TECHNOLOGY SECTION ⊘ Rod File

Department of Environmental Conservation

Division of Hazardous Waste Remediation

Gloversville Landfill

Site Number 518001
Fulton County, New York

Record of Decision

February 1994

Funded Under Title 3
of the
1986 Environmental Quality Bond Act

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

DECLARATION STATEMENT - RECORD OF DECISION

Gloversville Landfill Inactive Hazardous Waste Site
Town Of Johnstown, Fulton County, New York
Site No. 518001

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedial action for the **Gloversville Landfill** inactive hazardous waste disposal site which was chosen in accordance with the New York State Environmental Conservation Law (ECL) and consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 USC Section 9601, et., sec., as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA).

This decision is based upon the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the **Gloversville Landfill** Inactive Hazardous Waste Site and upon public input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A bibliography of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

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

Description of Selected Remedy

Based upon the results of the Remedial Investigation/Feasibility Study (RI/FS) for the **Gloversville Landfill** and the criteria identified for evaluation of alternatives the NYSDEC has selected **the extension of the city water supply to affected homes and the capping of the landfill.** The components of the remedy are as follows:

- **City Water to Residences including extending city water service to affected homes by encircling landfill along East Fulton Street Extension, Bemis Road, Blanchard Road, Blanchard Loop Road, Barker Road and Elmwood Avenue**
- **Landfill Cap including site regrading, waste consolidation, Part 360 cap with drainage net, draining adjacent beaver pond in the northeast, addressing infiltration from the borrow pit in the south and stormwater retention basins**

- **Site Monitoring including sampling soils, sediments, air, surface water and groundwater to assess changes in landfill impacts over time**
- **Public Awareness Program to increase public knowledge of the site's impacts**
- **Site Access Restrictions including fencing, warning signs and deed restrictions**
- **Groundwater treatment contingent on adequate groundwater and surface water quality improvement**

New York State Department of Health Acceptance

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

Declaration

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

The selected alternative does not fully meet all SCGs as contaminated groundwater is not being treated. As the waste mass desaturates, this groundwater discharge should diminish as little or no groundwater will be contacting the waste. Until that time, estimated at about 11 years, the contaminated groundwater will likely cause adverse impacts to the nearby surface water bodies. As monitoring of groundwater pursuant to Part 360 is integral to the selected alternative, a contingent remedy is proposed. If the groundwater and surface water quality does not show improvement, the remedy will be re-evaluated. This can include further evaluation of a groundwater pump and treat system to address continuing impacts to the environment.

This alternative requires recording of a Deed Restriction by the City of Gloversville in the Fulton County Clerks Office, NYSDEC approved institutional controls, and the notification and approval by the NYSDEC and the NYSDOH of a substantial change of use of the site.

February 14, 1994
Date

Ann Hill DeBarbieri
Deputy Commissioner

RECORD OF DECISION

Gloversville Landfill
Town of Johnstown, Fulton County, New York
Site No. 518001
February 1994

TABLE OF CONTENTS

SECTION	PAGE
SITE DESCRIPTION	1
SITE HISTORY	1
CURRENT STATUS	2
Summary of the RI/FS	2
Summary of Human Exposure Pathways	3
Summary of Environmental Exposure Pathways	4
ENFORCEMENT STATUS	4
SUMMARY OF REMEDIAL GOALS	5
SUMMARY OF THE EVALUATION OF ALTERNATIVES	5
Description of Remedial Alternatives	5
Evaluation of Remedial Alternatives	7
SUMMARY OF THE SELECTED ALTERNATIVE	10
HIGHLIGHTS OF COMMUNITY PARTICIPATION	10

Figures - Figure 1 Location Map
Figure 2 Site Sketch Map
Figure 3 Proposed Site Modifications
Figure 4 Proposed Water Main Routing

Appendices - Appendix A: Responsiveness Summary
Appendix B: Administrative Record

RECORD OF DECISION

Gloversville Landfill
Town of Johnstown, Fulton County, New York
Site No. 518001
February 1994

SITE DESCRIPTION

The Gloversville Landfill, Site # 518001 in Fulton County, is located on East Fulton Street Extension (Route 29A) in the Town of Johnstown (see Figure 1, Location Map and Figure 2, Site Sketch Map). The site is east of the City of Gloversville and north of New York State Route 29A. It occupies about 80 acres of a 175 acre parcel.

The surrounding area is largely rural with about 100 residences within one-half mile of the landfill. The City of Gloversville is located about three-quarters mile to the west. The area surrounding the landfill is densely wooded along the east, north and west sides. South of the site, private residences are located on East Fulton Street Extension beyond a wooded buffer area. The site slopes from south to north with highest elevation near the entrance to the landfill at Route 29A. The landfill itself consists of two terraces with the top relatively flat. Sand was excavated for cover material from a large open borrow pit immediately south of the landfill.

The area surrounding the landfill consists of relatively flat wetland areas and numerous glacially derived terraces and hills. Beaver ponds are located on the northeast and northwest borders of the landfill. The pond on the northeast flows into a tributary to the Anthony Creek. This tributary is dammed forming another beaver pond prior to flowing northwesterly to Anthony Creek. The pond on the northwest forms the headwaters of Anthony Creek. The Anthony Creek flows northeasterly to the Great Sacandaga Lake about three miles away.

SITE HISTORY

The Gloversville Landfill reportedly has been used for open refuse disposal from near the turn of the century. Disposal practices were upgraded to sanitary landfill procedures in 1958. The site accepted all wastes generated by the City of Gloversville and part of the Town of Johnstown. The landfill has received large amounts of sewage treatment plant sludge, domestic, commercial, industrial and tannery wastes.

In 1979, fish kills were reported due to leachate entering the beaver pond forming the headwaters of Anthony Creek. Inspection of the landfill operations noted leachate outbreaks and poor cover resulting in protruding waste and odors. The landfill was closed in July 1989 as required by a New York State

Department of Law Order on Consent. The Order on Consent required the City to remediate the Site. The City of Gloversville then applied for and was awarded an Environmental Quality Bond Act financial assistance agreement. This agreement partially funded Remedial Investigation/Feasibility Study (RI/FS) work at the Site.

Other investigations of the Gloversville Landfill which will be a part of the administrative record include a soil resource report prepared by the Soil Conservation Service for the City of Gloversville in December 1976; a September 1980 report prepared by Dunn Geoscience Corporation; SCS Engineers wrote a report titled Evaluation of Operations for the Planning Department of Fulton County in April 1981; and a Phase 1 Investigation of the Gloversville Landfill prepared by Wehran Engineering, P.C. in April 1986.

CURRENT STATUS

The City of Gloversville, under the State Title 3 Program, began a RI/FS in 1989 to address the contamination at the site. The purpose of the RI/FS was to define the nature and extent of any contamination at the site. The RI/FS was conducted in phases. Reports entitled, Remedial Investigation Report, dated 9/93 and Feasibility Study Report, dated 10/93, describe the activities of the RI/FS in detail.

Summary of the RI/FS

The RI/FS at the site included updating the maps of the site; a geologic study of the site area; an air survey; waste, soil and stream sediment sampling; surface water and groundwater sampling; flow measurements on Anthony Creek; private water well sampling; fish and wildlife studies and evaluation of the information collected to address the contamination at the site.

The top layer of soil; ie, the overburden, ranges in thickness from 10 to 70 feet. This layer is highly permeable allowing groundwater to move easily through it. Below the overburden is lodgement till and it ranges from 0 to over 65 feet thick. This is dense and clay rich and does not allow water to move through it easily. The till slows down the vertical migration of groundwater. Beneath this lodgement till lies bedrock, a brownish-dark gray shale called the Utica Shale.

The RI/FS showed the average waste thickness was 12 feet in the "inactive area" of the landfill. The waste in this area is largely mixed animal hides, leather scraps, glass and wood. This area is currently overgrown with brush and trees. The waste in the "active area" of the landfill is a mix of household, tannery, and demolition waste. This area is located in the central portion of the landfill where disposal continued throughout the 1980's. The depth of the waste in this area ranges from 70 to 80 feet thick.

The air survey showed inhalation hazards from air contaminants due to the Gloversville Landfill were not present. Five volatile organic compounds (VOCs) were found at concentrations well below Ambient Guideline Concentrations in site ambient air samples. Ambient particulate and chromium concentrations were also below applicable standards.

Contaminants were found at the Gloversville Landfill in leachate and surface and subsurface soils. The soils have little potential for direct migration as most are covered with either clean sand or

vegetation. These contaminants in the soils do have the potential to leach out over time if left exposed to the weather. The leachate is expected to migrate with the groundwater that passes through and under the site. At the waste disposal area, VOCs, semi-volatile organic compounds and metals were found in the leachate and soils. Chromium and ammonia nitrogen were commonly detected in the leachate. Additionally, pesticide compounds were found in the leachate, test pit samples and surface soil samples. Pesticide contamination has not migrated off-site. The chromium concentration in one of the Toxicity Characteristic Leachate Procedure (TCLP) samples from the "inactive" area exceeded toxicity characteristic limits. These limits were established by the EPA and indicate the refuse sampled is a characteristic hazardous waste.

Analysis of surface waters adjacent to the Gloversville Landfill showed little indication of VOC and semi-volatile organic contamination. Iron exceeded surface water standards at all sampling locations and zinc, aluminum, copper and lead exceeded standards less frequently. The un-ionized ammonia concentration was frequently found at concentrations exceeding surface water standards.

Most of the overburden groundwater flows to the northeast and discharges to the beaver ponds and the Anthony Creek. A smaller component of this groundwater flow enters the bedrock aquifer. The data show that the beaver ponds and surface water near the landfill are impacted by the landfill. Surface water standards were exceeded for metals and other inorganic compounds. Trace levels of VOCs were found in groundwater at six of the groundwater monitor wells. Two of these wells exceeded groundwater standards for benzene. VOC concentrations above groundwater standards were found in a monitoring well in the northeast corner of the waste disposal area. Semi-volatile organic contamination of groundwater appears limited to this area as well. Iron, aluminum, chromium, lead and manganese were found at concentrations above groundwater standards. Barium was found consistently above background levels and sodium concentrations were elevated in many of the deep groundwater monitor wells. Ammonia nitrogen concentrations exceeded groundwater standards in many of the shallow and bedrock monitor wells.

In general, the bedrock groundwater flows northeast. Downgradient bedrock wells have been shown to be impacted by the landfill derived contaminants. Contaminant movement in the bedrock aquifer is nearly exclusively through fractures believed to trend northeast-southwest along the bedrock lows. These fractures cause the primary flow toward the northeast. Data also show that contaminants are moving in bedrock to the southeast in the southeast corner of the landfill. This may be occurring primarily in the fractured uppermost portion of the bedrock. The flow here may follow the bedrock surface which slopes to the southeast. Continued migration to the southeast may be through secondary fractures that exist perpendicular to the primary northeast-southwest trend.

Summary of Human Exposure Pathways

The data indicate a contaminant plume is moving away from the landfill. Both landfill groundwater monitoring and private drinking water wells showed a pattern following the groundwater flow for sodium, barium and ammonia. These analytes, while not presently contributing to adverse effects, may be precursors to the migration of additional contaminants. Sodium concentrations exceeding groundwater standards were found in many of the private wells. Ammonia nitrogen concentrations exceeding groundwater standards were found in a few of the private wells. Barium was found in several private wells indicating an influence from the landfill but at levels below drinking water standards.

A baseline risk assessment was done to evaluate the impact of the contamination at the

Gloversville Landfill. Its goal was to assess whether actual or threatened releases of hazardous substances pose potential risks to human health. Possible pathways of exposure for those who may be on the site itself were identified. These included inhalation hazards associated with breathing contaminated dust or vapors from the site; and skin contact hazards or ingestion hazards associated with touching and inadvertent swallowing of soils, sediments, leachate, surface water or groundwater contaminated by the site. Possible pathways of exposure for those off-site include skin contact hazards or ingestion hazards associated with touching and inadvertent swallowing of sediments, leachate, surface water or groundwater contaminated by the site. These are all possible routes of exposure from the site. The baseline risk assessment identified drinking groundwater as the most probable route of exposure contributing to human health risk from the site. Details of the risk assessment are found in the RI/FS in Chap. 6.

Summary of Environmental Exposure Pathways

An ecological assessment was also done to determine potential impacts to nonhuman receptors exposed to chemicals of concern. The approaches used in the ecological assessment are similar to those used for the human health risk assessment. Potentially exposed receptors are identified, and information on exposure and toxicity is combined to assess potential impacts. Little data is available to evaluate so a quantitative risk assessment was not done. Instead, a comparison of contaminant concentrations to standards and criteria was done. The results of the ecological assessment are: the surface water aquatic life of the eastern tributary to Anthony Creek are seriously impacted from the landfill; macroinvertabrates at downstream locations in surface water are impacted near the landfill and showed signs of recovery further downstream; some metals exceed acute and/or chronic toxicity levels for surface water at the northeast of the site; some metals exceed acute and/or chronic toxicity levels in site groundwater; the surface water ammonia concentration found is significantly higher than the Ambient Water Quality Criteria as established by USEPA; the surface water ammonia concentration found is adversely affecting the fish population; the bio-assay study showed the contaminants in the Anthony Creek were sufficiently diluted about 0.5 miles downstream; and adverse impacts to plants and terrestrial wildlife are unlikely.

In summary, the data show a contaminant plume although most contaminants are not moving from the landfill at high concentrations. Based on the hydrogeologic study, and supported by chemical data, this plume appears to primarily discharge to surface water. This groundwater discharges through preferred flow channels to Anthony Creek and the northeast beaver pond adjacent to the landfill. A portion of the groundwater flow passes beneath the beaver pond and probably discharges to the next pond or to Anthony Creek. The site, if left as it is, poses a human health threat through drinking of groundwater from off-site contaminant migration. Site environmental risks seem limited to impacts to surface water aquatic life in the Anthony Creek's eastern tributary. Neither plants nor terrestrial wildlife seemed to be adversely impacted as a result of the landfill.

ENFORCEMENT STATUS

The Gloversville Landfill work is being done pursuant to a 1989 Order on Consent by the New York State Attorney General. This Order on Consent allowed the City of Gloversville to apply for assistance under the Environmental Conservation Law Title 3 Bond Act of 1986. The Title 3 Bond Act provides up to 75% reimbursement to the City for eligible remedial costs of the RI/FS. It is expected the City will apply for further assistance for the design and implementation of the remedial action.

SUMMARY OF REMEDIAL GOALS

Goals for the remedial program were established using the remedy selection process stated in 6NYCRR 375-1.10. These goals, established under the guideline of meeting all standards, criteria and guidance (SCGs) and protecting human health and the environment, include:

- Reduce, control, or eliminate the generation of leachate within the fill mass.
- Eliminate the threat to surface waters by eliminating any future contaminated surface run-off from the contaminated soils on site.
- Eliminate the potential for direct human or animal contact with the contaminated soils on site.
- Prevent to the extent possible,migration of contaminants in the landfill to groundwater.
- Provide for attainment of SCGs for groundwater and surface water quality at the limits of the area of concern.

SUMMARY OF THE EVALUATION OF ALTERNATIVES

Description of Remedial Alternatives

Potential remedial alternatives for the Gloversville Landfill were identified, screened and evaluated in the RI/FS. The potential remedies are intended to address the contaminated solid waste, soils, leachate, surface water and groundwater at the site. Four alternatives were subject of a detailed analysis. These alternatives were assembled to provide options with respect to cost and their effectiveness at reducing human health and environmental risk. A summary of the detailed analysis follows.

Alternative No. 1: No Action

- Site Monitoring including sampling soils, sediments, air, surface water, groundwater and private wells to assess changes in landfill impacts over time
- Public Awareness Program including meetings and informational documents to increase public knowledge of the site's impacts
- Present Worth Cost $3,030,000
- Capital Cost $ 190,000
- Annual O&M Cost $ 229,000
- Time to Implement Immediate

This alternative is evaluated as a statutory requirement and as a basis for comparison. It requires public information and continued monitoring only, allowing the site to remain in its existing state.

Alternative No. 2: Limited Action

- Site Monitoring
- Public Awareness Program
- Site Access Restrictions including fencing, warning signs and deed restrictions

- City Water to Residences including extending city water service to affected homes by encircling landfill along East Fulton Street Extension, Bemis Road, Blanchard Road, Blanchard Loop Road, Barker Road and Elmwood Avenue
- Present Worth Cost $5,210,000
- Capital Cost $3,550,000
- Annual O&M Cost $ 134,000
- Time to Implement 18 - 24 months

This alternative provides a reduction in current landfill based risks from direct site exposure and affected private water wells. It is identical to Alternative Number 1: No Action, except installing the water line makes monitoring of private wells unnecessary.

Alternative No. 3: Impermeable Cap/City Water Line

- Site Monitoring
- Public Awareness Program
- Site Access Restrictions
- City Water to Residences
- Landfill Cap including site regrading, waste consolidation, Part 360 cap with drainage net, draining adjacent beaver pond in the northeast, addressing infiltration from the borrow pit in the south and stormwater retention basins
- Present Worth Cost $28,340,000
- Capital Cost $25,950,000
- Annual O&M Cost $ 193,000
- Time to Implement 24 - 36 months

This alternative provides the same health based risk reductions as Alternative No. 2. By capping the landfill, it provides added reduction in contaminant loading to the groundwater and surface water by reducing leachate production. All other elements are similar to Alternative Number 2: Limited Action.

Alternative No. 4: Impermeable Cap/City Water Line/Groundwater Pump and Treat

- Site Monitoring
- Public Awareness Program
- Site Access Restrictions
- City Water to Residences
- Landfill Cap
- Groundwater Pump and Treat System to intercept the migrating plume
- Present Worth Cost $44,510,000
- Capital Cost $31,950,000
- Annual O&M Cost $ 1,012,000
- Time to Implement 24 - 36 months

This alternative provides all the risk reductions associated with Alternative No. 3. In addition, it actively treats off-site groundwater near the landfill through groundwater pumping with treatment of the pumped water. This system, in effect, stops any additional contaminant plume migration off-site in the overburden.

Evaluation of Remedial Alternatives

The remedial alternatives have been compared against the criteria identified in the NYSDEC's Technical and Administrative Guidance Memorandum (TAGM) Number 4030, "Selection of Remedial Actions At Inactive Hazardous Waste Sites". A detailed discussion of the evaluation criteria and the comparative analysis is contained in the Feasibility Study Report. The following is a brief summary of the comparative analysis contained in the RI/FS.

The first two criteria are termed threshold criteria. Each alternative evaluated at this stage must satisfy these two criteria to be eligible for selection as a remedy.

1. Protection of Human Health and the Environment. This criteria is an overall assessment of protection based on a composite of all other evaluation criteria.

Alternative Number 1: No Action does not provide any additional protection over existing conditions which are adversely impacting both groundwater and surface water. Alternative Number 2: Limited Action provides protection against drinking contaminated groundwater by supplying city water in place of private wells. It also provides partial protection from exposure to contact with contaminated soils by limiting access with fencing. Alternative Number 3: Impermeable Cap/City Water Line provides similar protection as Alternative Number 2 from drinking contaminated groundwater. It provides additional protection from exposure due to contact. It also minimizes additional generation of contaminated groundwater by reducing infiltration and percolation through the landfill by capping the site. Alternative Number 4: Impermeable Cap/City Water Line/Groundwater Pump and Treat provides similar protection in all categories as Alternative Number 3. It additionally collects contaminated groundwater for treatment to reduce the discharge of contaminants to the surface water.

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

Due to the Landfill's size and the extent of groundwater contamination off-site, meeting all SCG's is impossible currently. The waste mass cannot be treated to completely eliminate a continuing source of contamination. Partial attainment of some SCG's, such as surface water and groundwater standards, using current technology will minimize the site's adverse impacts.

Alternative Number 1: No Action does not meet any SCGs as it leaves the site in its present condition. The site's present condition is adversely impacting both human health and the environment. Alternative Number 2: Limited Action only meets drinking water standards by replacing private wells with city water. Alternative Number 3: Impermeable Cap/City Water Line meets drinking water standards similarly as in Alternative Number 2. It also partially meets surface water and groundwater standards and guidance by reducing infiltration and percolation through the landfill. Alternative Number 4: Impermeable Cap/City Water Line/Groundwater Pump and Treat provides similar attainment of SCGs as Alternative Number 3. It further partially meets surface water and groundwater standards and guidance due to the collection of contaminated groundwater.

The next five "primary balancing criteria" compare the positive and negative aspects of the remedial alternatives against each other.

3. Long-term Effectiveness and Permanence. As wastes will remain on site after the selected remedy has been implemented, the following need to be evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the controls intended to limit the risks, and 3) the reliability of these controls.

Alternative Number 1: No Action does not provide any reduction in existing risk from the site. Alternative Number 2: Limited Action does not reduce risk at the site but merely limits access to the site with fencing. It does reduce risk from drinking contaminated groundwater by replacing private well water with city water. The city water supply effectively reduces the risk from drinking contaminated groundwater over the long term. Alternative Number 3: Impermeable Cap/City Water Line provides similar reduction in risk due to ingestion of contaminated groundwater as in Alternative Number 2. It provides additional long term reduction in risk at the site from capping reducing exposure to contaminated soils. It also reduces risks from contaminated surface water and groundwater as the cap minimizes the infiltration and percolation through the landfill. The effectiveness of the city water line is similar to Alternative Number 2. The cap effectively reduces infiltration and percolation through the landfill by about 98 percent, consequently, generation of contaminated groundwater is reduced. The city water supply and the cap are reliable long term controls. Alternative Number 4: Impermeable Cap/City Water Line/Groundwater Pump and Treat provides similar reduction in risk as Alternative Number 3. It further reduces contaminated groundwater by collecting groundwater for treatment to reduce contaminants moving off-site. The effectiveness and reliability of Alternative Number 4 over the long term is similar to Alternative Number 3.

4. Reduction of Toxicity, Mobility or Volume. The remedy selection process gives preference to alternatives that permanently reduce the toxicity, mobility or volume of the site's wastes.

Alternative Number 1: No Action does not change existing conditions which adversely impact both groundwater and surface water as the waste is not treated. Alternative Number 2: Limited Action is similar to alternative Number 1 as it does not change the existing conditions of the wastes. Alternative Number 3: Impermeable Cap/City Water Line provides reduction in contaminant mobility from the placement of the cap which effectively limits the transport of wastes through groundwater. It does not reduce either the toxicity or the volume of the wastes present at the site. Alternative Number 4: Impermeable Cap/City Water Line/Groundwater Pump and Treat provides additional reduction in mobility by collecting contaminated groundwater. No treatment the wastes is performed so there is no reduction in toxicity or volume. This alternative provides for collection of groundwater for treatment and reduces the discharge of contaminants to the surface water. The treatment of the contaminated groundwater produces residuals which need proper disposal.

5. Short-term Impacts and Effectiveness. This criterion compares the adverse impacts to the community, remedial workers and the environment resulting from each remedy. The time necessary to complete each remedy is considered in comparing the time associated with the adverse impacts.

Alternative Number 1: No Action does not present any significant adverse short-term impacts as it leaves the site in its present condition. Alternative Number 2: Limited Action is similar to Alternative Number 1 in not presenting any significant adverse impacts even though it provides for the installation of fencing and a water main. These additional construction activities are primarily away from the contaminated areas. The time to install the remedy would take about 18 - 24 months. Alternative Number 3: Impermeable Cap/City Water Line presents the potential for adverse impacts due to the construction activities necessary to implement this alternative. The impacts from the installation of the fence and water line are similar to Alternative Number 2. Impacts from the waste consolidation and capping activities

require health and safety measures protective of workers, the public and the environment. Dust control, stormwater runoff and air monitoring are examples of these measures to mitigate any adverse impacts from the installing this alternative. This alternative would take about 24 - 36 months to implement. Alternative Number 4: Impermeable Cap/City Water Line/Groundwater Pump and Treat, essentially consists of the same construction activities as Alternative Number 3, has similar impacts to workers, the public and the environment. The time frame to install this alternative is also similar to Alternative Number 3 and would take about 24 - 36 months.

6. Implementability. This criterion compares the technical and administrative difficulties in implementing each alternative.

Alternative Number 1: No Action is easily implemented as there is no construction activity and most work is administrative in nature. Alternative Number 2: Limited Action is similar to Alternative Number 1 as there is only little added construction activity from the fencing and water line installation. The tasks for establishing a water district and for satisfying the criteria of the Gloversville Board of Water Commissioners add administrative difficulty. Alternative 3: Impermeable Cap/City Water Line involves more extensive construction activities than either Alternative Number 1 or Alternative Number 2 which increases the difficulty to implement this alternative. The additional construction activities are on-site and are standard construction activities so they should not increase the technical difficulty significantly. Alternative 4: Impermeable Cap/City Water Line/Groundwater Pump and Treat essentially consists of standard construction activities as in Alternative Number 3, also is similarly technically implemented. Obtaining a surface water discharge permit and disposing the treatment residuals from the groundwater pump and treat system adds administrative difficulty.

7. Cost. The total cost for each alternative is compared on a 30 year present worth basis. The present worth cost includes capital cost and operation and maintenance (O&M) cost.

The costs of the four alternatives are shown in the following table.

Cost Element	Alternative No. 1	Alternative No. 2	Alternative No. 3	Alternative No. 4
Present Worth	$3,030,000	$5,210,000	$28,340,000	$44,510,000
Capital	$ 190,000	$3,550,000	$25,950,000	$31,950,000
Annual O&M	$ 229,000	$ 134,000	$ 193,000	$ 1,012,000

8. Community Acceptance. This criterion evaluated the community concerns regarding the RI/FS report and this PRAP. A "Responsiveness Summary" was prepared that describes public comments received and how the NYSDEC addressed the concerns. The Responsiveness Summary is attached as Appendix A.

SUMMARY OF THE SELECTED ALTERNATIVE

This ROD presented four potential alternatives to address the conditions present at the Gloversville Landfill. The alternatives provide options available to protect human health and the environment at varying cost. The only alternatives which meet the threshold criteria are Alternative Number 3 and Alternative Number 4. Alternative Number 3 provides similar long term effectiveness and reduction of toxicity, mobility and volume as Alternative Number 4. Both Alternative Number 3 and Alternative Number 4 have similar short term impacts and are readily implemented. Alternative Number 3 is significantly lower in present worth cost than Alternative Number 4. Based upon this evaluation, the selected remedy is Alternative Number 3: Impermeable Cap/City Water Line as it minimizes the risk to human health by providing city water to affected properties and eliminating contact with contaminated soils by capping the landfill; it reduces the adverse impacts to the environment by minimizing additional generation of contaminated groundwater by capping the site to reduce infiltration and percolation through the landfill; it maximizes attainment of SCGs and retards the mobility of the waste using current technology; the degree of difficulty implementing the remedy is no more than standard construction practice and it is a cost effective remedy (See Figure 3, Proposed Site Modifications and Figure 4, Proposed Water Main Routing).

The selected alternative does not fully meet all SCGs. It does not treat the waste which continues the discharge, ongoing for decades, of contaminated groundwater. As the waste mass desaturates, this discharge should diminish as little or no groundwater will be contacting the waste. Until that time, estimated at about 11 years, the contaminated groundwater will likely cause adverse impacts to the nearby surface water bodies. As monitoring of groundwater pursuant to Part 360 is integral to the selected alternative, a contingent remedy is proposed. If the groundwater and surface water quality does not show improvement, the remedy will be re-evaluated. This can include further evaluation of a groundwater pump and treat system to address continuing impacts to the environment.

This alternative requires recording of a Deed Restriction by the City of Gloversville in the Fulton County Clerks Office, NYSDEC approved institutional controls, and the notification and approval by the NYSDEC and the NYSDOH of a substantial change of use of the site. This Deed Restriction will meet the requirements set forth in 6NYCRR Part 375-1.6 as promulgated in May of 1992.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

The community participation activities carried out for the Landfill complied with the Department's statewide citizen participation plan. Some of the activities for this project exceeded the statewide plan's minimum requirements. Public meetings on workplans and document availibity notices were additional activities carried out to increase the public's site knowledge.

A listing of the community participation activities include:

- newspaper notice of RI/FS workplan availibity and public meeting
- mailed notice of public meeting on RI/FS workplan
- public meeting on the RI/FS workplan

- mailed notice of RI/FS workplan responsiveness summary and citizen participation plan availibility

- mailed notice of public meeting on Phase I RI/FS Report

- public meeting on the Phase I RI/FS Report

- mailed notice of Phase I RI/FS Report addendum and Phase II RI/FS workplan availibility

- mailed notice of public meeting on Proposed Remedial Action Plan

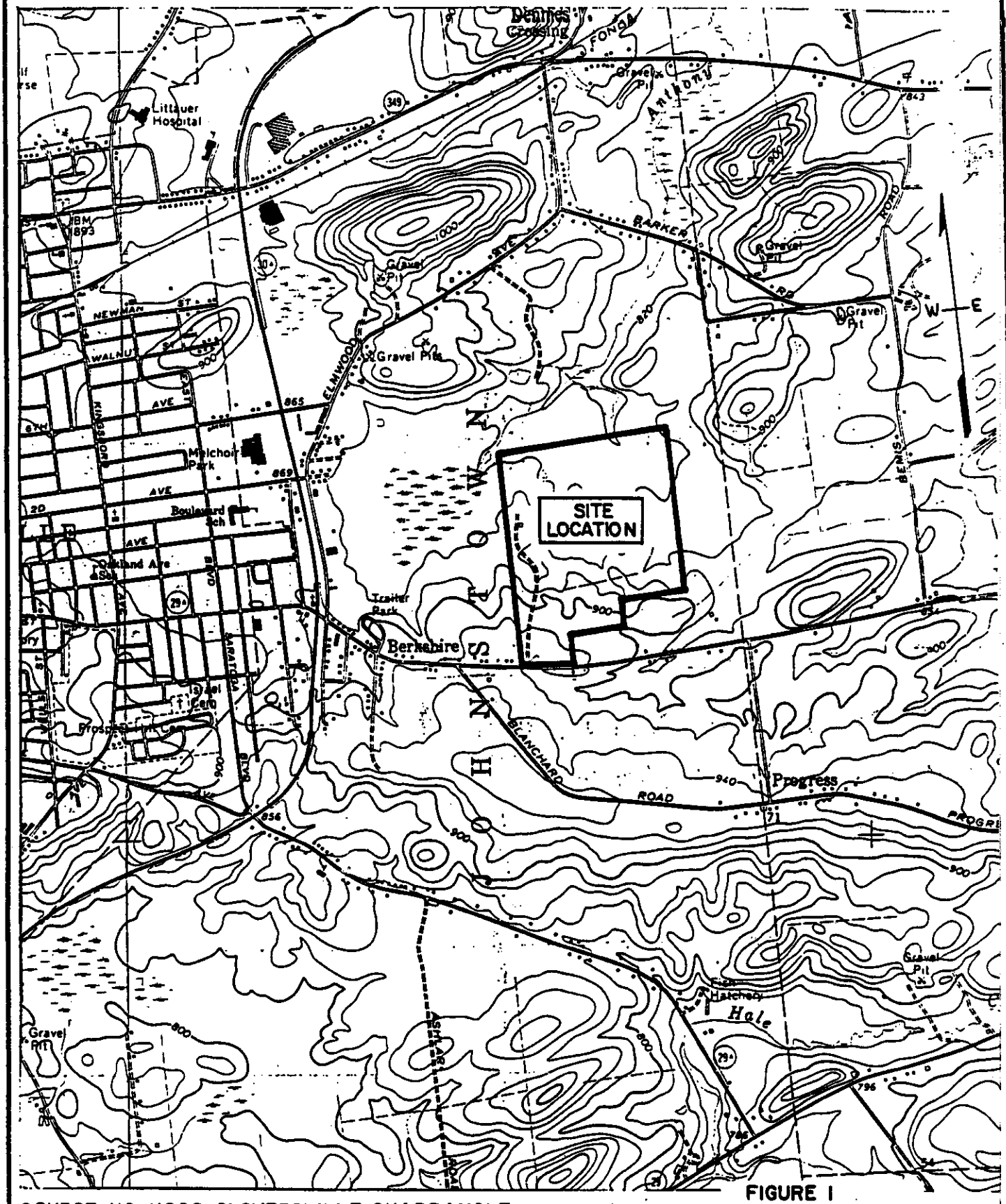


FIGURE 1

SOURCE NO. USGS GLOVERSVILLE QUADRANGLE

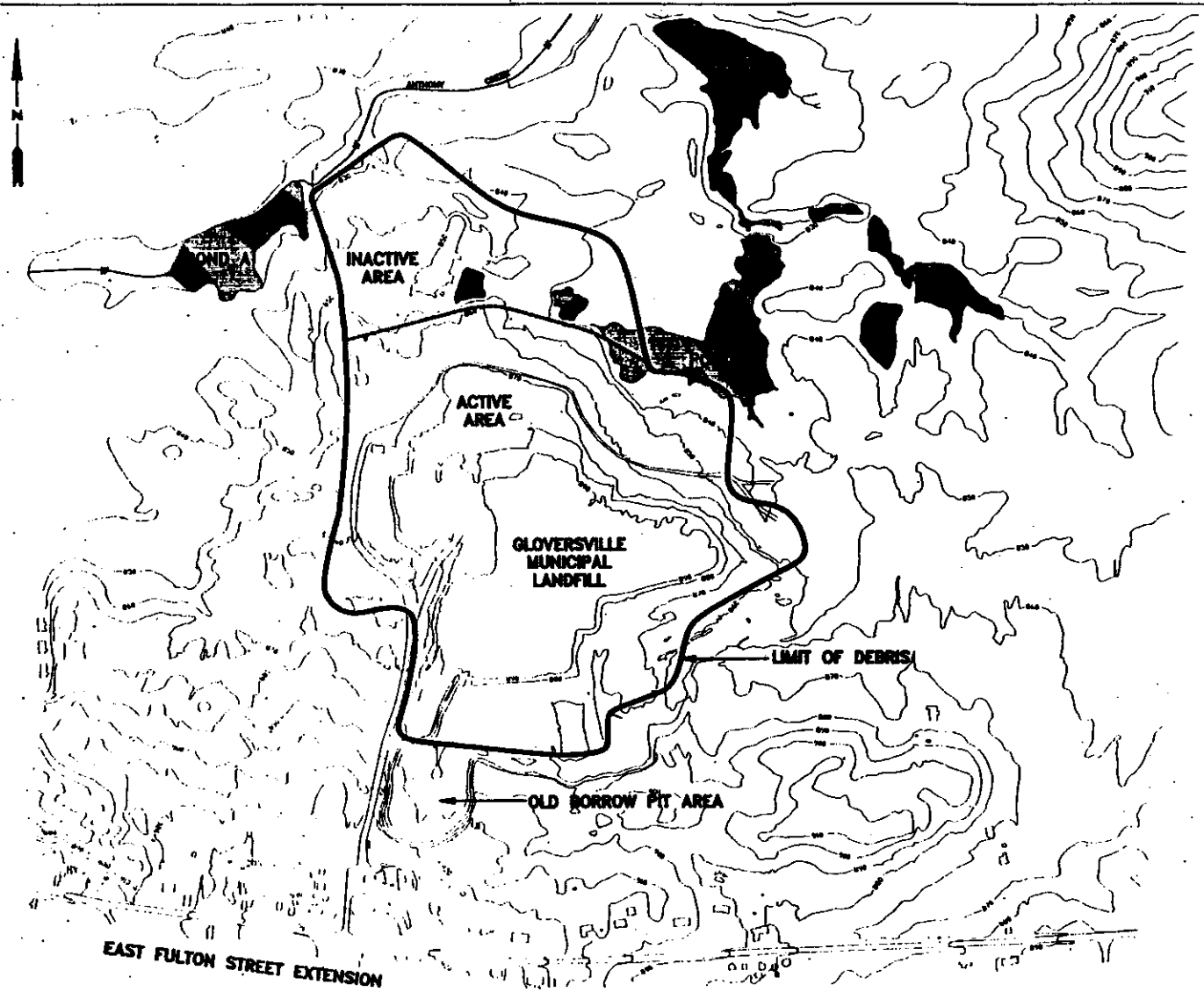
NYSDEC SITE NO: 518001

LOCUS PLAN

MUNICIPAL SANITARY LANDFILL
GLOVERSVILLE, N.Y.

TIGHE & BOND INC. CONSULTING ENGINEERS
WESTFIELD, MASS.

SCALE: 1"= 2000' DATE: OCT. 1992



NYSDEC SITE NO:518001

DRAWN BY: EJK	CHECKED BY: EJK/MB	APPROVED BY: MBP

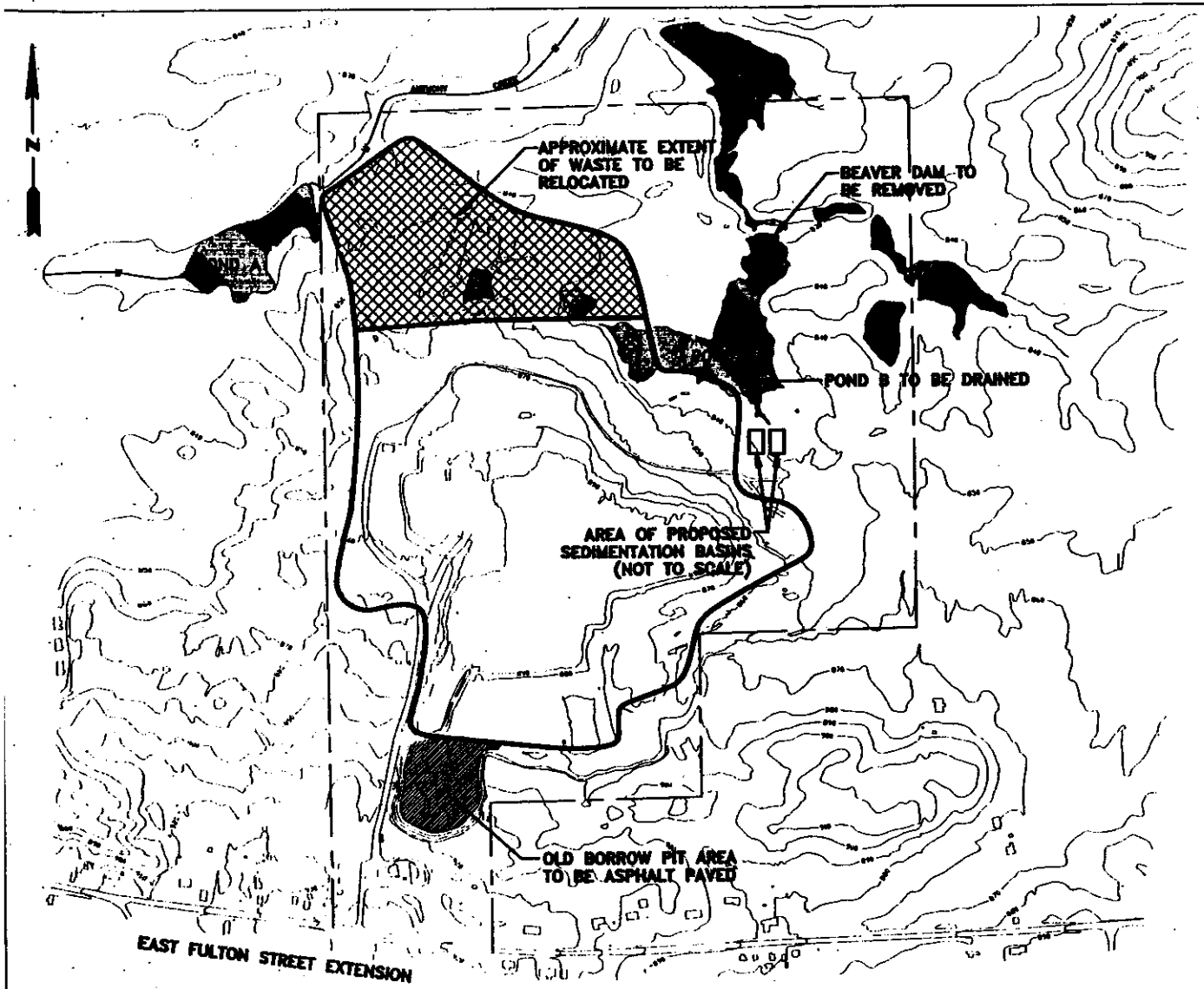
NO.	DATE	REVISIONS	BY
1	4/93	CORRECT ACCESS LINE, ADD ACTIVE/INACTIVE AREAS	TMB

TICHE & BOND
CONSULTING ENGINEERS, P.C.
WESTFIELD, MASSACHUSETTS

SITE PLAN

REMEDIAL INVESTIGATION/FEASIBILITY STUDY
GLOVERSVILLE MUNICIPAL LANDFILL
GLOVERSVILLE, NEW YORK

DATE: NOV., 1992
SCALE: 1" = 400'
FIGURE: 2



LEGEND

— — — PROPERTY LINE

——— LIMIT OF DEBRIS

NYSDEC SITE NO: 518001

NO.	DATE	REVISIONS	BY
1	4/93	CORRECT BORING LOC, AND AREA TO BE RELOCATED	TMB

TIGHE & BOND
CONSULTING ENGINEERS, P.C.
WESTFIELD, MASSACHUSETTS

PROPOSED SITE MODIFICATIONS

REMEDIAL INVESTIGATION/FEASIBILITY STUDY
GLOVERSVILLE MUNICIPAL LANDFILL
GLOVERSVILLE, NEW YORK

DATE: NOV., 1992
SCALE: 1"= 400'
FIGURE: 3

b0101\f11b

FIGURE 4

SOURCE: USGS GLOVERSVILLE QUADRANGLE

WATER MAIN ROUTE

AREA OF IMPACTED PRIVATE WELLS

NYSDEC SITE NO: 518001

PROPOSED WATER MAIN ROUTING
MUNICIPAL SANITARY LANDFILL GLOVERSVILLE, N.Y.
TIGHE & BOND INC. CONSULTING ENGINEERS WESTFIELD, MASS.
SCALE: 1"= 2000' DATE: OCT. 1992

APPENDIX A

RESPONSIVENESS SUMMARY
GLOVERSVILLE LANDFILL
SITE NUMBER 518001, FULTON COUNTY

Water Supply Questions

Q. Will a booster pump be needed to deliver adequate flow for the proposed water supply?

A. During the preparation of the Feasibility Study, a brief evaluation of available water pressure within the Gloversville water distribution system was made. Based on the existing pressure information, static and dynamic pressure losses in the proposed system were calculated to determine the adequacy of the system. The comments provided by the Board of Water Commissioners indicates that a similar, but more in depth, analysis was performed by their consultant. They used fire flow test results to determine available static and residual pressures and have determined it will be necessary to boost pressure to provide adequate fire flows on the proposed water line. They have indicated that the additional cost for a booster pump station is approximately $400,000.
The actual need and sizing for booster pumping equipment will be addressed during design. This additional capital cost is within the tolerances of the Feasibility Study cost estimates. It does not need to be added to the capital cost of the water line portion of the recommended alternative.

Q. What are the consequences if a homeowner decides not to connect to the public water supply at the time it is installed?

A. The State believes the public water supply is the best protection from drinking groundwater contaminated from the site. A homeowner in the impacted area using well water rather than the public water supply is responsible for their decision.

Q. If affected homes do not connect to the public water supply now, will it cost more to connect in the future?

A. The State contributes to the connection cost only for affected homes at the time the project is EQBA funded. It is likely costs will be higher without State assistance.

Q. Can the Department decide who will pay for the public water supply usage?

A. The Department only selects the best remedial action and does not have

authority to decide who pays for water usage.

Q. What will the water line routing be?

A. The water line route is proposed to encircle the Landfill. The route will begin at the city line and extend along East Fulton Street Extension (Route 29A) on to Bemis Road on to Blanchard Road on to Barker Road on to Elmwood Avenue back to East Fulton Street Extension. A line is also proposed on Blanchard Loop Road between Blanchard Road and Barker Road.

Q. When the water line is installed, will the drinking water wells be capped to prevent further use?

A. The drinking water wells will not be capped. The houses which connect to the water line will be disconnected from wells to avoid cross-contamination.

Q. What will be the cost to the homeowner for using public water?

A. The current rate usually charged to users outside of the City of Gloversville is 2.5 times the rate charged within the city. The Gloversville Board of Water Commissioners is offering the same rate charged to city users for those homes in the impacted area. This rate is only available if the home is connected at the time of construction.

Q. What type of water district will be formed? Will it be a water district or a permissive use district?

A. A water district is formed when a town is responsible for the operation and maintenance of the water supply. A permissive use district is formed when a water authority is responsible for the operation and maintenance of the water supply. In this case, the Gloversville Board of Water Supply will be responsible for operation and maintenance of the water supply. This means a permissive use district will need to be formed. In either case, consent from expected users is needed to form the necessary district.

Q. Will houses be required to connect to the public water supply line?

A. The connection is not required whether a house is located in the impacted area or not.

Q. Is the public water supply line cost effective ?

A. The public water supply was selected after comparing alternatives which

would eliminate the threat from drinking contaminated groundwater. Another alternative which was considered was supplying filters to impacted houses. This alternative was as costly as the public water supply and it had a major drawback. The drawback was the filters needed to be monitored to make sure they were working. Without adequate monitoring, users could be exposed to contaminated groundwater and this was considered unacceptable. To provide a satisfactory degree of protection, the monitoring cost for filters became significantly higher.

Q. When was the last time residential wells were tested? My well was never tested. Will wells be tested again?

A. The New York State Department of Health has been testing the residential wells since 1985. The last time residential wells were tested was in February of 1992. The residential wells which were tested were selected to represent typical wells in the area. Some wells were not tested because other wells tested in the area were similar in construction, depth and yield. No additional sampling of wells is expected.

Proposed Remedial Action Questions

Q. Are there waivers of the standards, criteria and guidance?

A. Waivers of the standards, criteria and guidance are covered in the Department's regulations in Part 375. These waivers are allowed for certain conditions. These include: when the project is only part of the complete project; when applying a standard results in greater risk; when achieving the goal is impracticable; or when another method achieves the same goal. It is impossible to meet all standards, criteria and guidance for this project with current technology. Partial attainment of some SCG's will minimize the site's adverse impacts.

Q. There is the use of terms like "detected significantly below" and "may be contaminating" in the Proposed Remedial Action Plan. Considering the Landfill has been closed since July 1989, how is anything going to be more toxic in the future if it doesn't seem that bad now? Is it worth it to cap the landfill if there is not that big a problem?

A. The investigations showed there is a contaminant plume migrating away from the landfill. This plume is not contributing to any drinking water standard violation but is likely to in the future. The reason for this is the groundwater near the landfill does violate drinking water standards. This contaminated groundwater will move towards the homeowner wells and cause private wells to exceed drinking water standards. The contaminant plume is already damaging the environment in the ponds and Anthony Creek. It has been shown that fish and macroinvertabrates (for example, flies, insects and worms) are unable to live in parts of these waters. The cap should reduce the contaminant plume to allow the surface water and groundwater to improve in quality.

Q. What triggered the recommendation to cap the landfill?

A. The Landfill's current conditions are causing threats to human healt and the environment. These threats include contacting contaminate landfill soils and waste, drinking contaminated groundwater an contaminated groundwater contaminating surface water. Standards criteria and guidance were reviewed to find out the best way to contro these threats. This process evaluated treatment methods, engineerin controls and institutional controls available to eliminate or mitigat the site's threats. Of the four alternatives passing the screenin process, Alternative 3's capping technology is protective and bes balances the evaluation criteria. There was no one trigger that cause this selection.

Q. Has Alternative Number 3: Impermeable Cap/City Water Line been selected

A. A remedy will not be chosen by the State until review of all comment submitted during the public comment period. The Proposed Remedia Action Plan is issued to allow comment on the preferred remedy. Afte analyzing the comments received, the State will issue a Record o Decision identifying the selected remedy. The State will then see i the responsible parties will proceed with the remedial action. The Cit must sign an Order on Consent if it wants to use EQBA monies to proceed with the remedy. If none of the responsible parties proceed with th remedy, the State can proceed with State Superfund monies. The Stat will attempt legal recovery of money it spent for the remedy fro responsible parties who did not help.

Q. Were the Risk Assessment input parameters reasonable?

A. The Risk Assessment for the Feasibility Study was done according t USEPA guidance documents as stated in the approved Work Plan. It use validated laboratory data from the Remedial Investigation and typica risk assessment exposure pathways for hazardous waste disposal sites.

Q. Is there enough evidence of a plume moving away from the site?

A. The Remedial Investigation showed hydrogeologic and chemical dat providing strong evidence of the apparent bedrock aquifer connection an the resultant impacts. With this information, the analyses an modelling presented in the Remedial Investigation/Feasibility Study wer considered appropriate.

Q. How will the land use restrictions affect property?

A. The land use restrictions will only apply to the land considered th site owned by the City. This restriction is to protect the cap b avoiding any future disturbance.

Q. The Proposed Remedial Action Plan uses a lot of terms like "partially meets", "reduces", etc. I'm concerned the remedial alternative will not work and something will need to be done in the future.

A. The Federal Superfund requires remedies which are not permanent be reviewed every five years to decide if remedial goals were met. The State similarly reviews remedies to decide if they are still protective using annual monitoring data. The preferred remedy is expected to reduce risks to acceptable levels. If this does not occur, the preferred remedy includes evaluating additional controls to further reduce impacts. The need for installing additional controls will be decided by evaluating the required monitoring data. This requirement is based upon the need to install the best possible remedy to reduce the harmful impacts.

Q. Will the project meet criteria set up by the Gloversville Water Board?

A. The preferred remedy will meet appropriate standards, criteria and guidance for both the landfill closure and the water supply extension. The Proposed Remedial Action Plan, in particular, recognized the obligation of meeting the Water Board's criteria.

Site Environment Questions

Q. What about other sources of contamination?

A. Other potential contaminant sources are identified in the Remedial Investigation/Feasibility Study even though investigating those sources were outside the scope of work. The collection of upgradient groundwater and upstream surface water samples allowed evaluating the landfill's impact on these resources. The results showed an absence of ammonia in these samples compared to high landfill leachate ammonia levels. This indicated the landfill is the ammonia source in Anthony Creek and groundwater.

Q. What were the site conditions compared to?

A. To decide if the site conditions caused impacts, the results of the site sampling were compared to areas considered clean. Wells were installed in areas which would be near the site but in an unaffected location. Soil, sediment and surface water samples were also collected in a similar fashion. These samples would give results which could be considered the typical, clean condition of the area. This "typical condition" was compared to site sampling results to find out if the landfill impacts were present. Sample results were also compared to literature values. These literature values are a reliable source of information about both typical conditions and contaminated conditions.

Q. Couldn't the barium found in the groundwater in private wells be from the septic systems?

A. When the barium was found, potential sources were considered including whether it came from the septic systems. The locations of the septic systems were studied to see if they were a possible source. After reviewing the locations where barium was found, its presence could not be due to septic systems alone.

Q. How come the landfill was investigated as an inactive hazardous waste site?

A. The site was brought to the Department's attention when fish kills in the Anthony Creek and complaints were noted. A preliminary investigation led to a Class 2 site listing on the New York State Registry of Inactive Hazardous Sites. The Class 2 category means the State feels the site causes human health and environmental threats needing evaluation and possible action.

Q. What can be done with land adjacent to the landfill that is contaminated and is not being cleaned up?

A. The landfill investigation included sampling surrounding areas to find out if they needed to be cleaned up. The landfill's conditions do not present a threat to these areas except for surface water and groundwater. The site's conditions did not make it necessary to place land use restrictions on adjacent parcels.

Q. Is the Landfill located on faults?

A. The landfill is believed to be located on faults based on geophysical surveys and bedrock drilling.

Q. I'm concerned about the contaminants that are migrating to Pond D.

A. The contaminants currently migrating to Pond D will be reduced if the Landfill is capped according to state regulations. The human health risk assessment did not show any risk from the contaminants already present at Pond D. The environmental quality should improve with the reduction in contaminant migration when the landfill is capped.

Q. Is the removal of the beaver dam to drain Pond B going to be approved

A. The Department's Division of Fish and Wildlife has accepted the draining of Pond B to further eliminate environmental damage from the Landfill

Q. How come the Remedial Investigation/Feasibility Study didn't find out whether hazardous waste was at the site?

A. The site investigation which was done before the Remedial Investigation/Feasiblilty Study resulted in the site being listed as a Class 2 site. A Class 2 site has confirmed hazardous waste disposal and causes a significant threat to human health and the environment. The Remedial Investigation/Feasibility Study was done to decide if the site needed to be cleaned up.

Cost Questions

Q. Does the community have to pay the full cost of the remedy?

A. The community will have to pay at least 25% of eligible costs if the project is done under the Environmental Quality Bond Act. There are other costs which are not eligible which can increase the community's share. If contributions from industry are obtained, the communities share may be reduced.

Q. Is the estimate of the project realistic? Can it go up?

A. The estimate is based upon costs which reflect the cost of similar work being done at this time. The cost of the same work done in 1995 could be different, either higher or lower. Typically, this estimate would be expected to be valid at 30% higher to 50% lower than the 28 million stated.

Q. Is the community's ability to pay for the remedy considered when selecting the remedy? Are there other funding sources which could reduce the community's cost?

A. No program in effect provides guaranteed funds for clean up of inactive hazardous waste sites. A site's remedial program costs are the amount necessary to contain, alleviate or end the threats caused by the site. State Superfund guidelines only allow considering remedial costs as a balancing factor with other listed criteria. Recovery of money from other responsible parties could reduce the City's share of clean up costs. There is no other public funding source to further reduce the City's costs.

Q. How are costs after construction paid?

A. The State does not fund any costs after construction. These costs will be paid either out of local monies or by responsible parties.

Q. How come there are no operation and maintenance costs estimated for the water supply line?

A. The Feasibility Study assumed water supply operation and maintenance costs would be distributed to the ratepayer through the rate structure. Typically, municipal water suppliers include O&M costs in their rate structure; therefore, this was considered reasonable for the Feasibility Study.

Q. Are there permitting costs in the operation and maintenance cost estimate?

A. There is no permit cost estimate in the operation and maintenance cost. Issuance of permits is not required for remedial construction although the work will need to follow typical technical permit conditions.

Q. Who are the responsible parties that will be pursued for recovery of costs?

A. A lawsuit has been filed by the State of New York against a number of entities to recover remedial costs. These entities include local municipal government and commercial entities including a number of tanneries. A list can be found in the court legal papers.

Q. Will remediation of the Landfill occur even though the responsible parties don't pay or the suit is not settled?

A. The remediation consists of two elements - the closure of the landfill and the installation of a public water supply. The closure of the landfill could move forward regardless of whether the commercial entities accept responsibility. This can occur because the City of Gloversville seems willing to close the landfill with State assistance. If the Permissive Use District is formed, the public water supply can also be installed using EQBA monies.

Q. How will the recovered costs be distributed?

A. Initially, the expenses incurred in the cost recovery action would be paid from the recovered monies. The remaining monies would then be distributed according to the EQBA 75% State share/25% local share formula.

Citizen Participation Plan Questions

Q. How come the Citizen Participation Plan wasn't effective? There didn't seem to be much opportunity for the public to get involved.

A. This project's citizen participation plan met the Department's statewide citizen participation guidelines. The plan was released to the public and no comments were received. Due to the type of work at the site, carrying out the plan led to infrequent public notice. During the design of the cleanup, a citizen participation plan will be developed for public comment. The plan will be revised to meet local concerns.

Q. How come the Department met privately with the Fulton County Chamber of Commerce & Industry?

A. The primary goal of the citizen participation activities is to help communication between the Department and individuals, groups and organizations. Communication with those who express interest in or are affected by the site should help the decision making process. We would be remiss to deny the views of any party affected by the site.

APPENDIX B

ADMINISTRATIVE RECORD
GLOVERSVILLE LANDFILL
SITE NUMBER 518001, FULTON COUNTY

Citizen Participation Plan; prepared by Tighe & Bond, Inc., Westfield, Massachussetts; for the City of Gloversville; dated 1989

Correspondence on Proposed Remedial Action Plan; prepared by Roemer and Featherstonhaugh, PC; for the Board of Water Commissioners, Gloversville Waterworks; dated December 3, 1993

Correspondence on Proposed Remedial Action Plan; prepared by Rainbow Alliance for Clean Environment; dated December 1, 1993

Correspondence on Proposed Remedial Action Plan; prepared by Fulton County Regional Chamber of Commerce & Industry; dated November 19, 1993

Correspondence on Proposed Remedial Action Plan; prepared by Whiteman Osterman & Hanna; for Gloversville PRP Steering Committee; dated December 3, 1993, revised December 9, 1993, revised December 10, 1993

Evaluations of Operations, Gloversville Landfill; prepared by SCS Engineers; for the Fulton County Plannning Department; dated April 1981

Feasibility Study Report; prepared by Tighe & Bond, Inc., Westfield, Massachussetts; for the City of Gloversville; dated October 1993

Field Sampling Plan for Municipal Sanitary Landfill; prepared by Tighe & Bond, Inc., Westfield, Massachussetts; for the City of Gloversville; dated October 1989

Guidance Documents, various; see Remedial Investigation & Feasibility Study; prepared by Tighe & Bond, Inc., Westfield, Massachussetts; for the City of Gloversville; dated September 1993 & October 1993, respectively

Inactive Hazardous Waste Disposal Report; prepared by the New York State Department of Environmental Conservation, Division of Hazardous Waste Remediation

Interim Order on Consent, Index Number CV-87-637; between the City of Gloversville and the New York State Department of Environmental Conservation; dated March 4, 1989

Mailed notice of Phase I RI/FS Report addendum and Phase II RI/FS workplan availibility; prepared by Tighe & Bond, Inc., Westfield, Massachussetts; for the City of Gloversville; dated 10/25/91

Mailed notice of public meeting on Phase I RI/FS Report; prepared by Tighe & Bond, Inc., Westfield, Massachussetts; for the City of Gloversville; dated 8/12/91

Mailed notice of RI/FS workplan responsiveness summary and citizen participation plan availibility; prepared by Tighe & Bond, Inc., Westfield, Massachussetts; for the City of Gloversville; dated 5/31/89

Mailed notice of public meeting on RI/FS workplan; prepared by Tighe & Bond, Inc., Westfield, Massachussetts; for the City of Gloversville; dated 4/17/89

Mailed notice of public meeting on Proposed Remedial Action Plan; prepared by Tighe & Bond, Inc., Westfield, Massachussetts; for the City of Gloversville; dated 10/20/93

Newspaper notice of RI/FS workplan availibity and public meeting; prepared by Tighe & Bond, Inc., Westfield, Massachussetts; for the City of Gloversville; dated 4/5/89

Phase I Investigation; prepared by Wehran Engineering, PC; for the New York State Department of Environmental Conservation; dated April 1986

Phase 2 Scope of Work for Remedial Investigation/Feasibility Study; prepared by Tighe & Bond, Inc., Westfield, Massachussetts; for the City of Gloversville; dated September 25, 1989

Project Quality Assurance Plan; prepared by Tighe & Bond, Inc., Westfield, Massachussetts; for the City of Gloversville; dated August 1989, revised November 1989

Remedial Investigation Report, Volumes I through VII; prepared by Tighe & Bond, Inc., Westfield, Massachussetts; for the City of Gloversville; dated September 1993

Responsiveness Summary; prepared by the New York State Department of Environmental Conservation; dated January 1994

Soil Resource Report for the City of Gloversville Sanitary Landfill; prepared by Soil Conservation Service; for the City of Gloversville; dated December 1976

Work Plan; prepared by Tighe & Bond, Inc., Westfield, Massachussetts; for the City of Gloversville; dated January 12, 1989