternative G1, Option B: Limited Action with Expanded Monitoring and a Contingency Action Plan, as the State's proposed

remedy, based upon information in the Administrative Record up to that time. Based upon new and significant information, the State has selected a site-wide remedy including Alternative G2 for groundwater in this ROD.

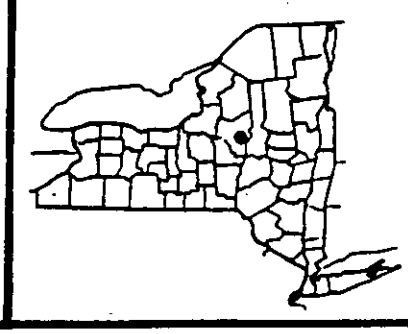
Subsequent to the public comment period for the PRAP, a groundwater seep was discovered in early April 1992 in the yard of a residential property (P2) west of the plume area previously identified in the RI. The P2 seep was sampled and determined to contain landfill-related contaminants. In addition, outbreaks of leachate-contaminated groundwater more severe than observed during the RI/FS were noted at this time along Route 69, some in new locations in the roadside ditch to the east of the P1 residence, others along the Old Erie Canal, especially surrounding the newly-constructed eastern discharge outlet for stormwater from the landfill. The seepages under such conditions as noted in April 1992 pose an unacceptable exposure of the public to landfill contaminants that would not be adequately controlled by the site-wide remedy proposed in the PRAP. It was also demonstrated under these conditions that landfill-contaminated groundwater has a direct pathway to biota in the Old Erie Canal, and eventually to the high-quality wetlands fed by the Canal. NYSDEC has determined that further study, including biological sampling, would be required to demonstrate that the seeps were not impacting the Old Erie Canal and wetlands habitats if this pathway were not to be intercepted through groundwater collection. Currently, metals in landfill-contaminated groundwater also appear in deleterious concentrations in Canal surface water and sediment. Other contaminants harmful to biota, such as pesticides, may appear in landfill-impacted groundwater in the future.

NYSDEC has chosen rather to implement a site-wide alternative containing Groundwater Alternative G2, Subsurface Collection System, with a focus in Remedial Design on optimizing features of this alternative (particularly the depth of the collection trench) to address the main threat of the site, the contamination in shallow groundwater, while minimizing the capital and O&M costs of this alternative. This site-wide alternative will also address the seep on the P2 property. The conditions observed in April 1992 are among those that would have led NYSDEC to require implementation of the Contingency Action Plan previously proposed as part of a Limited Action Alternative for groundwater.



SCALE 0 2000 Feet

REF: U.S.G.S. ORISKANY QUADRANGLE



TOWN OF WHITESTOWN
Whitestown, New York

FIGURE 1

SITE LOCATION MAP

HARZA ENGINEERING COMPANY, INC. Consulting Engineers — PROJECT MANAGER

CHICAGO, ILLINOIS — DATE 9/91 — DRAWING NO. Exhibit

FIGURE 2: WATER TABLE SURFACE MAP

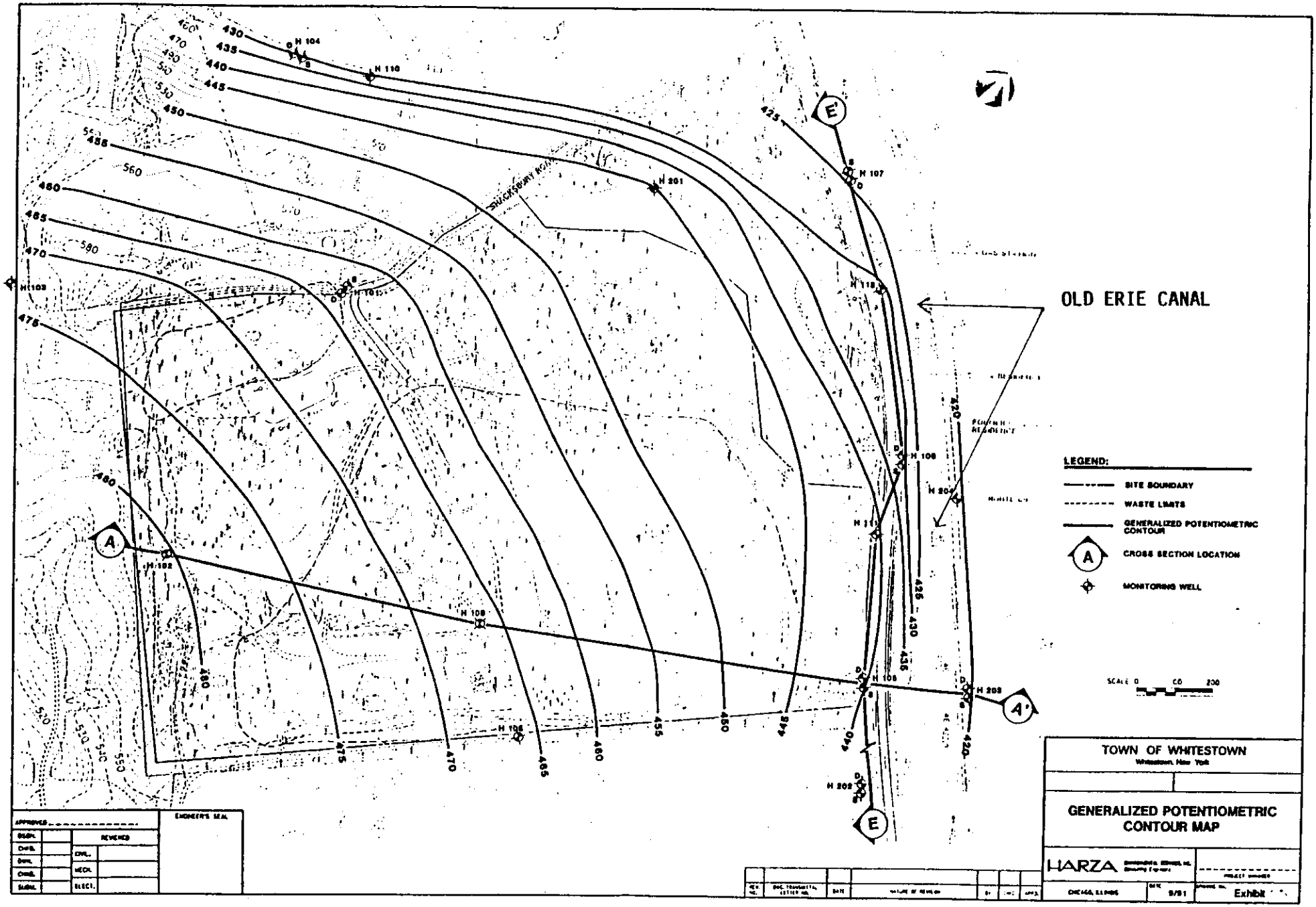


FIGURE 3: PATTERN OF GROUNDWATER CONTAMINATION (RI RESULTS)

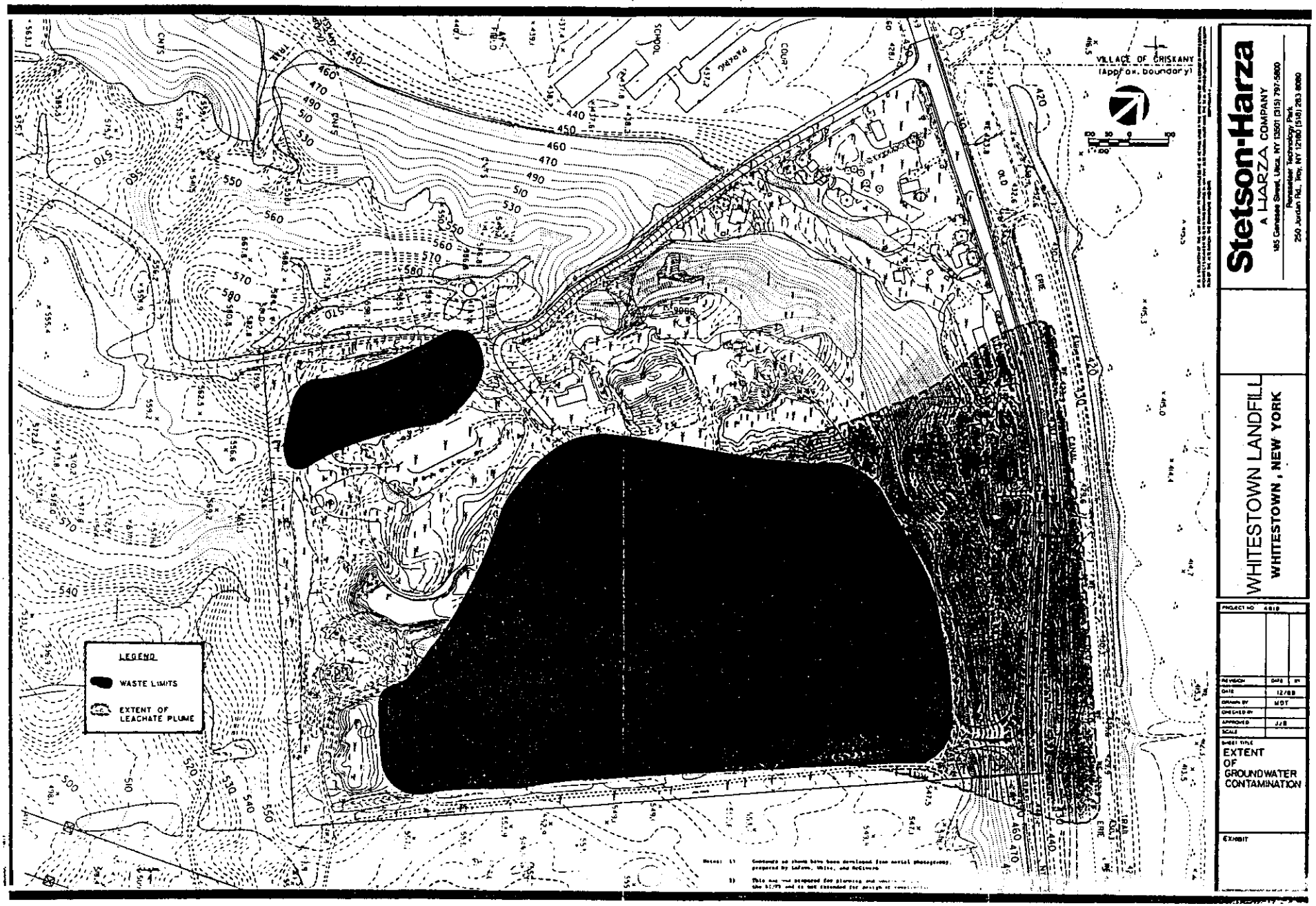


FIGURE 4: SAMPLING AND MEASUREMENT LOCATIONS

FIGURE 5: ALTERNATIVES W2, G2 AND G3

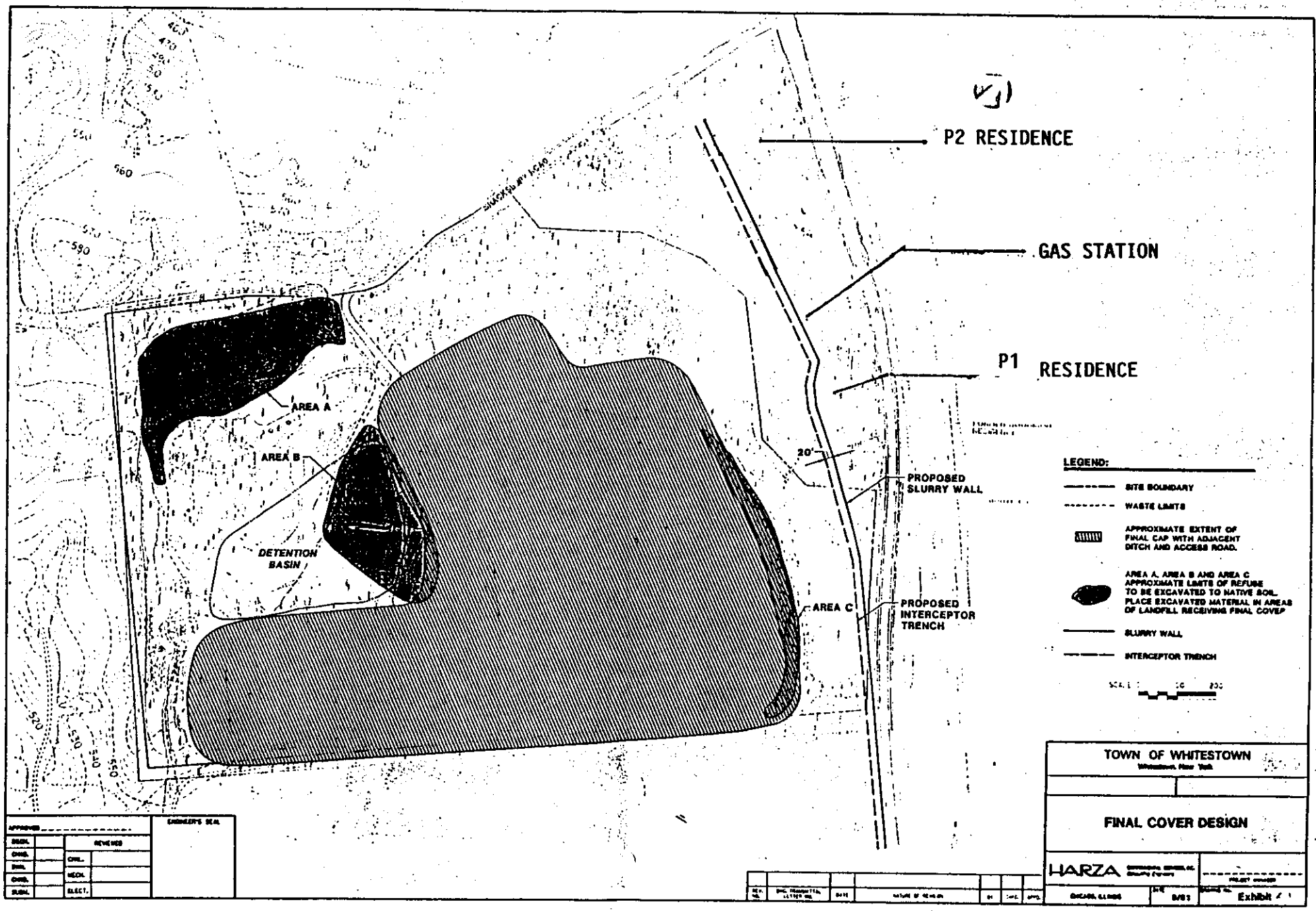


TABLE 1
DOCUMENTATION OF SCGs
WASTE, SOIL, AND RESIDENTIAL BASEMENT

SCGs	Alternative W2 Landfill Closure	Alternative S3 Excavation/Off-Site Disposal	Alternative R3 Seal Basement	Alternative R5, R6, and R7 Remove Residence, Place House on Concrete Pad, Move House to Unaffected Comparable Property.
Chemical Specific				
1. 40 CFR 262.11 Hazardous Waste Determination		Will Comply with 40 CFR 262.11	Will Comply with 40 CFR 262.11	Will Comply with 40 CFR 262.11
Action Specific				
2. NYCRR 360-2.13 Landfill Construction Requirements	Will Comply with NYCRR 360-2.13			
3. NYCRR 360-2.15 Landfill Closure and Post-Closure Criteria	Will Comply with NYCRR 360-2.15			
4. 40 CFR 252.20 Manifest Records, Transport		Will Comply with 40 CFR 262.20	Will Comply with 40 CFR 262.20	Will Comply with 40 CFR 262.20
5. NYCRR 257.56 Air Quality		Will Comply with NYCRR 257	Will Comply with NYCRR 257	

TABLE 1
DOCUMENTATION OF SCGs
GROUNDWATER

SCGs	Alternative G1 Limited Action - Monitor Groundwater	Alternative G2 Subsurface Seepage Collection System with On-Site Treatment and Discharge to the Erie Canal.	Alternative G3 Subsurface Seepage Collection System with Downgradient Cutoff Wall. Treatment and Discharge as Alternative G2.	Alternative G4 Partial Cutoff Wall with Upgradient Interceptor Wells. Treatment and Discharge as Alternative G2.
Chemical Specific				
1. Volatile Compounds, Semi Volatile Compounds, Metals.	Federal MCLs and State GWQS and are not achieved in groundwater	Federal MCLs and State GWQS are achiveved in groundwater. Federal and State surface water quality standards met under SPDES Permit.	Federal MCLs and State GWQS are achiveved in groundwater. Federal and State surface water quality standards met under SPDES Permit.	Federal MCLs and State GWQS are achiveved in groundwater. Federal and State surface water quality standards met under SPDES Permit.
Action Specific				
2. NYCRR 373-2.6 (j) Compliance Monitoring and Reporting.	Will not comply with 373-2.6 (j) (9) No corrective action enacted.	Will comply with 373-2.6 (j)	Will comply with 373-2.6 (j)	Will comply with 373-2.6 (j)
3. NYCRR 373-2.6 (k) Corrective action program.	Will not comply with 373-2.6 (k)	Will comply with 373-2.6 (k)	Will comply with 373-2.6 (k)	Will comply with 373-2.6 (k)
4. 40 CFR 262.11 Hazardous Waste Determination	-	Will comply with 40 CFR 262.11	Will comply with 40 CFR 262.11	Will comply with 40 CFR 262.11
5. 40 CFR 264.10 General Facility Standard	Will comply with 40 CFR 264.10	Will comply with 40 CFR 265.10	Will comply with 40 CFR 265.10	Will comply with 40 CFR 265.10
6. 40 CFR 264.90-100 Releases, Corrective Action	Will not comply with 40 CFR 264.90 No remediation enacted.	Will comply with 40 CFR 264.90	Will comply with 40 CFR 264.90	Will comply with 40 CFR 264.90
7. 40 CFR 264.110 and NYCRR 360-2 Post-Closure Plan	Will not comply with 40 CFR 264.110 and NYCRR 360-2 No remediation enacted.	Will comply with 40 CFR 264.110 and NYCRR 360-2	Will comply with 40 CFR 264.110 and NYCRR 360-2	Will comply with 40 CFR 264.110 and NYCRR 360-2
8. 40 CFR 265.400 Treatment Facilities	-	Will comply with 40 CFR 265.400	Will comply with 40 CFR 265.400	Will comply with 40 CFR 265.400
9. NYCRR Title 6 Part 750-758 SPDES	-	Will comply with 750-758	Will comply with 750-758	Will comply with 750-758
10. NYCRR Part 257-5,-6 Air Quality	-	Will comply with 257-5,-6	Will comply with 257-5,-6	Will comply with 257-5,-6
Location Specific				
11. 40 CFR 264.18(b) Location of TSD in 100 year floodplain	-	Will comply with 40 CFR 264.18(b)	Will comply with 40 CFR 264.18(b)	Will comply with 40 CFR 264.18(b)

TABLE 2

CRITERIA FOR DETAILED ANALYSIS OF ALTERNATIVES	
Short-Term Effectiveness	• Protection of Community During Remedial Actions. • Protection of Workers During Remedial Actions. • Environmental Impacts. • Time Until Remedial Action Objectives are Achieved.
Long-Term Effectiveness	• Magnitude of Residual Risk. • Adequacy of Controls. • Reliability of Controls.
Reduction of Toxicity, Mobility and Volume	• Treatment Process Used and Material Treated. • Amount of Hazardous Materials Destroyed or Treated. • Degree of Expected Reductions in Toxicity, Mobility, and Volume. • Degree to Which Treatment is Irreversible. • Type and Quantity of Residuals Remaining after Treatment.
Implementability	• Ability to Construct and Operate the Technology. • Reliability of the Technology. • Ease of Undertaking Additional Remedial Actions, if Necessary. • Ability to Monitor Effectiveness of Remedy. • Ability to Obtain Approvals from Other Agencies. • Coordination with other Agencies. • Availability of Off-site Treatment, Storage, and Disposal Services and Capacity. • Availability of Necessary Equipment and Specialists. • Timing of New Technology Under Consideration.
Cost	• Capital Costs. • Operating and Maintenance Costs. • Present Worth Cost.
Protection of Human Health and the Environment	• How Alternative Provides Human Health and Environmental Protection.
Compliance with SCGs	• Compliance with Contaminant-Specific SCGs. • Compliance with Action-Specific SCGs. • Compliance with Location-Specific SCGs. • Compliance with Other Criteria, Advisories, and Guidances.

APPENDIX 1
Administrative Record
Whitestown Municipal Landfill
Oneida County, New York I.D. No. 6-33-013

Documents

A. Data Summary Package for P2 Residence Sample, prepared by Galson Laboratories; April 22, 1992.

B. Transcript of Public Informational Meeting Held at Town of Whitestown Offices, prepared by Barbara A. Durand; March 5, 1992.

C. "Proposed Remedial Action Plan: Whitestown Municipal Landfill," prepared by NYSDEC, February 22, 1992.

D. Legal Notice Re: public comment period, informational meeting, and availability of Administrative Record for the Whitestown Municipal Landfill inactive hazardous waste site, published in the Utica Observer-Dispatch on February 22, 1992.

E. Public Notice Re: public comment period, informational meeting, and availability of Administrative Record for the Whitestown Municipal Landfill inactive hazardous waste site, mailed to adjacent residents, elected officials, potentially responsible parties, and other concerned individuals and groups, on or about February 22, 1992.

F. "Revised Whitestown Landfill Feasibility Study," prepared by Stetson-Harza, December 1991.

G. "Geotechnical Report: Slope Investigation, Town of Whitestown, New York," prepared by Stearns and Wheler; August 1991.

H. "Whitestown Landfill Remedial Investigation," Volumes I-III, prepared by Stetson-Harza, May 1991.

I. "Contract Documents for Final Cover For Municipal Landfill, NYSDEC Class 2 Inactive Hazardous Waste Site Code No. 633013, Contract No. 1, Town of Whitestown, New York," prepared by Stearns and Wheler, March 1991.

J. Contract Drawings For Final Cover, Whitestown Municipal Landfill, prepared by Stearns and Wheler, March 1991.

K. "Whitestown Landfill Revised Baseline Risk Assessment," prepared by C.C. Johnson and Malhotra, P.C., March 1991.

L. "Laboratory Data-Phase II, Volumes I and II: Whitestown Landfill Remedial Investigation," prepared by Stetson-Harza, March 1991.

M. "Whitestown Landfill Draft Habitat Based Assessment," with Addendum, prepared by C.C. Johnson and Malhotra, P.C., December 1990.

N. Modification to Order on Consent between NYSDEC and the Town of Whitestown, executed on October 10, 1990, Index No. A6-0241-90-08. Extension of landfill operation until January 1991; early design and construction of final cover.

O. "Whitestown Landfill Revised Solid Waste Management Plan," prepared by Stetson-Harza, September 1990.

P. "Revised Phase II Work Plan: Whitestown Landfill Remedial Investigation," prepared by Stetson-Harza, September 1990. Health and Safety Plan in a separate volume.

Q. "Draft Report, Volumes I-V: Whitestown Landfill Remedial Investigation," prepared by Stetson-Harza, July 1990. Includes laboratory data from the Phase I Remedial Investigation.

R. "Whitestown Landfill Potential Remedial Technologies Report," prepared by Stetson-Harza, November 1, 1989.

S. "1986 Environmental Quality Bond Act Title 3 State Assistance Contract No. C300010" executed September 1989 between the State of New York and the Town of Whitestown.

T. "Whitestown Landfill Remedial Investigation Proposed Project Work Plan," prepared by Stetson-Harza, Inc., July 1989. Volume includes the Work Plan, the Quality Assurance Project Plan, the Health and Safety Plan, and the Citizen Participation Plan.

U. "Whitestown Landfill Solid Waste Management Plan," prepared by Stetson-Harza, June 1989.

V. "Existing Data Report: Town of Whitestown Remedial Investigation of Landfill," prepared by Stetson-Harza, February 1989.

W. Order on Consent between NYSDEC and the Town of Whitestown, executed on November 29, 1988, Index No. A6-0140-88-02. Cessation of Landfilling by September 1990; Implementation of a Remedial Program.

X. "Groundwater Contamination Assessment of the Town of Whitestown Sanitary Landfill," prepared by Dunn Geoscience Corporation, December 1986.

Correspondence

A. Letter from Mr. John Brady, Stetson-Harza, to Mr. William Barry, Town of Whitestown, Re: Options for groundwater collection; May 28, 1992.

B. Letter from Mr. William J. Barry, Town of Whitestown, and members of the Town Board to Edward O. Sullivan, NYSDEC, Re: Concerns whether the final remedy might contain groundwater collection and about remedial costs; March 23, 1992.

C. Letter from Mr. and Mrs. John and Jane Busacker et. al., Town of Whitestown residents, to Kathleen McCue, NYSDEC, Re: Request for additional monitoring wells as part of the remedy; March 21, 1992.

D. Letter from Ms. Virginia C. Robbins, Bond, Schoeneck and King, to Ms. Kathleen McCue, NYSDEC, Re: Questions concerning the PRAP on behalf of Steel Treaters, Inc; March 20, 1992.

E. Letter from Mr. Donald F. Rothdiener, Village of Oriskany, to Ms. Kathleen McCue, NYSDEC, Re: Questions and comments concerning the PRAP; March 16, 1992.

F. Letter from Brian Dam, Oneida County Environmental Management Council, to Kathleen A. McCue, NYSDEC, Re: comments concerning the PRAP; March 10, 1992.

G. Letter from Louis P. Ferrara, Oneida County Department of Health, to Kathleen McCue, NYSDEC, Re: Comments on the PRAP; March 9, 1992.

H. Letter from Mr. Vincent J. Coyne, Town of Whitestown resident, to Ms. Kathleen McCue, NYSDEC, Re: Questions concerning the PRAP; March 7, 1992.

I. Letter from Mr. Thomas P. Schlesser, Stearns and Wheler, to Mr. William Barry, Town of Whitestown, Re: discussion of options for and preliminary design for bluff stabilization measures; January 29, 1992.

J. Letter from Mr. Edward L. Moore, Stetson-Harza, to Kathleen McCue, NYSDEC, Re: Results of literature search on the effects of Old Erie Canal contaminants on fish, December 19, 1991. Attachments.

K. Letter from Ms. Kathleen A. McCue, NYSDEC, to Mr. William B. Goodman, Town of Whitestown, Re: NYSDEC approval to bury stockpiled petroleum soils in the landfill, March 30, 1990.

APPENDIX 2
SITE HISTORY

1963	Town of Whitestown begins purchasing land from William Nemyier.
1964	Town starts clearing land.
1967 (July)	Site officially opens for receiving solid waste.
1968 (February)	Site goes from open dump to a landfill.
1978 (February)	Town applies to NYSDEC for operating permit.
1978 (March)	Landfill operations permit approved.
1982 (October)	Landfill operations permit renewed.
1983 (December)	NYSDEC informs Town that landfill may contain hazardous substances.
1984 (December)	NYSDEC informs Town of inclusion in the State Registry of Inactive Hazardous Waste Disposal Sites.
1987 (October)	NYSDEC rescinds Town permit to operate landfill.
1988 (November)	Order on Consent No A6-0140-88-02 orders Town to cease operations by September 1, 1990.
1989 (August)	Phase I Remedial Investigation commences.
1990 (July)	Phase I Remedial Investigation Report submitted.
1990 (September)	NYSDEC Consent Order Amendment No. A6-0241-90-08 grants an operating extension to January 1, 1991.
1990 (October)	Phase II Remedial Investigation commences.
1990 (November)	Town awards contract to Stearns and Wheler for final cover design.
1990 (December)	Landfill operations cease.
1991 (March)	Draft RI report submitted.
1991 (April)	Final cover design approved by NYSDEC.
1991 (May)	Revised RI Report submitted.
1991 (December)	Revised Feasibility Study Report Submitted.

APPENDIX 3

Department of Environmental Conservation

Division of Hazardous Waste Remediation

Inactive Hazardous Waste Disposal Sites in New York State

Site List by Counties; Volume 6

- Herkimer
- Jefferson
- Lewis
- Oneida
- St. Lawrence

April 1992

A Joint Report
of the
New York State Departments of Environmental Conservation and Health

New York State Department of Environmental Conservation
MARIO M. CUOMO, *Governor* THOMAS C. JORLING, *Commissioner*

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS WASTE REMEDIATION
INACTIVE HAZARDOUS WASTE DISPOSAL REPORT

CLASSIFICATION CODE: 2 REGION: 6 SITE CODE: 633013
EPA ID: NYD000512731

NAME OF SITE : Whitestown Municipal Landfill
STREET ADDRESS: Shacksbury Road
TOWN/CITY: COUNTY: ZIP:
Whitestown Oneida 13492

SITE TYPE: Open Dump- Structure- Lagoon- Landfill-X Treatment Pond-
ESTIMATED SIZE: 50 Acres

SITE OWNER/OPERATOR INFORMATION:
CURRENT OWNER NAME....: Town of Whitestown
CURRENT OWNER ADDRESS.: 8 Park Ave., Whitesboro, NY
OWNER(S) DURING USE...: Town of Whitestown
OPERATOR DURING USE...: Town of Whitestown
OPERATOR ADDRESS.....: 8 Park Ave., Whitesboro, NY
PERIOD ASSOCIATED WITH HAZARDOUS WASTE: From 1967 To present

SITE DESCRIPTION:
This site is an active landfill for the Town. It had been thought that waste pesticides from the Bonide Chemical Co. were dumped at this landfill. Further investigation revealed that only the empty pesticide bags went in here. Recent information from the R-T-K survey has revealed that solvents and cyanides from local industries were disposed at this landfill however. Analysis of samples taken on the site have confirmed the presence of hazardous waste constituents. Inspections have been done at several houses in the vicinity. The inspections revealed that leachate had leaked into some of the basements.

The Town of Whitestown is currently conducting an RI/FS for the landfill in accordance with the terms of a Consent Order (CO) dated November 1988. The RI/FS field investigation was completed in December of 1990. The report preparation is proceeding at this time and a Record-of-Decision (ROD) is anticipated in early 1992.

An amendment was made to the Town's Consent Order which allowed them to extend the use of their landfill operation with the understanding that they must initiate the design of a final cover. The Town is also currently in the process of purchasing homes that were affected by the migration of leachate from the landfill.

HAZARDOUS WASTE DISPOSED: Confirmed-X TYPE	Suspected- QUANTITY (units)
Empty pesticide bags containing some residual pesticides	8000 pound/yr.
Solvents	3 tons
Cyanides	1 ton
TCE residues	700 lbs.

ANALYTICAL DATA AVAILABLE:
Air- Surface Water- Groundwater-X Soil-
Sediment-

CONTRAVENTION OF STANDARDS:
Groundwater-X Drinking Water- Surface Water- Air-

LEGAL ACTION:

TYPE..: Consent Order
State- X Federal-
STATUS: Negotiation in Progress- Order Signed- X

REMEDIAL ACTION:

Proposed- Under design- In Progress-X Completed-
NATURE OF ACTION: RI-FS and landfill capping

GEOTECHNICAL INFORMATION:
SOIL TYPE: Variable-glacial deposits
GROUNDWATER DEPTH: Variable

ASSESSMENT OF ENVIRONMENTAL PROBLEMS:

Groundwater contamination has been confirmed. Leachate has migrated into the basements of nearby residences.

ASSESSMENT OF HEALTH PROBLEMS:

All residences in the area utilize public water supplies. One residence proximal to the landfill remains impacted by leachate; the homeowner is currently negotiating with the Town for a buyout. There is a small potential for direct contact with leachate where it seeps into the roadside ditch and enters the wetlands area on the north side of NYS Rte. 69.

APPENDIX 4
RESPONSIVENESS SUMMARY
WHITESTOWN LANDFILL (SITE NO. 633013)
RECORD OF DECISION

Introduction

A responsiveness summary is required by New York State Department of Environmental Conservation (NYSDEC) policy as part of the Record of Decision (ROD) for the Whitestown Landfill Inactive Hazardous Waste Site. It provides a summary of citizens' comments and concerns received during the public comment period, and the NYSDEC's responses to those comments and concerns. All comments summarized in this document have been considered in NYSDEC's final decision for selection of a remedial alternative for the Whitestown Landfill site.

Summary of Comments

Comments on NYSDEC's Proposed Remedial Action Plan (PRAP), issued at the beginning of the public comment period, were received at a public meeting held at the Whitestown Town Hall, Whitesboro, on March 5, 1992, and in correspondence received during the public comment period. A transcript of the public meeting and copies of written comments received are included in the Administrative Record for the site (Appendix 1) and are available for public review. The public comment period extended from February 22 to March 23, 1992.

Commentors on the Whitestown Landfill PRAP included nearby residents, parents of children attending the Walbran Elementary School, local officials, an enviromental management council, the county health department, and other town citizens and industries interested in the site. The great majority of concern expressed was focused upon possible health effects from the landfill to nearby residents or students and personnel at the school. With the construction of the final landfill cover underway at the time of the public comment period, many questions focused on the nuisance and possible health effects of construction activities. A few questions and comments concerned the environmental consequences of the proposed remedy, and some concerned whether the proposed remedy was necessary and cost-effective. The concerns raised at the public meeting and in correspondence are summarized below, along with NYSDEC's responses. Issues pertaining to possible health effects have been addressed with assistance from the New York State Department of Health (NYSDOH).

Health Effects

1. What impacts has the site had or could the site have on the Walbran Elementary School? Has soil or surface water been sampled on school grounds?

Response: Any potential migration of landfill contaminants to the school would occur through the pathways of groundwater or air. Since the school has no

basement and groundwater has not been observed to discharge on the school grounds, the potential for human contact with groundwater is not a likely one. In addition, groundwater samples from wells on the school property did not contain compounds noted in the landfill wells. These wells were installed and sampled twice during the Remedial Investigation (RI). As discussed further below, unless soil or surface water was in contact with contaminated groundwater, it would not itself contain landfill contamination. The majority of surface runoff that may have contacted refuse does not flow onto school property, due to the presence of the ridge between the landfill and the school grounds. During the Remedial Investigation in 1990, only surface waters and soils with visible staining indicative of landfill-related groundwater contamination were sampled. Periodic sampling of monitoring wells on school property will be performed for a minimum period of 30 years after remedial actions are complete, and if groundwater seeps are noted on school property, seep water and soils will be sampled as well and addressed as needed.

As for airborne contaminants, air samples taken during the excavation of refuse, a worst-case condition for emission of landfill vapors and particulates, showed little or no exceedances of safe levels at the western landfill boundary. The prevailing wind direction is away from the school, which would provide further protection on many days of the year. The landfill cover, or cap, will control air emissions as discussed under Issue #2 below.

2. What kind of air monitoring and control is going to be implemented and will it be adequately protective of residents and the school?

Response: The final cover will contain a gas venting layer and one vent per acre to allow controlled release of landfill gas. Landfill gas is created by the decay of refuse and consists mostly of carbon monoxide and methane, with traces of non-methane organic compounds (NMOCs). NMOCs such as benzene or vinyl chloride in high concentrations may pose a long-term hazard to health. Even though above-ground air sampling to date has not shown significant levels of any NMOCs, because some high detections of NMOCs were noted in samples taken below the landfill surface, the vents on the landfill cover will be sampled after the cap is constructed to ensure that New York State guidance values for air quality are not exceeded at the landfill boundary. Long-term monitoring of the landfill will also include monitoring the levels of total NMOCs and methane on a periodic basis, both at the vents and at the boundary. The results of monitoring will be reviewed by the County and State health departments. If the landfill were shown to be emitting unacceptable concentrations of any NMOCs, the gas could be treated by placing carbon filters on the vents, or if necessary, connecting the vents to a blower and burning the gas. These methods of treatment would render the gas non-hazardous.

3. Can landfill-contaminated water seep into other basements than the one discussed in the PRAP?

Response: From the comments of other residents in the Route 69-Shacksbury Road area, their basements have never been infiltrated by groundwater over many years of varying water table elevations. If true, this circumstance alone suggests that leachate seeping into these basements has not yet and probably will not occur. The plan in the Department's selected remedy to intercept groundwater between the landfill and these homes will provide additional protection against this occurrence in the event that there was an unusually high water table.

4. Is soil and surface water around the landfill safe for use or daily exposure (e.g. gardening, sports, eating vegetables grown in the soil)?

Response: Soil and surface water not contacted by groundwater flowing from beneath the landfill does not contain landfill-related contaminants and therefore does not pose a health risk related to the landfill. Soils that are always above the water table, and surface water bodies not fed by groundwater seeps, are in this category. Visual evidence of landfill contamination, e.g. orange discoloration and odor, has not been observed west of the service station on Route 69, except for the backyard of one residence. The results of the Health Risk Assessment (March 1991) showed that accidental or casual skin contact, or even ingestion, of soils or surface water impacted by landfill chemicals results carries a low cancer risk (up to one in nine million) and no potential for other health effects. In addition, plants are not known to absorb the types of chemicals found in the leachate. While it is safe on that basis to plant a garden downgradient of the landfill, added assurance could be gained by planting in areas above the water table.

5. Is there a 30 year limit on site maintenance and monitoring? What will be done concerning the site after 30 years?

Response: New York State Solid Waste Management Regulations (6 NYCRR Part 360) specify that maintenance and monitoring must be conducted for a minimum of 30 years for a site such as a landfill. The State will review monitoring data periodically throughout the 30-year period and at the end of the period to determine how effectively the remedy is controlling and lessening the health and environmental threat of the site. If the threat cannot be shown to have been entirely and permanently eliminated, the maintenance and monitoring of the site will continue. If the remedy is shown not to be sufficient to abate the threat, additional controls will be added. Monitoring might also show that repair or replacement of a portion of the remedy is needed, in which case this would be performed.

6. Have there been studies of illness frequencies in the vicinity of the landfill?

Response: There are two considerations in addressing this question. First, no studies have been done by the State of illnesses in the area in connection with the landfill since generally such studies are performed <u>after</u> an exposure has been documented. No widespread exposure has been shown to exist to landfill contaminants (see response to Issues Nos. 1, 3, and 4 above); therefore the State has not pursued a survey of area residents for illnesses. Secondly, no study has ever been requested by concerned residents. A cancer study may be requested by residents of an area they suspect may have a high incidence of cancer. Interested residents may write to Aura Weinstein, Associate Director of Cancer Epidemiology, 565 Tower Building, Albany, New York 12237.

7. More monitoring wells are needed between the site and the school and residents.

Response: To meet State landfill closure requirements of spacing monitoring wells no further apart than five hundred feet in a downgradient area of a landfill, additional wells will be installed where needed between the school and the residents on Route 69 and the landfill. These wells will be monitored

periodically along with other site wells during the long-term monitoring period. Less stringent monitoring will be needed in areas downgradient of the groundwater collection trench, other than to confirm the effectiveness of the trench.

Cost-Effectiveness

8. Is the scope of the proposed cleanup warranted by the site risks? Is the remedy needed to fulfill State regulations for landfill closure?

Response: One commentor correctly pointed out that the RI/FS calculated, based on methods developed by the United States Environmental Protection Agency (USEPA), that there is no risk to human health from groundwater based on currently observed conditions and pathways of exposure. The Remedial Investigation results for landfill gas emissions were not conclusive as to whether a potential long-term health risk from landfill gas might exist; air sampling and modeling after completion of the final cover will be performed to determine whether additional gas controls are appropriate.

Notwithstanding the results of the Health Risk Assessment, to account for uncertainties in the risk-assessment process (such as the assumed amount of exposure to seeps) and possible future changes in composition of the groundwater, the policy of the DEC and DOH is to eliminate exposure to open groundwater seeps along Route 69 and at the affected residences through the selected remedy. The selected remedy is also needed to protect against future environmental impact. Contained in the landfill waste are contaminants which, if allowed to migrate to groundwater, could produce a future impact upon the wetland habitats north of Route 69 and regional groundwater resources. Allowing continued loading of landfill contaminants into the environment is not acceptable; therefore a final cover is needed to prevent continued generation of leachate from the landfill mass. Moreover, contaminants already leached from the waste and in groundwater directly beneath the site will continue to discharge to the environment. The DEC has made the judgment that immediate action to intercept and treat this contaminant pool is warranted since outbreaks of this groundwater flow into the Old Erie Canal and a protected wetland, carrying deleterious amounts of metals toxic to aquatic life. The decision to intercept the plume at this time is also based upon the apparent availability of a more cost-effective means to do so than previously identified in the Feasibility Study. Weighed against the uncertainty of possible health and environmental impacts from the leachate, and the cost of the additional study and extensive monitoring required to justify not intercepting the plume, the practical alternative is to implement collection of groundwater at the minimum rate necessary to eliminate the shallow groundwater seeps.

As to fulfilling State landfill closure regulations, these are applicable to the Whitestown site. A final cover meeting the specifications of 6 NYCRR Part 360-2.15, along with other closure requirements in Part 360, is considered the minimum remedy for the landfill. The final cover design for the Whitestown Landfill is more stringent than specified by Part 360, based on the need to protect the cover against settlement stress and long-term failure, as well as the lack of a man-made or natural liner beneath the waste to retard future migration of contaminants into groundwater.

9. Where else has capping been employed at similar sites and what has been the effectiveness of remediation at these sites?

Response: Capping has been employed at a large number of municipal landfills and industrial hazardous waste sites; however, none of these covers has, in general, been in place more than five years. For this reason, long-term data are not sufficient to demonstrate the actual effectiveness of caps in protection of groundwater. Impermeable covers are considered an effective technology for remediation due to laboratory and field tests demonstrating their ability to prevent rain and snowmelt infiltration into refuse, and hence transport of contaminants to groundwater.

10. How long will the cap last?

Response: Final landfill covers (caps) have not been in use long enough to make a judgment as to how long they endure against stresses of waste settlement, weathering, heat/cold, and so on. The design proposed for the Whitestown Landfill of a cap (over most of the site) combining clay and a synthetic membrane is one most likely to retain its effectiveness over time and is particularly recommended for landfills still undergoing settlement. In this type of cap, punctures in the membrane caused by stress are sealed by the clay immediately beneath while cracks in the clay are covered by the membrane, so that the deterioration over time of effectiveness of the impermeable barrier as a whole is greatly slowed. Also, where possible, repairs can be made to the cap to prolong its life. Again, little research is available to document the longevity of various cap designs, but the design proposed for the Whitestown site, based on short-term studies, shows the most promise for long-term integrity.

Landfill Cover Construction

11. Landfill cover construction activities have caused odors, nuisance situations and damage; how and when will these be addressed?

Response: Landfill cover construction is expected to be complete by November 1992. Odor problems experienced due to exposure of garbage to the air during the summer and fall of 1991 will not reoccur since waste excavation is finished. The potential for garbage odor will permanently cease once the cap is in place.

Other potential problems with construction include dust generation and noise. The construction contractor will employ methods similar to those used during highway construction, such as spraying water, to control dust. Construction activities are nearly always confined to daylight hours, so that noise at night would not be a nuisance. As with any construction project, damage to adjacent public or private properties through runoff, erosion, heavy equipment movement, ect. would be repaired by the construction contractor before completion of the job.

12. Has increased runoff that will occur once the landfill cover is complete be adequately handled by the final cover drainage design to a) prevent further erosion of the bluff and b) prevent runoff from flowing onto school grounds and private properties along Shacksbury Road?

Response: The drainage appurtenances for the final cover were designed using calculations of expected volumes of runoff from the cover from reasonable worst-case (25-year) storm events. The detention basin located on the south side of the landfill is designed to collect runoff from the cover and let it out at a slow enough rate not to overwhelm the existing drainage swales on Shacksbury Road and Route 69. Together with drainage improvements planned for Shacksbury Road, this system should effectively control runoff once completed.

Environmental Concerns

13. How is the proposed remedy protective of the Mohawk Valley Aquifer? How far would the plume be allowed to migrate before further action is taken? Plans for further action in the future, if needed, should be clear as to how, when and who will carry them out.

Response: The site remedy described in the March 1992 PRAP included a proposal to defer any groundwater collection and treatment until careful long-term monitoring showed a need. It was observed at that time that shallow seeps of groundwater carrying concentrated (due most likely to surface evaporation) amounts of metals and other landfill contaminants into the Old Erie Canal were minimal and could be controlled without groundwater collection. Worst-case conditions of high water table observed in the spring of 1992 suggest that the proposed solution in the PRAP is not workable and that shallow groundwater collection is a more protective long-term remedy and may be just as cost-effective over time as extensive monitoring of the uncontrolled plume.

The selected remedy does not, however, recommend complete collection of groundwater emanating from the landfill. Groundwater samples from immediately north of the landfill demonstrated that nearly all of the landfill contamination in groundwater is found at or near the water table. Deeper wells appeared to be clean or showed groundwater exceedances for regionally high constituents such as iron. Furthermore, downward migration of contaminants is limited by the aquitard found at a depth of approximately forty feet or more below the water table. The zone of groundwater bounded by the aquitard and the Old Erie Canal is considered unusable for domestic or public water due to the siltiness of the soils. The regional groundwater resource is shielded due to the presence of the aquitard and capture of nearly all of the contaminated groundwater presently by the Old Erie Canal, and upon implementation of the selected remedy, a shallow groundwater collection trench.

14. More monitoring wells are needed between the site and the Old Erie Canal.

Response: Yes, in areas where groundwater collection will not be implemented; however, groundwater collection will be implemented along nearly all the landfill-canal contact. The existing network of five shallow and three deep wells will be monitored to assess the effectiveness of the collection system.

15. Has the Oriskany Creek been sampled and is there a potential for impact on this stream?

Response: The Oriskany Creek was not sampled in the RI, but surveys of aquatic life discussed in the Habitat Based Assessment show the aquatic health of this stream to be good. The Creek is some distance west of the landfill (over a half-mile) and monitoring wells on the west site of the landfill, while showing higher concentrations of iron, manganese, zinc and copper than background wells at the site, did not contain the chlorinated hydrocarbon and ketone compounds associated with other landfill monitoring wells and the affected residences along Route 69.

Miscellaneous

16. Would DEC consider it safe to locate a landfill near a school today?

Response: Yes, because current landfill regulations address potential health and safety concerns in an effective manner. Much more exhaustive regulatory reviews are conducted of landfill applications than twenty years ago, and the affected public is given the opportunity to review an application. In addition, municipal landfills are restricted today from accepting hazardous wastes from industries; many municipalites have instituted collection programs for separate disposal of even household hazardous wastes.

17. Why did the landfill continue to operate for several years after the State determined the site needed action as a potential threat to the environment and human health?

Response: The threat as determined by DEC at the Whitestown Landfill came from disposal of industrial hazardous waste, not commercial or domestic refuse. Also there was at the time of the DEC's determination, and still is, a lack of available capacity for garbage disposal in the Town of Whitestown and in Oneida County. Due to this need for landfill capacity, and the lack of threat from continued landfilling of ordinary municipal waste, the DEC allowed an extension to the landfill's operation until such time as the Town could make arrangements for garbage disposal, or until a landfill remedy was selected.