MALCOLM PIRNIE

New York State Department of Environmental Conservation

Columbia Mills Landfill DW7396

O&M Plan

☑ Approved ☐ Approved As Noted ☐ Resubmit With Revisions ☐ Disapprove

COMMISSIONER OF ENVIRONMENTAL CONSERVATION

Designated Representative

Date 2/12/97

POST-CLOSURE OPERATIONS, MAINTENANCE AND MONITORING PLAN FOR COLUMBIA MILLS LANDFILL

7.38-012 MINETTO, NY OSWEGO COUNTY

PREPARED FOR:
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PREPARED BY:
MALCOLM PIRNIE, INC.

JANUARY 1997
REVISED FEBRUARY 1997

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COLUMBIA MILLS LANDFILL (NYSDEC)
POST-CLOSURE OPERATIONS, MAINTENANCE AND MONITORING PLAN

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1.0 INTRODUCTION

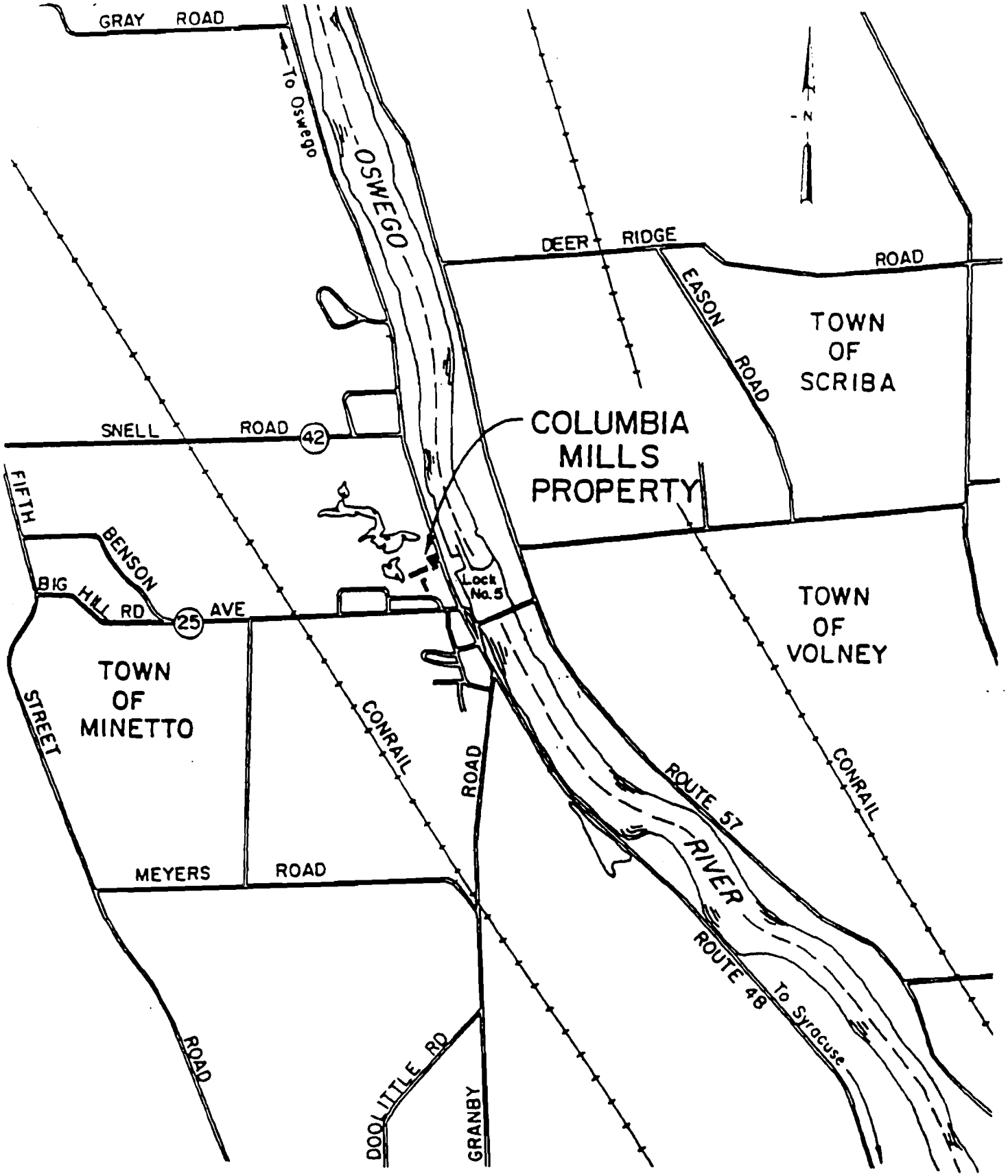
1.1 BACKGROUND

The Columbia Mills site (Registry #738012) is located in Minetto, New York, just west of the Oswego River on New York State Route 48 (Figure 1). Columbia Mills was a manufacturer of cloth and vinyl products from 1887 until the plant closed in 1976. The property was sold to Columin Development Corporation, who initiated salvaging operations. The salvaging ended prematurely and the property was abandoned. Currently, the property is jointly owned by the County of Oswego and the Town of Minetto.

The property consists of approximately 10 acres of standing structures, partially and wholly demolished buildings, and rubble, plus approximately 40 acres of undeveloped property which includes several ponds, streams and the plant's former landfill (drum disposal area) (Figure 2).

A Remedial Investigation (RI) and Feasibility Study (FS) have been conducted at the Columbia Mills site by Malcolm Pirnie, Inc., on behalf of Columbia Mills, Inc. and Bond, Schoeneck & King, to identify areas of contamination and determine what actions should be taken to alleviate the contamination. The reports documenting the RI/FS process were reviewed by the New York State Department of Environmental Conservation (NYSDEC) and were made available to the public for their review and comment. Following the public's review of the documents, the NYSDEC selected a final remedial alternative for the site in a Record of Decision (ROD) dated March 1992.

Following completion of the RI/FS, Malcolm Pirnie completed capping and closure of the plant's former landfill under NYSDEC Work Assignment No. D002825-12. This remedial action addressed contaminated fill material, sediment, and shallow groundwater present in the drum disposal area. The stockpiled soils originating from the underground storage tank (UST) excavations in the main plant area portion of the site and contaminated sediments from Benson Creek were also capped in the landfill, as were the sediments and excavated materials from the main plant area sewers.



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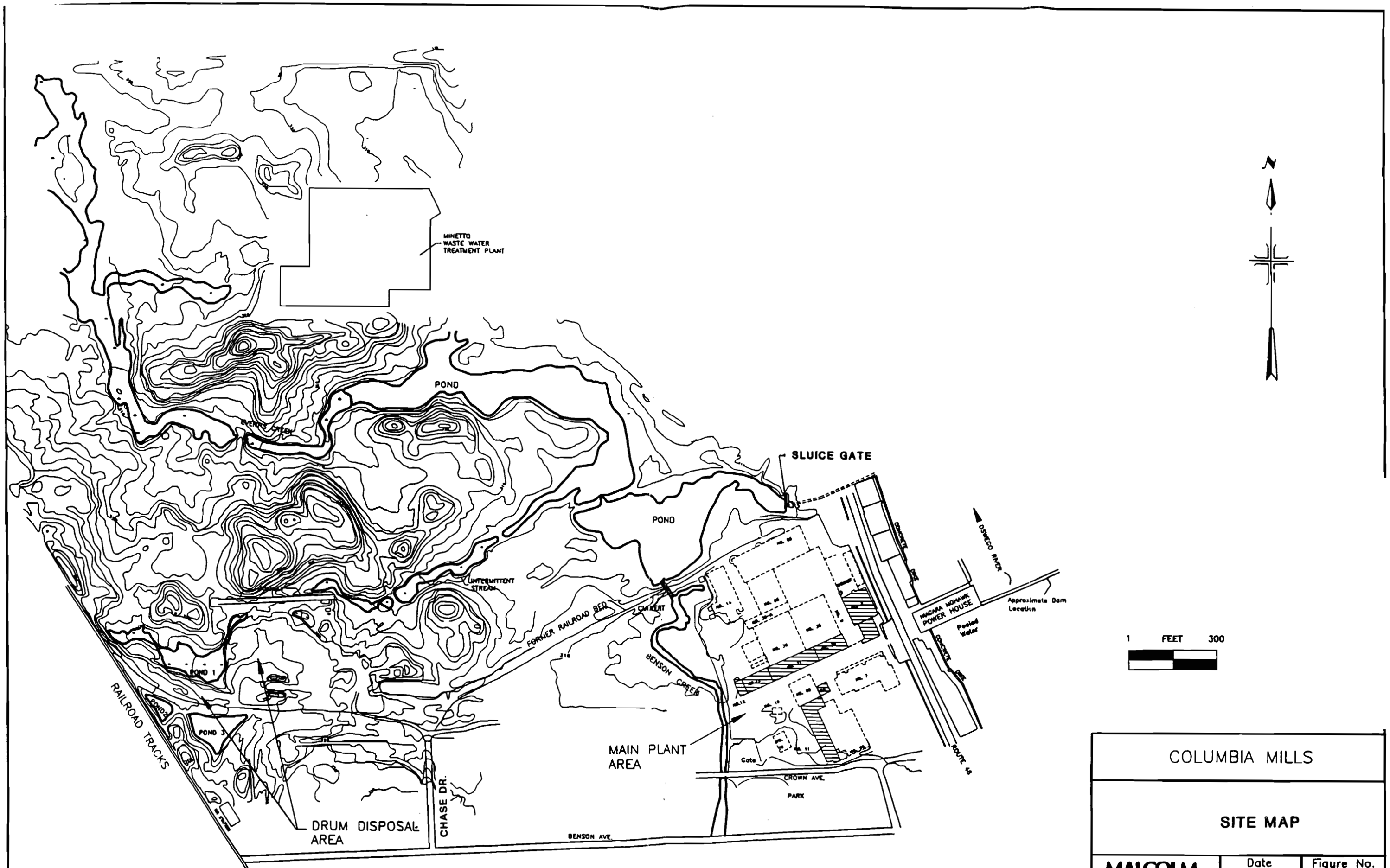
COLUMBIA MILLS
SITE LOCATION MAP

FIGURE 1

APRIL 1989

SCALE: 1" = 2000'



COLUMBIA MILLS		
SITE MAP		
MALCOLM PIRNIE	Date October 1991	Figure No. 2

1.2 PURPOSE AND SCOPE

The purpose of this report is to develop a post-closure operations, maintenance, and monitoring plan for the Columbia Mills Landfill that provides a comprehensive means for ensuring the continued effectiveness of the remedial measures. Section 2.0 of this report provides a description of the sampling and analytical programs. Section 3.0 presents guidelines for post-closure maintenance and monitoring. Emergency/contingency and the Health and Safety Plans are presented as Sections 4.0 and 5.0, respectively. Finally, record keeping and reporting requirements are presented in Section 6.0.

2.0 POST-CLOSURE MONITORING

The following sections describe the post-closure contaminant monitoring program to be implemented at the Columbia Mills Landfill. The sampling program will include collection of groundwater, leachate/groundwater discharge, and sediment samples, as well as landfill gas monitoring. All samples will be submitted to a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified laboratory for chemical analysis. Sampling location, frequency, and the parameters to be analyzed are presented in Section 2.1. Sampling procedures are summarized in Section 2.2, and standard operating procedures (SOPs) are detailed in Appendix A. The analytical program, consisting of analytical parameters and methods, quality control, reporting and deliverables, validation of data, and analytical results, is outlined in Section 2.3.

2.1 SAMPLING PROGRAM

The post-closure contaminant monitoring program is comprised of groundwater, leachate/groundwater discharge, and sediment sampling, as well as landfill gas monitoring. Sampling locations, frequency, and parameters are presented below and are summarized in Table 2-1.

- Groundwater samples will be collected annually from shallow monitoring wells LF-1S, -2S, -3S, and -4S, and deep monitoring wells LF-1D, -2D, -3D, and -4D. These eight samples will be analyzed for Target Compound List (TCL) volatile organics, total metals (identified in Table 2-1), cyanide, and field parameters including pH, Eh, temperature, turbidity and specific conductivity.

- One leachate/groundwater discharge sample will be collected monthly from the Amphibian Breeding Pond (ABP) inlet and analyzed for TCL volatile organics, total metals, cyanide, and field parameters. Depending on sampling results, sampling may be reduced to quarterly after one year.

- A composite sediment sample will be collected at year one then every five years from the ABP and analyzed for TCL volatile organics, total metals, and cyanide.

TABLE 2-1
COLUMBIA MILLS LANDFILL
POST-CLOSURE OPERATIONS & MAINTENANCE PLAN
CONTAMINANT MONITORING PROGRAM

Sample Measurement Type	Monitoring Location	Collection/ Measurement Frequency	Parameters	QC Samples
Groundwater	LF-1S,D LF-2S,D LF-3S,D LF-4S,D	Annually	Target Compound List (TCL) Volatiles Total Metals[1] Cyanide Field Parameters[2]	Matrix Spike Matrix Spike Duplicate[5]
Leachate/Groundwater Discharge	Amphibian Breeding Pond Inlet [3]	Monthly to Quarterly after First Year	Target Compound List (TCL) Volatiles Total Metals[1] Cyanide Field Parameters[2]	—
Sediment	Amphibian Breeding Pond Sediment	Every Five Years	Target Compound List (TCL) Volatiles Total Metals[1] Cyanide	Matrix Spike Matrix Spike Duplicate[5]
Landfill Gas	Gas Vents 1-2	At Year One and Evaluate	Explosive Gas (% LEL) & Percent Oxygen[4]	—
Groundwater Elevation	LF1-S,D LF2-S,D LF3-S,D LF4-S,D LFP1-15	Annually	—	—

NOTES:

(1) *Total metals include: aluminum, antimony, arsenic, barium, cadmium, chromium, copper, iron, lead, magnesium, manganese and zinc.*

(2) *Field parameters include: pH, Eh, temperature, turbidity and specific conductivity.*

(3) *If invert of Amphibian Breeding Pond inlet is below pond surface elevation, sample shall be collected from upstream sample manhole. If results exceed effluent criteria permit limits presented in Table 2-4, discrete samples shall be collected from each of the three feed lines to the sample manhole and analyzed for all indicated parameters.*

(4) *Percent lower explosive limit (%LEL) & percent oxygen to be measured with an explosimeter.*

(5) *Matrix Spike Duplicate applies to organics —Duplicate analyses shall be performed for inorganics.*

- Landfill gas will be measured at year one in Gas Vents 1 and 2, and the results will be presented as a percentage of the Lower Explosive Limit (LEL) and percent oxygen. Future monitoring requirements will be evaluated based on these sampling results.

- Groundwater elevations will be measured annually in monitoring wells LF-1S, -1D, -2S, -2D, -3S, -3D, -4S, -4D, and piezometers LFP-1 through 14.

Because the stability of samples varies greatly by parameter (e.g., metals are more stable than volatile organics), a hierarchy for sample collection is established. The order of sample collection should be as follows:

- Volatile Organic Compounds
- Field Parameters
- Total Metals
- Cyanide

2.2 SAMPLING PROCEDURES

The following general procedures will be followed during all sampling activities:

- The samples must be representative of the medium being sampled.

- For each sample, dedicated or precleaned sampling equipment, a new pair of protective gloves, and an appropriate container will be used. Non-dedicated equipment will be comprised of stainless steel or teflon and shall be cleaned by washing with a non-phosphate soap (e.g. Alconox™) solution and rinsed with a minimum of two volumes of tap water and one volume of deionized (DI) water.

- The method-required preservatives and storage procedures must be used to minimize the loss of analytes of interest due to absorption, chemical or biological degradation, and/or volatilization.

- The appropriate volumes must be collected to ensure that the required detection limits can be met and quality control samples can be analyzed. The analytical laboratory should be contacted to determine their required sample volume.

- Information related to sample collection will be entered into the field logbook and on the chain-of-custody form.

- Following collection, the samples must be properly packaged in laboratory precleaned containers, labeled, and shipped to the laboratory in a manner to ensure samples are kept at the appropriate temperature and that the holding times for the analysis can be met.

2.2.1 Groundwater Sampling

Eight groundwater samples will be collected from shallow and deep monitoring wells. Prior to each sampling event, water table measurements from the top of the well riser should be made to determine the general direction of groundwater flow and gradient.

Following the water table measurements and prior to sampling, each monitoring well will be purged of three to five times the volume of standing water in the well and until the specific conductance, temperature, pH, Eh, and turbidity of the groundwater are stabilized. If a well is pumped dry before removing this volume of water, the well can be sampled following sufficient recovery but before 24 hours from the purging end time. However, if possible, the wells should not be pumped dry. Table 2-2 summarizes the monitoring well and piezometer construction details.

Groundwater pumps fitted with dedicated collection tubing or disposable polyethylene bailers will be used to purge the wells. The purge rate and volume of water in the well should be recorded in the field notes. Purge water from monitoring wells known to be contaminated will be collected and stored in the leachate collection tank for proper disposal. Purge water from monitoring wells with minimal contamination can be discharged to the ground in the vicinity of the well.

Each groundwater sample will be collected using a new and unused disposable bailer and transferred to the appropriate containers. VOC samples will be filled in a manner which minimizes turbulence and ensures no head space or air bubbles remain in the sample vial. Any physical characteristics of the groundwater (e.g., color, sheen, odor) observed at the time of sampling will be recorded in the field notes.

Refer to Appendix A.1 for the SOP for groundwater sampling.

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TABLE 2-2

MONITORING WELL AND PIEZOMETER CONSTRUCTION SUMMARY

Well #	Ground Elev.[1]	Well Dia.	Borehole		Top of Screened Interval			Well/ Piezometer Construction Material	Top of Riser Elev.[1,4]
			Depth [2] (feet)	Elev.[1,3]	Depth[2] (feet)	Elev.[1,3]	Length (feet)		
LF-1S	322.85	2"	15.00	307.85	10.00	312.85	5.00	PVC	324.85
LF-1D	323.14	2"	25.00	298.14	20.00	303.14	5.00	PVC	325.14
LF-2S	333.93	2"	15.00	318.93	10.00	323.93	5.00	PVC	335.93
LF-2D	333.90	2"	25.00	308.90	20.00	313.90	5.00	PVC	335.90
LF-3S	314.02	2"	15.00	299.02	10.00	304.02	5.00	PVC	316.02
LF-3D	313.79	2"	25.00	288.79	20.00	293.79	5.00	PVC	315.79
LF-4S	319.63	2"	15.00	304.63	10.00	309.63	5.00	PVC	321.63
LF-4D	319.26	2"	25.00	294.26	20.00	299.26	5.00	PVC	321.26
LFP-1	336.94	2"	16.00	320.94	9.00	327.94	5.00	PVC	338.94
LFP-2	329.71	2"	14.50	315.21	9.50	320.21	5.00	PVC	331.71
LFP-3	326.94	2"	11.00	315.94	6.00	320.94	5.00	PVC	328.94
LFP-4	325.20	2"	10.00	315.20	5.00	320.20	5.00	PVC	327.20
LFP-5	328.64	2"	18.70	309.94	13.70	314.94	5.00	PVC	330.64
LFP-6	326.57	2"	17.50	309.07	12.50	314.07	5.00	PVC	328.57
LFP-7	324.30	2"	11.00	313.30	6.00	318.30	5.00	PVC	326.30
LFP-8	321.39	2"	12.00	309.39	7.00	314.39	5.00	PVC	323.39
LFP-9		2"	13.50		8.50		5.00	PVC	
LFP-10	321.90								323.90
LFP-11	336.68	2"	20.00	316.68	15.00	321.68	5.00	PVC	338.68
LFP-12		2"	20.00		15.00		5.00	PVC	
LFP-13	317.99	2"	6.00	311.99	1.00	316.99	5.00	PVC	319.99
LFP-14	338.82	2"	26.00	312.82	19.00	319.82	5.00	PVC	340.82

NOTES:

(1) *Elevation is in feet; distance above sea level.*

(2) *Measured from ground surface.*

(3) *Elevation measured from ground surface.*

(4) *Elevation estimated based on standard two-foot above grade riser.*

2.2.2 Leachate/Groundwater Discharge Sampling

One leachate/groundwater discharge grab sample will be collected at the ABP inlet, unless the pipe invert is below the pond surface elevation, in which case the sample must be collected from the upstream sample manhole. The laboratory precleaned container will be hand-filled or securely clamped to the end of a telescoping aluminum tube that serves as a handle. The sample container will be slowly submerged in the discharge pipe or, if necessary, in the manhole and retrieved with minimal surface disturbance. No air bubbles shall be present in or at the surface of the VOC sample prior to capping.

Refer to Appendix A.2 for the SOP for surface water sampling adapted for leachate/groundwater discharge sampling.

2.2.3 Sediment Sampling

A composite sediment sample will be collected from the ABP. The composite shall be comprised of equal volumes of sediment collected from a minimum of four locations, which will be field-selected to provide a representative indication of the entire pond floor. A stainless steel corer fitted with a cellulose acetate sample sleeve will be used to collect sediment from the pond. At each grab location, the sampler will be slowly driven through the water and approximately two to three inches into the sediment. It is important to keep the disturbance at the sediment/water interface to a minimum. The collection procedure shall be repeated at each grab location until adequate sample volume is obtained. For the VOC sample, an aliquot will be collected from each grab location and transferred to a discrete VOC sample jar for laboratory-compositing under controlled conditions. Equal sediment volumes from each grab location shall then be transferred to a precleaned stainless steel mixing bowl, mixed with a precleaned stainless steel trowel and transferred to the appropriate laboratory-supplied container for analysis of the remaining parameters.

Refer to Appendix A.3 for the SOP for sediment sampling in shallow water.

2.2.4 Landfill Gas Monitoring

Landfill gas measurements in Gas Vents 1 and 2 will be obtained as described below. Prior to sampling, an ambient air measurement for methane will be obtained from within five feet of the vent.

- An airtight seal will be formed over the end of the gas vent through the use of a steel band placed around a "Saranax" bag.
- Tygon tubing will be used to connect the bag to a 12-volt vacuum pump (see Figure 3).
- Prior to sampling, approximately five cubic feet will be withdrawn or five minutes of purging will occur (whichever is shorter) to ensure that a representative sample is collected.
- Following purging, the air stream will be monitored for explosive/ combustible gases through the use of an explosimeter.

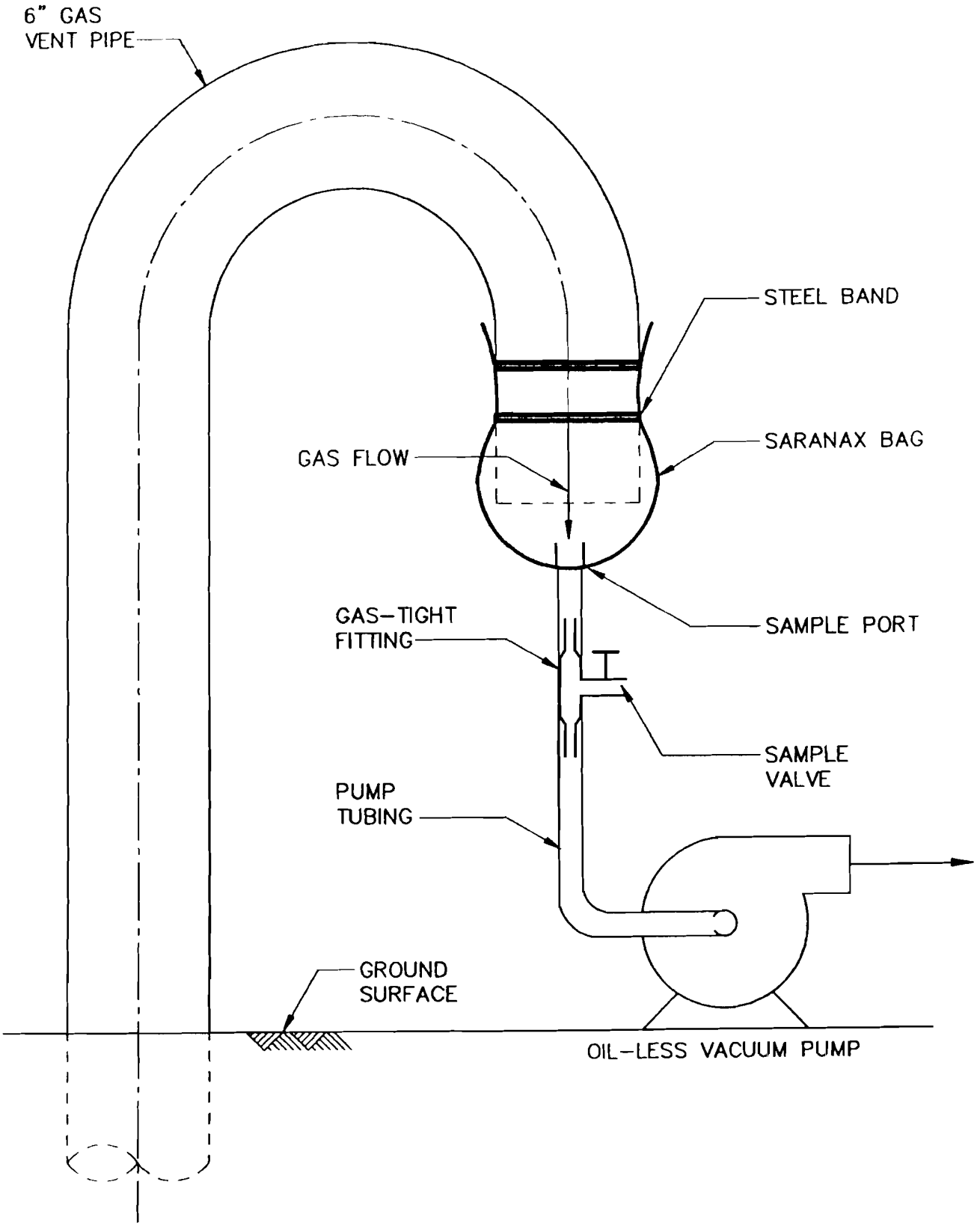
The results will be presented as percent LEL of methane and percent oxygen. The initial measurement will represent the concentration of combustible vapors being released from the gas vents to the open air. Measurements taken after purging will be more indicative of the actual concentration of migrating combustible gas which is in the soil surrounding the gas vents.

Small quantities of methane can occur naturally in the soil as a result of the decomposition of organic matter. Therefore, only monitoring results above 25 percent LEL will be considered significant.

2.3 SAMPLE ANALYTICAL PROGRAM

The following sections outline the parameters each sampling medium will be analyzed for and the methods the laboratory will follow, as well as the required laboratory quality control (QC) samples to be collected. The reporting format of the data, data usability procedures, and the analytical results to be discussed are also presented.

FIGURE 3



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COLUMBIA MILLS LANDFILL
GAS VENT MONITORING PLAN

SAMPLE COLLECTION METHOD

2.3.1 Analytical Parameters and Methods

The analysis of groundwater, leachate/groundwater discharge, and sediment samples during post-closure monitoring will include TCL volatiles, total metals, and cyanide as shown on Table 2-1. As indicated on Table 2-3, USEPA SW846 methodology will be used for chemical analysis of all samples collected during this monitoring program.

2.3.2 Laboratory QC Samples

To ensure that the sample results are representative of the environment from which they are collected, and that the results meet the needs of the sampling plan, quality control (QC) samples will be collected and analyzed. Quality control protocols have been designed to prevent cross-contamination of samples, document the entire sampling program, and maintain a chain-of-custody procedure for the samples.

The laboratory will prepare trip blanks that will accompany sample bottles into the field and be returned to the lab with the samples collected. One aqueous trip blank for volatile organics will be analyzed each day volatile organics are sampled. As indicated on Table 2-1, samples for matrix spike and matrix spike duplicate (duplicate) analyses will also be collected from one groundwater sample and from the ABP sediment composite. Since the sampling equipment is either dedicated or disposable, no equipment blanks will be prepared.

2.3.3 Reporting and Deliverable Requirements

Analytical data generated by the laboratory will be reported in a format that will allow the review of samples analyzed and evaluation of the usability of the sample data. The analytical report generated by the laboratory will include, for each sample:

- Sample location/sample number
- Date collected
- Date extracted or digested
- Date analyzed
- Analytical methodology (including digestion method used for metals analysis)

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TABLE 2-3

COLUMBIA MILLS LANDFILL
POST-CLOSURE OPERATIONS & MAINTENANCE PLAN

SAMPLE METHODS, PRESERVATIONS, AND HOLDING TIMES

Parameter	SW-846 Method	Preservation[1]		Holding Time
		Solids	Liquids	
TCL Volatiles	8240 (GC/MS)	Cool to 4°C	HCl to pH≤2 Cool to 4°C	14 days
Total Metals	6010A (ICP)	Cool to 4°C	HNO_3 to pH≤2 Cool to 4°C	6 months
Total Cyanide	9010A	Cool to 4°C	NaOH to pH≥12 Cool to 4°C	14 days

NOTE:
(1) Preservations will be added to the sample bottles in the laboratory prior to collection. Ice will be used to cool samples in the field and in transit to the laboratory.

- Method for sample cleanup (if used)
- Method detection limits
- Sample dilution factor (if applicable)
- Analytical results
- Chain-of-Custody forms

2.3.4 Data Usability

All analytical data will be evaluated for quality and usability. A data usability summary report (DUSR) will be prepared by an experienced environmental scientist and/or the project Quality Assurance Officer. The DUSR is prepared by reviewing and evaluating the analytical data. The parameters to be evaluated in reference to compliance with the analytical method protocols include all sample chain-of-custody forms, holding times, raw data (instrument print out data and chromatograms), calibrations, blanks, spikes, controls, surrogate recoveries, duplicates and sample data. If available, the field sampling notes should also be reviewed and any quality control problems should be evaluated as to their effect on the usability of the sample data.

The DUSR describes the samples and analysis parameters reviewed. Data deficiencies, analytical method protocol deviations and quality control problems are described and their effect on the data is discussed. Resampling/reanalysis recommendations are made. Data qualifications are documented for each sample analyte following the NYSDEC Analytical Services Protocol 1991 Rev. guidelines.

2.3.5 Analytical Results

All sampling results will be compared to results obtained from previous sampling events to determine if changes have occurred. In addition, groundwater results will be compared to the New York State Water Quality Standards (NYSWQS) for Class GA waters. All exceedances will be highlighted and compared with previous sampling results. Any groundwater results exceeding the NYSWQS will trigger quarterly sampling at the monitoring well where the sample was collected until the results from two consecutive sampling events are below NYSWQS.

If the leachate/groundwater discharge sample collected at the ABP inlet, or in the manhole, exceeds the effluent criteria permit limits presented in Table 2-4, discrete samples will be collected from each of the three feed lines to the sample manhole and analyzed for the same parameters (any exceedance will most likely originate from the leachate feed line). Should this be the case, the leachate will be diverted to the on-site leachate storage tank until a leachate/groundwater discharge sample no longer exceeds the standards. If this situation arises, disposal options will have to be evaluated and implemented. For reference, Appendix B contains historical analytical results of the leachate/groundwater discharge (Malcolm Pirnie, Inc., 1997).

Analytical results of sediment sampling will be compared to values in NYSDEC, Division of Fish and Wildlife, Sediment Criteria Guidance Document. Table 2-5 lists criteria and limit of tolerance values for most inorganics; no criteria is available for antimony and silver. The criteria values in parenthesis reflect "no-effect" and "lowest-effect" levels, respectively. The limit of tolerance values indicate concentrations that would be detrimental to the majority of species, potentially eliminating most.

In addition to analytical results, groundwater elevation measurements taken at the time of sampling will be tabulated and used to prepare groundwater isopotential contour maps.

2.3.6 Reporting

The analytical data and evaluations discussed in Sections 2.3.1 through 2.3.5 will be presented in a report to NYSDEC following each monitoring event. Leachate/groundwater discharge results will be transmitted, in letter report format, monthly for the first year and quarterly thereafter. Following the first year of groundwater, leachate/groundwater discharge, and sediment sampling, an expanded report will be prepared that will include a summary of the apparent effectiveness of the remedial measures, including any observed trends in groundwater, leachate/groundwater discharge or sediment quality, as well as a discussion of the integrity of the cover system and infrastructure based on the quarterly inspections outlined in Section 3.0. Subsequent annual reports will discuss groundwater and leachate/groundwater discharge results; sediment sampling results will be included every

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TABLE 2-4 EFFLUENT CRITERIA OF SURFACE WATER DISCHARGE PERMIT	
Effluent	**Daily Maximum (mg/L)**
Toluene	0.01
Trichloroethane	0.01
Methyl ethyl ketone (MEK)	Monitor
Aluminum, Total	0.1
Antimony, Total	0.8
Barium, Total	0.3
Cadmium, Total	0.014
Chromium, Total	0.5
Copper, Total	0.1
Copper, Dissolved	Monitor
Iron, Total	0.3
Lead, Total	0.33
Manganese, Total	4.0
Zinc, Total	0.4
Cyanide, Total	0.06

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TABLE 2-5

COLUMBIA MILLS LANDFILL
POST-CLOSURE OPERATIONS & MAINTENANCE PLAN

SEDIMENT CRITERIA FOR METALS

Metal	Criteria[1] mg/kg (ppm)	Limit of Tolerance[2] mg/kg (ppm)
Antimony	[3]	[3]
Arsenic	5 (4.0-5.5)	33
Cadmium	0.8 (0.6-1.0)	10
Chromium	26 (22-31)	111
Copper	19 (15-25)	114
Iron	24,000 (20,000-30,000)	40,000
Lead	27 (23-31)	250
Manganese	428 (400-457)	1,100
Nickel	22 (15-31)	40
Silver	[3]	[3]
Zinc	85 (65-110)	800

NOTE:

[1] *Source: NYSDEC Sediment Criteria Guidance Document, December 1989. Values in parenthesis are "no-effect" and "lowest-effect" levels, respectively.*

[2] *Source: NYSDEC Sediment Criteria Guidance Document, December 1989. Concentration that would be detrimental to the majority of species, potentially eliminating most.*

[3] *No criteria listed.*

five years. Formal quarterly inspections are not necessary after the first year. Instead, obvious concerns will be noted throughout the year and included in annual written inspections.

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3.0 POST-CLOSURE INSPECTION AND MAINTENANCE

3.1 INSPECTION & MAINTENANCE SCHEDULE

NYSDEC will be responsible for site inspection and maintenance over the post-closure period. The inspections will be performed by persons experienced in landfill maintenance. During the first year, the site will be inspected a minimum of four times per year and after major rainfall events . For the purpose of these inspections, a major rainfall event refers to a 2-year, 5-hour storm with a rainfall accumulation of approximately 1.61 inches (Northeast Regional Climate Center, 1993). The results of the inspections shall be reviewed by NYSDEC and any problems recorded over the course of the year will be summarized in a monitoring report. After the first year, annual written inspections will be required; maintenance and sampling personnel will note obvious concerns throughout the year. The landfill site will be inspected for:

- Integrity of cover, including:
  - erosion or settling of cap materials
  - cracking/breaches in covers
  - loss of slope
  - pooling or pending of surface water
  - loss of vegetative cover
  - presence of undesirable plant or animal species
- Visible debris, litter and waste as a result of illegal dumping activities.
- Integrity of drainage ditches, including:
  - sediment buildup
  - clogging of drainage grates
  - cracking or breaching of storm water pipe
- Integrity of gas vents.
- Integrity of access roads, fences and gates.
- Condition of monitoring wells and piezometers.

- Condition of Aquatic Breeding Pond, including any apparent vegetative stress or indications of changes in aquatic population, and inlet and outfall structures.

A copy of the field inspection report is presented in Appendix C. A discussion of the major inspection and maintenance areas is presented in Sections 3.2 through 3.7.

3.2 COVER SYSTEM

Cover maintenance will be performed as necessary over the 30-year post-closure care period. Any signs of erosion or other site maintenance problems detected during routine site inspections will be corrected as soon as possible. All bare spots in the final cover will be reseeded and fertilized as necessary. Vegetative growth will be mowed twice a year to prevent the development of deep rooted vegetation, and not at times which conflict with nesting or other wildlife uses. Plant species whose presence is suspected to deteriorate the integrity of the final cover will be removed. Seeding and cap maintenance should be performed in accordance with Contract Documents Section 2900, Landscaping, and Section 6645, High Density Polyethylene (HDPE), Flexible Membrane Cap, respectively.

Part of the final cover system design includes a geocomposite drainage layer placed directly above the HDPE layer. The drainage layer collects infiltration trough the overlying topsoil and barrier protection layer soils and transmits it downgradient to a perimeter toe drain system. A series of 2-inch corrugated HDPE pipes around the perimeter of the landfill empties the flow into surface water ditches.

The 2-inch outlet pipes for the toe drain should be inspected on a quarterly basis to be sure they are free flowing and not covered with sod or sediment. If the outlet pipes become plugged, slope failures on the landfill may occur as a result of infiltration buildup within the cover materials.

In general, most cover system repairs will be made following the same procedures and using the same materials as for the original construction according to the Record Drawings attached as Appendix D. Minor soil cover material repairs will consist of replacement of lost/eroded soils with clean topsoil followed by the addition of starter

fertilizer and perennial grass seed. If minor repairs to the HDPE liner are necessary, the liner surrounding the breach will be exposed, broomed and washed. The defective area will then be cut out, and the edges around the remaining section will be roughened to remove oxidized material. A round patch will be cut from newly purchased HDPE material manufactured from similar resins, and will extend a minimum six inches around the defective area. All seams used in the repairing procedure will be approved extrusion welded seams subjected to the same test procedures required in the original construction specification. Topsoil and barrier protection soils removed for the purpose of exposing the defective liner will be placed per the construction specifications. If major cover system or infrastructure repairs are required, the repair procedure will be specified by NYSDEC prior to implementation.

3.3 DRAINAGE STRUCTURES

The surface water drainage system will be periodically checked for erosion. Inspections of the surface will occur quarterly, as well as following a major rain event (i.e., see Section 3.1). No run-on to the capped area is anticipated due to its elevation above the surrounding ground surface. Drainage ditches direct water to collection points, and all eroded areas in these drainage ditches will be repaired and regraded. Sediment buildup in the drainage ditches or storm sewer pipes will be removed if flow is restricted. Any other areas within the ditches where the cross-section or slope has been altered, such that flow is impeded, will be reworked and regraded as necessary. The catch basin beehive grate located near the southern boundary of the landfill will be checked and cleaned if necessary to prevent clogging.

The inlet to the Amphibian Breeding Pond should also be inspected quarterly to ensure that sediment buildup is not impeding the flow into the pond from the groundwater/leachate collection system. Inspections will also insure that the integrity of the inlet pipe, sampling manhole, and trapezoidal outfall weir are sound.

3.4 LEACHATE AND GROUNDWATER COLLECTION SYSTEM

The trench collection system around the perimeter of the landfill is designed to function as either a combined leachate and groundwater collection system or as two independent systems. The two systems are separated from one another by a vertical HDPE liner wall in a common trench. The two groundwater discharge pipes and the leachate discharge pipe are fitted with ball valves. The valves for the groundwater pipes are located in the sampling manhole, whereas the valve for the leachate pipe is located upstream near the leachate storage tank. Flow from the trench system can enter either the underground leachate storage tank or flow directly to the ABP by either opening or closing in-line valves. The leachate valve is hand-wheel operated at ground surface and is accessible through a cast iron frame and cover. The groundwater valves are accessed by entering the sampling manhole.

Intensive maintenance of the system is not expected as it is a non-mechanical, gravity flow system. The inside of the sampling manhole, however, should be inspected on a quarterly basis for evidence of sediment buildup. Sediment within the sampling manhole is indicative of a similar condition within the collection system. Should sediment be observed, the collection system should be flushed through the cleanouts located along the perimeter of the landfill. Localized evidence of mounding within the landfill, if observed during piezometer and groundwater monitoring, is indicative of a clog in the leachate collection line, in which case the appropriate action would be to flush the line.

All valves in the collection system, including those on the leachate storage tank, should be manually operated on an annual basis to ensure that they are still operative. Proper confined space entry procedures should be implemented before entering the sampling manhole to operate the groundwater discharge pipe valves inside.

3.5 GAS VENT SYSTEM

During the quarterly site inspections, gas vents will be inspected for plugging and damage of the vent risers, return bends and bird screens. If damage has occurred, the

damaged section will be replaced above the nearest connecting union. During site inspections, any yellowed vegetation around the vents or across the site will be noted. In these cases, supplemental landfill gas monitoring may be necessary to determine if excess landfill gas production is causing cover system damage.

3.6 GROUNDWATER MONITORING SYSTEM

The integrity of the groundwater monitoring wells and piezometers should be determined during routine monitoring. The well cap should maintain a waterproof seal to prevent rainwater from infiltrating into the well. This cap should also be locked to prevent tampering. In addition, the well riser should be inspected for cracks and damage. Well repair, if necessary, should be performed to restore the well to original construction conditions consistent with the Construction Contract Documents (Section 2051) for the Columbia Mills Landfill Closure.

If it is determined through long-term monitoring that a well is no longer required, well decommissioning should be performed in accordance with Contract Document Section 2051, together with NYSDEC's 1996 monitoring well decommissioning procedure guidance document (developed by NYSDEC and Malcolm Pirnie, Inc.).

3.7 VECTOR OBSERVATIONS

Due to the non-putrescible nature of the fill materials at the Columbia Mills Landfill, vectors are expected to be minimal or non-existent after closure of the landfill. As a part of each inspection, evidence of vectors will be recorded in item Nos. 20, 28, or 29 of the Post-Closure Field Inspection Report and described in the comment section of that report. In the event that a vector problem does arise, an extermination program, implemented by licensed professionals, can be initiated.

4.0 EMERGENCY/CONTINGENCY PLANS

4.1 FIRE/EXPLOSION

In case of fire at the landfill, the Minetto Fire Department will be dispatched to the scene. Emergency numbers are listed in the Health and Safety Plan (HASP) and should be updated annually. The fire department will be prepared with appropriate equipment to adequately handle anticipated emergencies at the landfill.

Fire equipment will be brought to the landfill via the access road off Benson Avenue or the former plant entrance off Route 48. Access to any area of the site can be accomplished by traveling along the perimeter or across the cap. Care should be taken to avoid rutting the landfill cover system by the fire equipment.

In the event of a fire, only authorized personnel will be allowed at the landfill. Details, including the source and cause of the fire, will be maintained at the fire department. The contaminants are capped with several layers, these being: the sub-grade (on-site fill, general fill, and/or excavation sediment); needle punched, non-woven geotextile; 40 mil. HDPE liner; gund-net HDPE drainage netting or equal; non-woven geotextile; 24-inch barrier protection layer; 6-inch topsoil and seeding layer; and the final grade. Refer to the Record Drawing (Sheet 14) for a detailed illustration of the cap construction. In all likelihood, due to the nature of the cap, the greatest potential for fire would be a grass fire without the threat of releases of contamination. However, if methane builds up within the landfill, and landfill gas monitoring did not detect it, a landfill gas fire could result. If waste is exposed during a fire or during fire fighting operations, appropriate air monitoring and personal protective equipment will be implemented until any damage to the landfill cap is repaired and the risk of exposure no longer exists. If a landfill gas or waste fire is experienced, fire fighters will be expected to use self-contained breathing apparatus (SCBA) to avoid inhalation of fumes. Dermal protection will also be required during fire-fighting activities.

4.2 PERSONAL INJURY

The closure of the landfill should control access by unauthorized individuals. If an accident does occur, the following procedure will be followed:

Injury when person is not incapacitated. Authorized personnel who receive injuries that do not incapacitate them, such as minor burns, punctures, and sprains, will be given first aid at the site only when necessary. The victim will then be taken to the hospital emergency room for examination and treatment. The phone number and directions to the hospital are included in Section 5.13 of the HASP.

Unauthorized persons who receive injuries that are not incapacitating *should not* be given first aid at the site unless absolutely necessary for the well being of the victim. If possible, obtain all personal information about the victim for purposes of completing accident forms. Instruct individual to go to his doctor for examination and required treatment. Inform police.

Serious Injury. First aid will be rendered only by individuals who have had first aid training. Give only that first aid which is necessary to prevent further harm to the accident victim. Seriously injured victims should not be moved unless they are in danger because of their location.

Be certain to obtain personal information about the accident victims in order to complete accident forms. If person is not authorized to be on the site, inform the police. An ambulance should be called to transport the victim to the hospital. Contact numbers are listed in Section 5.13 for ambulance services.

Procedures After an Accident: If assistance is need, the Minetto Volunteer Fire Department will respond to a non-emergency, on-site accident. All witnesses to the accident will be interviewed. Once the facts surrounding the accident have been compiled, probable cause will be determined and an accident report will be completed. After a thorough investigation and determination of the causes, corrective measures will be implemented to prevent similar accidents in the future. Corrective measures may include, but are not limited to, instruction to authorized personnel, additional safety precautions, and elimination or repair of unsafe conditions.

4.3 SEVERE WEATHER CONDITIONS

The landfill cap has been designed for adequate drainage and control of normal rain conditions. During severe weather conditions (heavy rainstorms), the integrity of the constructed cap and surrounding terrain may deteriorate in localized areas due to erosion. After the occurrence of a severe storm, an inspection of the landfill area will be conducted to check for erosion of the cover, and adjacent areas that could eventually affect the cover. In the event that excessive erosion has resulted, actions will be taken to repair and return the damaged area to its proper state.

4.4 EXPLOSIVE GAS

Gas vents have been included in the design of the landfill to provide passive gas venting over the entire landfill. Periodically, a visual survey of the area should be conducted to locate signs of differential settlement, expansion of the geomembrane layer, vegetative stress, odors, septic soil, and hissing or bubbling gases which may indicate improper venting or potential gas migration routes.

If the above conditions are encountered, an additional explosive gas survey may be necessary. The gas survey could be conducted by advancing a ½-inch diameter steel rod approximately one foot into the ground, withdrawing the rod and lowering a gas collection probe into the hole. Care should be taken not to exceed a depth of one foot in order to protect the geomembrane from damage. Gas concentrations would be measured as a percentage of the gas's LEL using a portable combustible gas meter.

The aerial extent of the survey should include the landfill and approximately a 100- to 200-foot boundary outside the perimeter of the landfill. Readings obtained from the landfill area should not exceed the LEL for gases detected at the property boundary or beyond it. A grid system should be used to determine sampling points. Sampling points should be pre-determined by NYSDEC. Monitoring points should include, however, points around the perimeter of the landfill and areas next to access roads, utility poles, and underground utilities which can facilitate gas migration through porous backfill material.

Monitoring should also be conducted in off-site structures within a one quarter mile radius. These readings should not exceed 25 percent of the LEL.

Measurements of explosive gas levels should be plotted and contoured in order to evaluate areas of high concentrations and possible migration paths. This assessment should consider the distance to adjacent structures, observed off-site and on-site vegetation damage, and subsoil potential for promoting extensive lateral migration. This information will determine the need for an active gas control system.

Depending on the extent of the off-site gas migration, the potential gas control options involve:

- Additional gas vent risers.
- Perimeter passive gas collection system.
- Conversion of the existing passive system to a flare system.

Areas of the cover system that are damaged during installation of these systems will be returned to their original condition. The gas collection systems should limit the explosive gas concentrations to 5 percent by volume, at or beyond the property boundary, or 1.25 percent in areas within one-quarter mile.

5.0 HEALTH AND SAFETY PLAN

The full Health and Safety Plan for the Columbia Mills site is presented as Appendix E. It addresses those site-specific hazards which, at the time of this post-closure monitoring plan development, may potentially be encountered while performing the post-closure maintenance and monitoring tasks described herein. General Health and Safety guideines for non-intrusive activities are described below. Neither NYSDEC nor Malcolm Pirnie accept responsibility for the Health and Safety of any individuals other than their own employees. Site representatives, contractors, or any other persons performing work at the site shall be required to provide their own site-specific HASP covering their employees and subcontractors. Appendix E contains the full HASP should intrusive activities be required.

5.1 HAZARD EVALUATION

5.1.1 Summary of Projected Risks

Based on the results of previous site investigations, potential hazards have been identified for each work task involved. These hazards are listed in Table 5-1. The principal points of exposure would be through direct contact with contaminated fill/soils and groundwater, through the inhalation of contaminated particles or vapors. Since work will be performed during summer/winter time periods, the potential exists for heat/cold stress to impact workers especially those wearing protective equipment and clothing.

Although no work can be considered completely risk-free, logical and reasonable precautions will be implemented to provide an adequate level of protection for workers. The integration of medical evaluations, worker training relative to chemical hazards, safe work practices, proper personal protection, environmental monitoring, work zones and site control, appropriate decontamination procedures and contingency planning into the project approach will minimize the chance of unnecessary exposures and physical injuries.

5.1.2 Physical Hazards

Field reconnaissance activities may present the following physical hazards:

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TABLE 5-1

PROJECT TASKS WITH POTENTIAL HAZARDS

Project Task	Potential Hazards
1. Conduct site inspections and maintenance.	Exposure to contaminants: dermal, oral, and inhalation. Physical hazards.
2. Sample groundwater, leachate/groundwater discharge, and sediment.	Exposure to contaminants: dermal, oral and inhalation. Physical hazards.
3. Conduct landfill gas monitoring.	Exposure to contaminants: inhalation. Physical hazards.
4. Groundwater level monitoring.	Exposure to contaminants: inhalation. Physical hazards.

- The potential for heat/cold stress to employees during the summer/winter months (see Section 5.4).
- The potential for slip-and-fall injuries due to rough, uneven terrain.
- The potential for injury if a landfill gas or waste fire is experienced.

5.1.3 Chemical Hazards

The primary routes of exposure to the contaminants found on the site (see Appendix E) are through inhalation of dusts and by direct contact.

5.2 SAFE WORK PRACTICES

All employees shall obey the following safety rules during on-site work activities:

- Eating, drinking, chewing gum or tobacco, smoking, or any practice which increases the probability of hand-to-mouth transfer of contaminated material is strictly prohibited.
- The hands and face must be thoroughly washed upon leaving the work area and prior to engaging in any activity indicated above.
- Contact with surfaces/materials either suspected or known to be contaminated will be avoided to minimize the potential for transfer to personnel, crosscontamination and need for decontamination.
- Medicine and alcohol can potentiate the effects of exposure to toxic chemicals. Due to possible contraindications, use of prescribed drugs should be reviewed with the Pirnie occupational physician. Alcoholic beverage and illegal drug intake are strictly forbidden during site work activities.
- All personnel shall be familiar with standard operating safety procedures and additional instructions contained in the Health and Safety Plan.
- All employees have the obligation to correct or report unsafe work conditions.

5.3 PERSONAL PROTECTION EQUIPMENT

Personnel must wear personal protective equipment (PPE) when work activities involve known or suspected atmospheric contamination or when direct contact with dermally active substances may occur. Chemical-resistant clothing will be used to protect the skin from contact with skin-destructive and skin-absorbable chemicals. All PPE shall be maintained and stored as specified by the manufacturer. Good personal hygiene and safe work practices, as identified in Section 5.2, are also necessary to limit or prevent the ingestion of potentially harmful substances.

Personal protection equipment has been designated for each project task where potential hazards exist. The designated PPE for each task is listed in Table 5-2. The Site Health and Safety Coordinator will monitor the use of PPE during extreme temperature conditions.

5.4 HEAT/COLD STRESS MONITORING

Since site inspections, maintenance, and monitoring activities will be scheduled for both the summer and winter months, measures will be taken to minimize heat/cold stress to employees. The Site Health and Safety Coordinator or his/her designee will be responsible for monitoring employees for symptoms of heat/cold stress.

5.4.1 Heat Stress Monitoring

Personal protective equipment may place an employee at risk of developing heat stress, probably one of the most common (and potentially serious) illnesses encountered at sites requiring PPE. The potential for heat stress is dependent on a number of factors, including environmental conditions, clothing, workload, physical conditioning and age. Personal protective equipment may severely reduce the body's normal ability to maintain equilibrium (via evaporation, convection and radiation), and by its bulk and weight increases energy expenditure.

The signs and symptoms of heat stress are as follows:

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TABLE 5-2

PPE FOR EACH PROJECT TASK WITH AN IDENTIFIED HAZARD

1.	Conduct landfill gas monitoring (Level D): ▪ Work clothes or coveralls ▪ Rubber boots (pull-on) and safety shoes ▪ Safety glasses
2.	Sample groundwater, surface water, and sediment (Level D respiratory, Level C dermal): ▪ Tyvek Suit ▪ Chemical protective gloves (latex) ▪ Rubber boots (pull-on) and safety shoes ▪ Safety glasses
3.	Conduct site inspection and non-intrusive maintenance (Level D): ▪ Coveralls (or work clothes) ▪ Rubber boots (pull-on) and safety shoes ▪ Safety glasses
4.	Groundwater level monitoring (Level D respiratory, Level C dermal): ▪ Tyvek Suit ▪ Chemical protective gloves (latex) ▪ Rubber boots (pull-on) and safety shoes ▪ Safety glasses

- Heat rash may result from continuous exposure to heat or humid air.

- Heat cramps are caused by heavy sweating with inadequate electrolyte replacement. Signs and symptoms include:

  - muscle spasms
  - pain in the hands, feet and abdomen

- Heat exhaustion occurs from increased stress on various body organs including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms include:

  - pale, cool, moist skin
  - heavy sweating
  - dizziness
  - nausea
  - fainting

- Heat stroke is the most serious form of heat stress. Temperature regulation fails and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury and death occur. Competent medical help must be obtained. Signs and symptoms are:

  - red, hot, usually dry skin
  - lack of or reduced perspiration
  - nausea
  - dizziness and confusion
  - strong, rapid pulse
  - coma

The monitoring of personnel wearing protective clothing should commence when the ambient temperature is 70 degrees Fahrenheit or above. For monitoring the body's recuperative ability to excess heat, one or more of the following techniques should be used as a screening mechanism.

- Heart rate may be measured by the radial pulse for 30 seconds as early as possible in the resting period. The rate at the beginning of the rest period should not exceed 110 beats per minute. If the rate is higher, the next work period should be shortened by 10 minutes (or 33%), while the length of the rest period stays the same. If the pulse rate is 100 beats per minute at the

beginning of the next rest period, the following work cycle should be further shortened by 33%.

- Body temperature may be measured orally with a clinical thermometer as early as possible in the resting period. Oral temperature at the beginning of the rest period should not exceed 99.6 degrees Fahrenheit. If it does, the next work period should be shortened by 10 minutes (or 33%), while the length of the rest period stays the same. However, if the oral temperature exceeds 99.6 degrees Fahrenheit at the beginning of the next period, the following work cycle may be further shortened by 33%. Oral temperature should be measured again at the end of the rest period to make sure that it has dropped below 99.6 degrees Fahrenheit. No Malcolm Pirnie employee will be permitted to continue wearing semipermeable or impermeable garments when his/her oral temperature exceeds 100.6° Fahrenheit.

5.4.2 Cold Stress Monitoring

Exposure to cold conditions may result in frostbite or hypothermia, each of which progresses in stages as shown below.

- **Frostbite** occurs when body tissue (usually on the extremities) begins to freeze. The three states of frostbite are:

  1) **Frostnip** - This is the first stage of the freezing process. It is characterized by a whitened area of skin, along with a slight burning or painful sensation. Treatment consists of removing the victim from the cold conditions, removal of boots and gloves, soaking the injured part in warm water (102-108°F) and drinking a warm beverage.

  2) **Superficial Frostbite** - This is the second stage of the freezing process. It is characterized by a whitish-grey area of tissue which will be firm to the touch but will yield little pain. Treatment is identical to that for frostnip.

  3) **Deep Frostbite** - In this final stage of the freezing process the affected tissue will be cold, numb and hard, and will yield little to no pain. Treatment is identical to that for frostnip.

- **Hypothermia** occurs when the body loses heat faster than it can produce it. The stages of hypothermia (which may not be clearly defined or visible at first) are the following:

  1) Shivering

2) Apathy (a change to a disagreeable mood)
3) Unconsciousness
4) Bodily freezing
5) Death (if untreated)

Treatment of hypothermia is given below:

- Remove the victim from the cold environment and remove wet or frozen clothing. (Do this carefully as frostbite may have started.)
- Perform active re-warming with hot liquids for drinking (Note: do **not** give the victim any liquid containing alcohol or caffeine in this case) and a warm water bath (102-108°F)
- Perform passive re-warming with a blanket or jacket wrapped around the victim.

In any potential cold stress situation, it is the responsibility of the Site Health and Safety Officer to encourage the following:

- Workers should dress warmly, with more layers of thin clothing as opposed to one thick layer.
- Personnel should remain active and keep moving.
- Personnel should be allowed to take shelter in a heated area, as necessary.
- Personnel should drink warm liquids (no caffeine or alcohol if frostbite has set in).

5.5 EMERGENCY RESPONSE PLAN

Emergency medical treatment can be obtained at the Oswego Hospital in Oswego. Additionally, the Minetto Fire Department is located just beyond the site boundary.

Menter's Ambulance	(315) 592-4145 (315) 592-5365
Hospital Phone Number	(315) 349-5522

Directions to Hospital

- (See Figure 4.) Exit Columbia Mills and turn left (north) on Route 48. Proceed north towards Oswego. In Oswego, turn left onto Route 104 (W. Bridge Street). Turn left again on W. 6th Street.

Other Emergency Numbers

- Minetto Fire Department: (315) 343-5550
- Oswego County Sheriff: (315) 343-5490
- Nearest Phone: To Be Determined at Time of Work.

Non-Emergency

- Minetto Volunteer Fire Department (315) 343-7566

This information shall be posted in the on-site treatment trailer and in the field vehicle. It is the Site Safety Officer's responsibility to ensure that the information sheet is posted.

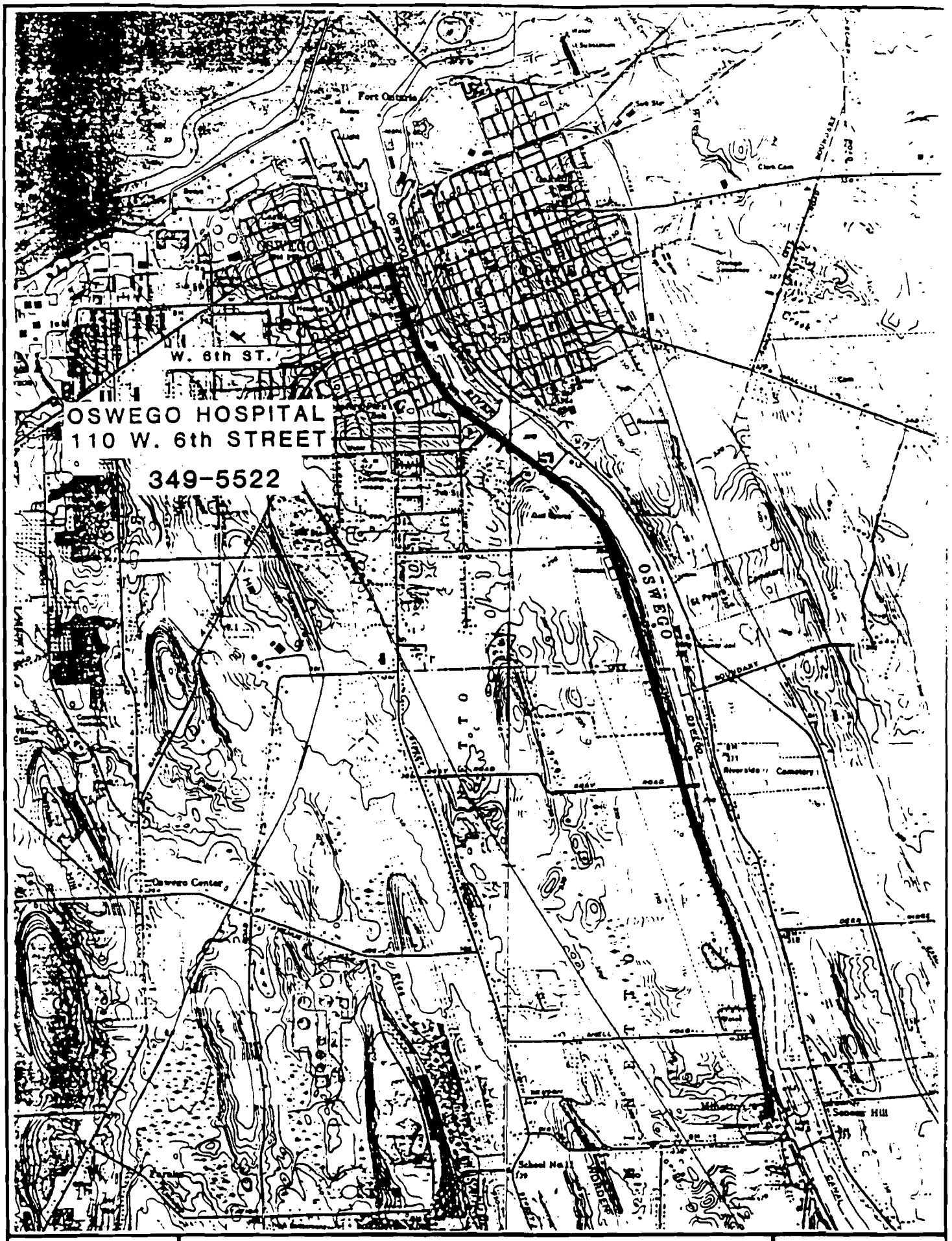

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FIGURE 4

ROUTE TO HOSPITAL

MALCOLM PIRNIE, INC.

DECEMBER 1992

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6.0 RECORD KEEPING AND REPORTING

6.1 MONTHLY REPORTING

A reporting procedure has been established to insure satisfactory site inspections and maintenance. A post-closure inspection report, in accordance with the parameters identified in this report, is provided as Appendix B.

As outlined in Section 2.0, one leachate/groundwater discharge sample will be collected monthly for the first year and quarterly thereafter from the combined discharge to the Amphibian Breeding Pond and analyzed for TCL volatile organics, total metals, cyanide, and field parameters. All specified data and inspection reports will be submitted to NYSDEC-Albany in letter report format following each sampling event.

6.2 YEAR ONE REPORTING

The first year of groundwater and sediment sampling, and landfill gas monitoring will be conducted as outlined in Section 2.0. As outlined in Section 2.3.6, a report summarizing the results of the annual and monthly/quarterly sampling events will be prepared and will include a summary of the apparent effectiveness of the remedial measures, including any observed trends in groundwater, leachate/groundwater discharge or sediment quality. In addition, the report will discuss the integrity of the cover system and infrastructure based on quarterly inspections as outlined in Section 3.0. This information shall be accompanied by a letter that summarizes the data, describes the reporting period and notifies the State of any problems/corrective measures taken.

6.3 SUBSEQUENT REPORTING

After the first year, leachate/groundwater discharge sampling will be conducted quarterly and sediment samples will be collected every five years. As well, the necessity of

landfill gas monitoring will be evaluated. Formal quarterly inspection will not be necessary, however, annual written inspections will be required.

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7.0 REFERENCES

Northeast Regional Climate Center, 1993. "Atlas of Precipitation Extremes for the Northeastern United States and Southeastern Canada." Cornell University Publication No. RR93-5.

Malcolm Pirnie, Inc., 1997. "Columbia Mills Landfill, Final Remediation Report, NYS Dept. of Environmental Conservation Site No. 07-38-012."

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APPENDIX A

STANDARD OPERATING PROCEDURES

Appendix A.1 — Groundwater Sampling

Appendix A.2 — Surface Water Sampling (Leachate/Groundwater Discharge Sampling)

Appendix A.3 — Sediment Sampling in Shallow Water

Appendix A : Item 1 - GROUND WATER SAMPLING

Applicability: GENERAL Revision No.: ____ Date: _____

Prepared By: MKR Date: 11/27/89 Approved By: GHF Date: 12/6/89

1.0 INTRODUCTION

This guideline presents a method for collecting a ground water sample after the monitoring well has been purged and has sufficiently recovered. Sampling should be carried out according to the following protocol:

2.0 METHODOLOGY

1. Perform sampling as soon as practical after purging at any time after the well has recovered sufficiently to sample, or within 24 hours after evacuation, if the well recharges slowly. If the well does not yield sufficient volume for all required laboratory analytical testing (including quality control), a decision should be made to prioritize analyses based on contaminants of concern at the site. Analyses will be prioritized in the order of the parameters volatilization sensitivity. After volatile organics have been collected, field parameters must be measured from the next sample collected. If a well takes longer than 24 hours to recharge, the Project Manager should be consulted.

2. Following purging and recharging the well, collect samples into appropriate containers using a stainless steel or disposable polypropylene bailer. The bailer should be equipped with a leader made of Teflon, stainless steel wires or single strand polypropylene monofilament of at least ten feet long which is attached to a new, dedicated 1/4-inch nylon rope. The bailer should be lowered slowly below the surface of the water so as to allow the water to touch only the "leader" and not the nylon rope. Prior to its use in the field, the stainless steel bailer and "leader" should be cleaned according to decontamination protocols specified for the program.

3. Prelabel all sample bottles in the field using a waterproof permanent marker. The following information should be included on the label:

   - Site name

- Sample identification code
- Project number
- Date/time of sample collection (month, day, year)
- Sampler's initials
- Preservation added (if any)
- Analysis to be performed

4. Collect samples into pre-cleaned bottles provided by the analytical laboratory with the appropriate preservative(s) added, and the samples placed in coolers for shipment to the designated laboratory. Chain of custody procedures should be adhered to upon sample collection.

5. Collect a separate sample of approximately 200 mls into an appropriate container to measure pH, conductivity, temperature and turbidity in the field.

6. Record well sampling data in the Project Field Book or on the attached "Water Sampling Field Data Sheet."

3.0 REFERENCES

(a) USEPA, September 1986, RCRA Groundwater Monitoring Technical Enforcement Guidance Document.

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WATER SAMPLING FIELD DATA SHEET

PROJECT: _____ TYPE OF SAMPLE: _____

CLIENT: _____ LOCATION NO.: _____

JOB NO.: _____ LAB SAMPLE NO.: _____

WELL DATA: DATE: _____ TIME: _____

Casing Diameter (inches): _____ Casing Material: _____

Screened Interval (ft BGS): _____ Screen Material: _____

Static Water Level Below TOR (ft): _____ Bottom Depth (ft): _____

Elevation Top of Well Riser: _____ Datum Ground Surface: _____

PURGING DATA: DATE: _____ TIME: Start: _____ Finish: _____

Method: _____ Pumping Rate (gal/min): _____

Well Volumes Purged ($V=\pi R^2H/231$): _____ Was well purged dry? _____ Yes _____ No

Standing Volume (gal): _____ Was well purged below sand pack? ___ Yes ___ No

Volume Purged (gal): _____

Well I.D. (inches)	Volume (gal/ft)
2	0.17
4	0.66
6	1.50

Is purging equipment dedicated to sample location?

Yes _____ No _____

Field Personnel: _____

SAMPLING DATA: DATE: _____ TIME: Start: _____ Finish: _____

Method: _____ Sampler: _____

Present Water Level (ft): _____ Air Temperature (°F): _____

Depth of Sample (ft): _____ Weather Conditions: _____

Is sampling equipment dedicated to sample location? Yes _____ No _____

PRESERVATION DATA: DATE: _____ TIME: Start: _____ Finish: _____

Filtered: _____ Yes _____ No Cool to 4°C: _____

Preservative: _____ H_2SO_4 _____ HNO_3 _____ NaOH _____ Other

PHYSICAL AND CHEMICAL DATA:

Appearance: Clear: _____ Turbid: _____ Color: _____

Contains Sediment: _____ Odor: _____ Other: _____

Temperature (°C): _____ pH: _____ Specific Conductivity (μmhos/cm): _____

Turbidity (NTU): _____ Other: _____

REMARKS:

Appendix A : Item 2 - SURFACE WATER SAMPLING - ADAPTED FOR LEACHATE/GROUNDWATER DISCHARGE SAMPLING

Applicability: GENERAL Revision No.: ____ Date: _____

Prepared By: MKR Date: 1/18/90 Approved By: KLB Date: 2/2/90

1.0 INTRODUCTION

This guideline presents a method for the collection of surface water samples and will be used for the collection of the leachate/groundwater discharge. The most widely used method for collection involves a sampler consisting of an adjustable clamp attached to the end of a two or three piece telescoping aluminum tube that serves as the handle. The clamp is used to secure a precleaned laboratory sample bottle. Using the sample bottle for actual sampling eliminates the need for other equipment. This method also reduces the risk of introducing other variables into a sampling event.

2.0 METHODOLOGY

1. Assemble the sampler. Make sure that the sample bottle and the bolts and nuts that secure the clamp to the pole are tightened properly.

2. With proper protective garment and gear, take a grab sample by slowly submerging the sample bottle with minimal surface disturbance.

3. Collect sample from the ABP inlet pipe. If invert is submerged, collect sample from upstream manhole.

4. Retrieve the sampler from the discharge with minimal disturbance. (If sample bottles were not used for sample collection, carefully transfer the water samples to appropriate precleaned sample bottles).

5. Cap the sample bottle and remove from the sampler. Follow procedures for preservation, if required, and sample handling.

6. Dismantle the sampler and store in plastic bags for subsequent decontamination.

7. Record available information for the pond, stream or other body of water that was sampled, such as its size, location and depth in the Project Field Book. Approximate sampling points should be identified on a sketch of the water body.

3.0 REFERENCES

New Jersey Department of Environmental Protection, 1988, Field Sampling Procedures Manual: Bureau of Environmental Measurements and Quality Assurance CN 028, 414 p.

042

Appendix A : Item 3 - SEDIMENT SAMPLING IN SHALLOW WATERS

Applicability: GENERAL Revision No.: ____ Date: _____

Prepared By: THF Date: 07/23/93 Approved By: ___ Date: _____

1.0 INTRODUCTION

This guideline presents a method for collection of sediment samples in shallow waters. The most widely used method for collection involves a sampler consisting of a Type 304 stainless steel corer fitted with a cellulose acetate sample sleeve, which is driven into the sediment by hand to obtain a 2-inch diameter sample core.

2.0 METHODOLOGY

1. Assemble the sampler. Make sure that the handle and extension rods are tightened securely. Insert a new cellulose acetate sleeve in the sampler end.

2. If samples are to be collected from a stream, creek or other running water body, collect downstream samples first to minimize impacts on sample quality.

3. With proper job-specific protective garment and gear, collect a grab sample by slowly driving the sampler through the water approximately 2-3 inches into the sediments, being careful to minimize disturbance at the sediment/water interface.

4. Retrieve the sample by twisting the sampler and gently pulling upward on the handle, again being sure to minimize disturbance at the sediment/water interface.

5. If no sediment is retrieved due to the presence of soft, non-consistent sediments, replace the standard sleeve with an eggshell-type cellulose acetate sleeve. This type of sleeve remains open on bottom while the sampler is being driven into the sediments, but closes when the sampler is removed to trap the soft sediment.

6. Remove the sleeve from the sampler and transfer to contents to the appropriate pre-cleaned sample jars using a stainless steel trowel. Repeat the collection procedure as necessary immediately adjacent to the previous sampling point until adequate sample volume is obtained.

7. Follow procedures for preservation, if required, and sample handling.

8. Clean the sleeve and sampler using a non-phosphate soap solution and deionized rinse water prior to use at the next location.

9. Record pertinent information for the sample, such as location and depth, in the Project Field Notebook.

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APPENDIX B

HISTORICAL ANALYTICAL RESULTS

TABLE 2-4

COLUMBIA MILLS LANDFILL REMEDIATION
MINETTO, NEW YORK

WATER SAMPLE ANALYSIS RESULTS FROM COMBINED DISCHARGE INTO POND

Analysis Parameter	Effluent Criteria	Sample Location and Date Collected					
		Effluent #1 (6/21/96)	Effluent #2 (6/25/96)	Effluent #3 (7/1/96)	Effluent #4 (7/8/96)	Effluent #5 (7/15/96)	Effluent #6 7/22/96)
Total Cyanide	0.06 mg/l	<0.01 mg/l	<0.01 mg/l	<0.01 mg/l	<0.01 mg/l	<0.01 mg/l	<0.01 mg/l
Total Suspended Solids	10 mg/l	<1 mg/l	1 mg/l	3 mg/l	<1 mg/l	<1 mg/l	<1 mg/l
Total Aluminum	0.1 mg/l	<0.05 mg/l	<0.05 mg/l	<0.05 mg/l	<0.05 mg/l	0.08 mg/l	<0.05 mg/l
Total Antimony	0.8 mg/l	<0.3 mg/l	<0.3 mg/l	<0.3 mg/l	<0.3 mg/l	<0.3 mg/l	<0.3 mg/l
Total Barium	0.3 mg/l	<0.3 mg/l	<0.3 mg/l	<0.3 mg/l	<0.3 mg/l	<0.3 mg/l	<0.3 mg/l
Total Cadmium	0.014 mg/l	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	0.014 mg/l	0.011 mg/l
Total Chromium	0.5 mg/l	<0.05 mg/l	<0.05 mg/l	<0.05 mg/l	<0.05 mg/l	<0.05 mg/l	<0.05 mg/l
Total Copper	0.1 mg/l	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l
Total Iron	0.3 mg/l	<0.03 mg/l	<0.03 mg/l	<0.03 mg/l	<0.03 mg/l	<0.03 mg/l	<0.03 mg/l
Total Lead	0.33 mg/l	<0.1 mg/l	<0.1 mg/l	<0.1 mg/l	<0.1 mg/l	<0.1 mg/l	<0.1 mg/l
Total Magnesium	—	---	---	—	—	—	—
Total Manganese	4.0 mg/l	0.23 mg/l	0.33 mg/l	0.33 mg/l	0.59 mg/l	0.78 mg/l	0.65 mg/l
Total Zinc	0.4 mg/l	0.1 mg/l	0.09 mg/l	0.1 mg/l	0.11 mg/l	0.11 mg/l	0.11 mg/l
Dissolved Copper	monitor	<0.02 mg/l	<0.02 mg/l	0.02 mg/l	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l
Toluene	0.01 mg/l	<3 ug/l	<3 ug/l	<3 ug/l	<3 ug/l	<3 ug/l	<3 ug/l
Trichloroethene	0.01 mg/l	<3 ug/l	<3 ug/l	<3 ug/l	<3 ug/l	<3 ug/l	<3 ug/l
Methyl Ethyl Ketone	monitor	<10 ug/l	<10 ug/l	<10 ug/l	<10 ug/l	<10 ug/l	<10 ug/l

TABLE 2-4

COLUMBIA MILLS LANDFILL REMEDIATION
MINETTO, NEW YORK

WATER SAMPLE ANALYSIS RESULTS FROM COMBINED DISCHARGE INTO POND

Analysis Parameter	Effluent Criteria	Sample Location and Date Collected					
		Effluent #7 (7/29/96)	Effluent #8 (8/5/96)	Effluent #9 (8/12/96)	Effluent #10 (8/19/96)	Effluent #11 (8/26/96)	Effluent #12 (9/3/96)
Total Cyanide	0.06 mg/l	<0.01 mg/l	<0.01 mg/l	<0.01 mg/l	<0.01 mg/l	<0.01 mg/l	<0.01 mg/l
Total Suspended Solids	10 mg/l	2 mg/l	1 mg/l	2 mg/l	<1 mg/l	2 mg/l	<1 mg/l
Total Aluminum	0.1 mg/l	<0.05 mg/l	<0.05 mg/l	<0.05 mg/l	<0.05 mg/l	<0.05 mg/l	<0.05 mg/l
Total Antimony	0.8 mg/l	<0.3 mg/l	<0.3 mg/l	<0.3 mg/l	<0.3 mg/l	<0.3 mg/l	<0.3 mg/l
Total Barium	0.3 mg/l	<0.3 mg/l	<0.3 mg/l	<0.3 mg/l	<0.3 mg/l	<0.3 mg/l	<0.3 mg/l
Total Cadmium	0.014 mg/l	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l
Total Chromium	0.5 mg/l	<0.05 mg/l	<0.05 mg/l	<0.05 mg/l	<0.05 mg/l	<0.05 mg/l	<0.05 mg/l
Total Copper	0.1 mg/l	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l
Total Iron	0.3 mg/l	<0.03 mg/l	<0.03 mg/l	<0.03 mg/l	<0.03 mg/l	<0.06 mg/l	0.04 mg/l
Total Lead	0.33 mg/l	<0.1 mg/l	<0.1 mg/l	<0.1 mg/l	<0.1 mg/l	<0.1 mg/l	<0.1 mg/l
Total Magnesium	---	---	---	---	---	---	---
Total Manganese	4.0 mg/l	0.91 mg/l	1.1 mg/l	1.1 mg/l	1.3 mg/l	1.7 mg/l	2.1 mg/l
Total Zinc	0.4 mg/l	0.10 mg/l	0.09 mg/l	0.10 mg/l	0.09 mg/l	0.10 mg/l	0.09 mg/l
Dissolved Copper	monitor	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l
Toluene	0.01 mg/l	<3 ug/l	<3 ug/l	<3 ug/l	<3 ug/l	<3 ug/l	<3 ug/l
Trichloroethene	0.01 mg/l	<3 ug/l	<3 ug/l	<3 ug/l	<3 ug/l	<3 ug/l	<3 ug/l
Methyl Ethyl Ketone	monitor	<10 ug/l	<10 ug/l	<10 ug/l	<10 ug/l	<10 ug/l	<10 ug/l

TABLE 2-4

COLUMBIA MILLS LANDFILL REMEDIATION
MINETTO, NEW YORK

WATER SAMPLE ANALYSIS RESULTS FROM COMBINED DISCHARGE INTO POND

Analysis Parameter	Effluent Criteria	Sample Location and Date Collected				
		Effluent #13 (9/9/96)	Effluent #14 (9/16/96)	Effluent #15 (9/24/96)	Effluent #16 (10/1/96)	Effluent #17 (10/8/96)
Total Cyanide	0.06 mg/l	<0.01 mg/l	<0.01 mg/l	<0.01 mg/l	<0.01 mg/l	0.02 mg/l
Total Suspended Solids	10 mg/l	3 mg/l	<1 mg/l	2 mg/l	<1 mg/l	2 mg/l
Total Aluminum	0.1 mg/l	0.22 mg/l	<0.05 mg/l	<0.05 mg/l	<0.05 mg/l	0.06 mg/l
Total Antimony	0.8 mg/l	<0.3 mg/l	<0.3 mg/l	<0.3 mg/l	<0.3 mg/l	<0.3 mg/l
Total Barium	0.3 mg/l	<0.3 mg/l	<0.3 mg/l	<0.3 mg/l	<0.3 mg/l	<0.3 mg/l
Total Cadmium	0.014 mg/l	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l	<0.005 mg/l
Total Chromium	0.5 mg/l	<0.05 mg/l	<0.05 mg/l	<0.05 mg/l	<0.05 mg/l	<0.05 mg/l
Total Copper	0.1 mg/l	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l
Total Iron	0.3 mg/l	0.39 mg/l	0.22 mg/l	0.06 mg/l	0.08 mg/l	0.07 mg/l
Total Lead	0.33 mg/l	<0.1 mg/l	<0.1 mg/l	<0.1 mg/l	<0.1 mg/l	<0.1 mg/l
Total Magnesium	—	—	—	—	—	—
Total Manganese	4.0 mg/l	0.56 mg/l	2.8 mg/l	2.2 mg/l	2.5 mg/l	2.8 mg/l
Total Zinc	0.4 mg/l	0.07 mg/l	0.12 mg/l	0.09 mg/l	0.13 mg/l	0.10 mg/l
Dissolved Copper	monitor	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l
Toluene	0.01 mg/l	<3 ug/l	<3 ug/l	<3 ug/l	<3 ug/l	<3 ug/l
Trichloroethene	0.01 mg/l	<3 ug/l	<3 ug/l	<3 ug/l	<3 ug/l	<3 ug/l
Methyl Ethyl Ketone	monitor	<10 ug/l	<10 ug/l	<10 ug/l	<10 ug/l	<10 ug/l

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APPENDIX C

POST-CLOSURE INSPECTION REPORT

COLUMBIA MILLS, INC.
COLUMBIA MILLS LANDFILL

POST-CLOSURE INSPECTION REPORT

DATE: _____
WEATHER: _____
PERSONNEL: _____

Instructions: Complete the checklist of visual evaluation items then complete specific data items. Field Measurements should be made with a cloth tape, provided instrumentation on equipment or other suitable means. Estimated measurements shall be so noted. Attach hand sketches or photographs to further define conditions or problems.

I. VISUAL EVALUATION ITEMS	CONDITION (Check) Acceptable	Not Acceptable	Not Present	Present	Remarks
1. Vegatative Cover					
a. Within Landfill Disposal Area					
b. Around Landfill Perimeter					
2. Integrity of Drainage Ditches					
a. Sediment Build-up					
b. Pooling or Ponding					
c. Slope Integrity					
d. Drainage Grates					
e. Storm Water Pipe					
f. Overall Adequacy					
3. Integrity of Gas Vents					
4. General Condition of Site					
a. Road Condition					
b. Gates/Fences/Locks					
c. Grass Height					
d. Illegal dumping					
5. Integrity of Groundwater					
6. Integrity of Landfill Cap					
a. Erosion Damage					
b. Leachate Breakthrough					
c. Settlement					
d. Cracking					
e. Slope					
f. Undesirable plants or animals					
7. Condition of Aquatic Breeding Pond					
a. Vegetation					
b. Aquatic population					

II. SPECIFIC DATA ITEMS (Write N.A. if not applicable) (continued)

A. Erosion and Settlement:

1. Approximate size in feet of cap eroded area(s). (List separtely)
   a. ___ feet by ___ feet
   b. ___ feet by ___ feet
   c. ___ feet by ___ feet

2. How deep is the most extreme point of erosion when measured from the adjacent surface. (List separately).
   a. ___ feet
   b. ___ feet
   c. ___ feet

3. Approximate size in feet of eroded areas outside the soil cap area such as drainage ditches, roads or slopes.

4. Attach a hand sketch or photograph showing the location of the eroded area(s). Identify each area by using the letter a, b, c, etc. from Question 1.

5. Approximate size in feet of leachate breakouts. (List separately).
   a. ___ feet by ___ feet
   b. ___ feet by ___ feet
   c. ___ feet by ___ feet

6. Approximate size in feet of any settlement areas within the soil cap area. (List separtely).
   a. ___ feet by ___ feet
   b. ___ feet by ___ feet
   c. ___ feet by ___ feet

7. Approximate depth of each settlement area when measured from the adjacent surface. (List separtely).
   a. ___ feet
   b. ___ feet
   c. ___ feet

8. Attach a hand sketch or photograph showing the location of the settlement area(s). Identify each area by using the letter a, b, c, etc. from Question 6.

B. Corrective Actions:

1. Describe corrective actions taken (write N.A. in not applicable).

2. Date of corrective action: _____

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APPENDIX D

RECORD DRAWINGS

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Due to the voluminous nature of the record drawings, they are provided separately.

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APPENDIX E

HEALTH AND SAFETY PLAN

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APPENDIX E

POST CLOSURE OPERATIONS, MAINTENANCE AND MONITORING PLAN FOR COLUMBIA MILLS LANDFILL

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APPENDIX E

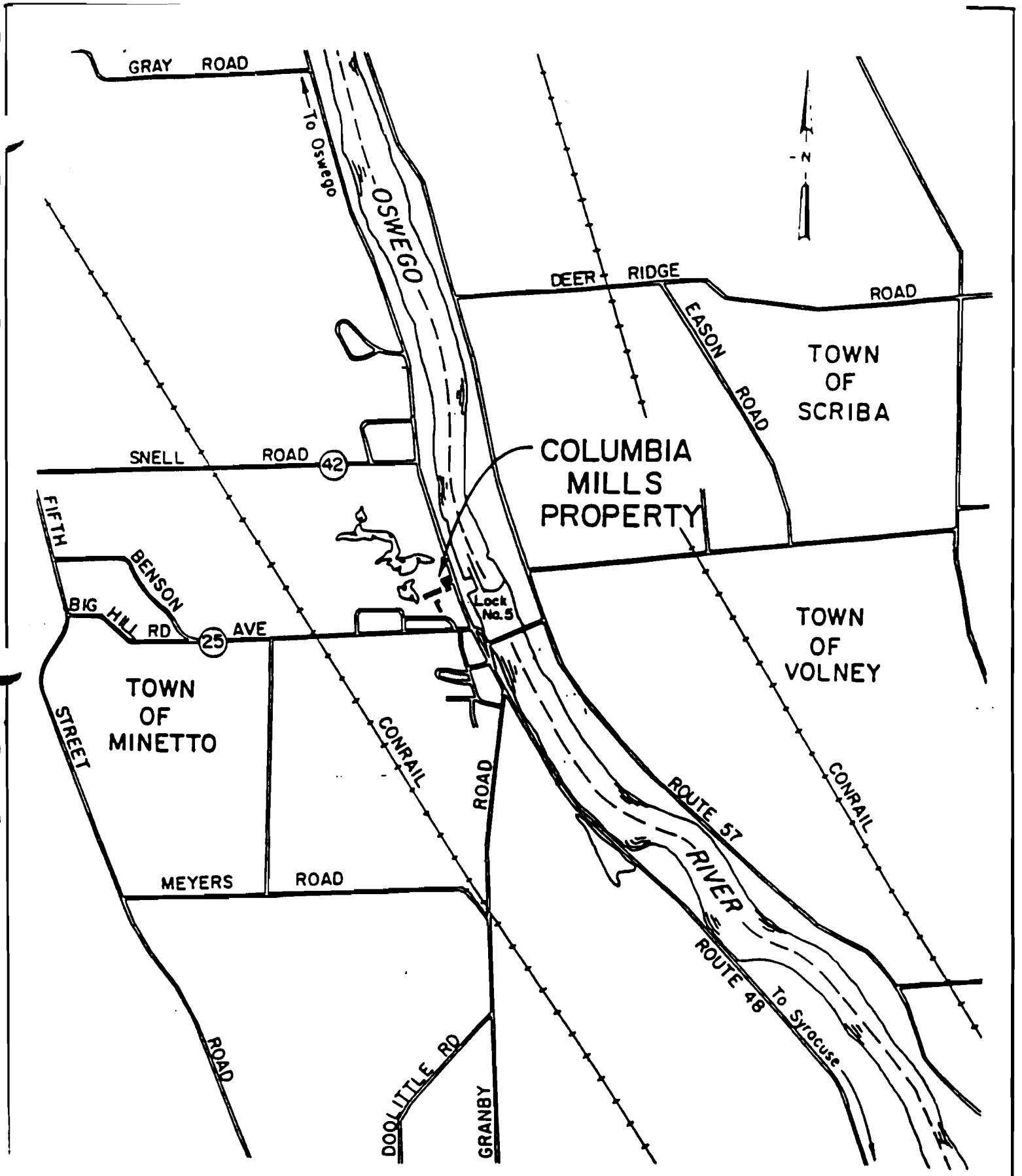
1.0 HEALTH AND SAFETY PLAN

This Health and Safety Plan (HASP) has been prepared for informational purposes only. It addresses those site-specific hazards which, at the time of this post-closure monitoring plan development, may potentially be encountered while performing the post-closure maintenance and monitoring tasks described herein. Neither NYSDEC nor Malcolm Pirnie accept responsibility for the Health and Safety of any individuals other than their own employees. Site representatives, contractors, or any other persons performing work at the site shall be required to provide their own site-specific HASP covering their employees and subcontractors.

1.1 SITE LOCATION AND BACKGROUND

The Columbia Mills site (Registry #738012) is located in the Town of Minetto, in New York State (see Figures 1 and 2). Columbia Mills, Inc. was a manufacturer of coated cloth and vinyl products from 1887 until the plant was closed in 1976. After the plant ceased to operate, the property was sold to Columin Development Corporation, who initiated salvage operations. For economic reasons, the salvaging ended prematurely and Columin defaulted on property taxes. Ownership of the site was then transferred to the County of Oswego.

Prior to remediation, the site consisted of approximately 10 acres of standing structures, partially and completely demolished buildings and rubble (the main plant area), and approximately 40 acres of undeveloped property. This undeveloped property included several ponds, streams, and the plant's former landfill. A remedial investigation and feasibility study (RI/FS) conducted at the site by Malcolm Pirnie, Inc., on behalf of Columbia Mills, identified areas of contamination and determined remedial actions to be undertaken. Following completion of the RI/FS, Malcolm Pirnie completed capping and closure of the former drum disposal area at the site.



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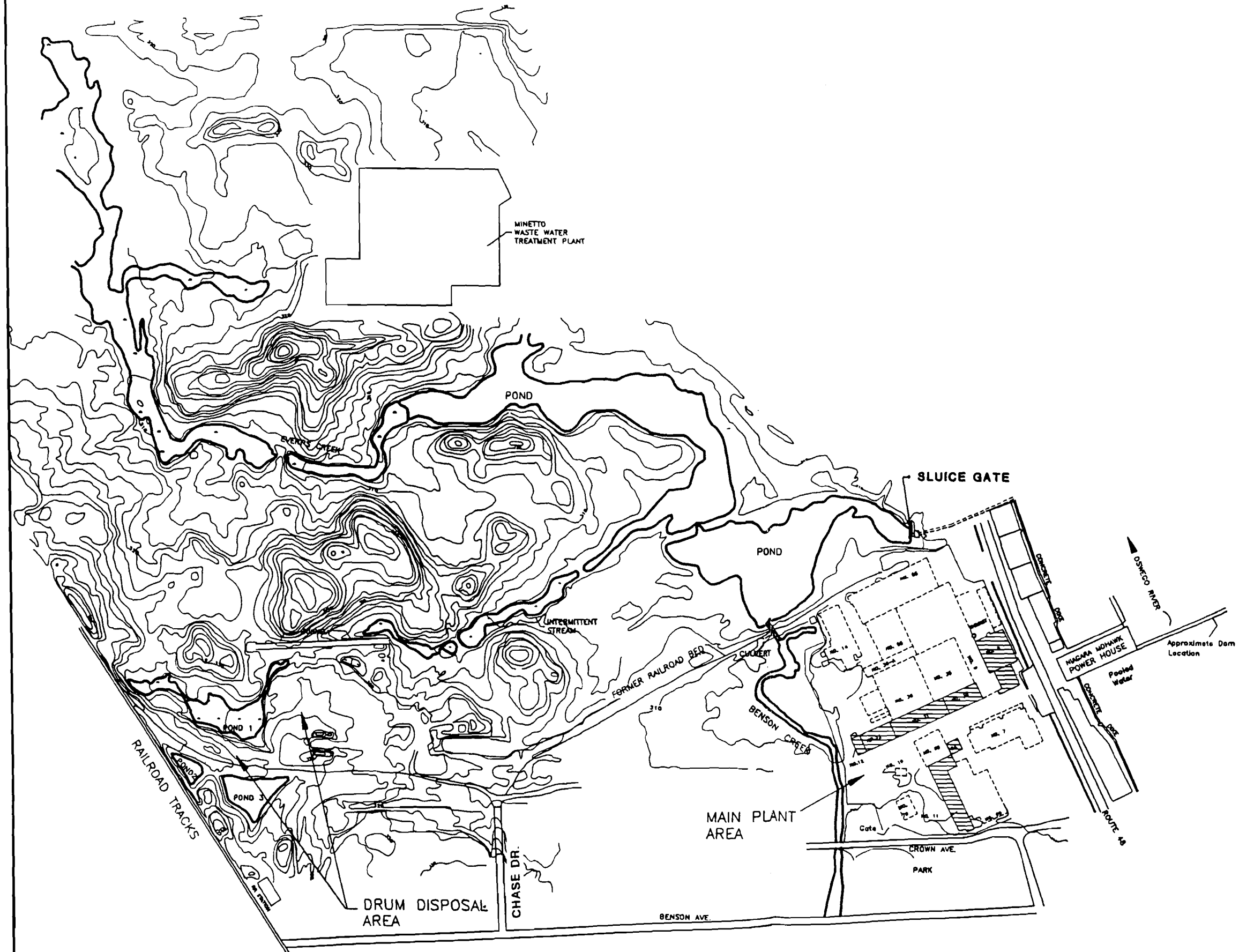
COLUMBIA MILLS
SITE LOCATION MAP

FIGURE 1

APRIL 1989

SCALE: 1" = 2000'



COLUMBIA MILLS

SITE MAP

MALCOLM PIRNIE	Date	Figure No.
	October 1991	2

1.2 PURPOSE

The purpose of this HASP is to provide guidelines and establish procedures for the protection of approved personnel performing the following tasks at the site:

- Site inspections and maintenance.
- Groundwater, leachate/groundwater discharge, and sediment sampling.
- Landfill gas monitoring.
- Groundwater level monitoring.

All on-site personnel will be required to be familiar with the procedures and requirements of this HASP.

Contractors whose work will be performed on-site, or who otherwise could be exposed to health and safety hazards, will be advised of all known hazards through distribution of site-specific information. Contractors shall be solely responsible for the health and safety of their employees and shall comply with all applicable laws and regulations. All contractors and subcontractors are responsible for: (1) developing their own HASP including a written Hazard Communication Program (HCP) and any other written hazard specific programs required by Federal, State, and local laws; (2) providing their own personal protection equipment (PPE); (3) providing documentation that their employees have been trained in accordance with applicable Federal, State, and local laws; (4) providing evidence of medical surveillance and medical approvals for their employees; and (5) designating their own site safety officer.

1.3 PROJECT ORGANIZATION AND KEY PERSONNEL

The Project Manager, the Health and Safety Officer and the Site Health and Safety Coordinator (or his/her designee) identified below will determine and enforce compliance.

- PROJECT MANAGER

Name: _____

Telephone: Office: _____

Home: _____

- CORPORATE HEALTH AND SAFETY MANAGER

  Name: _____
  Telephone: Office: _____
  Home: _____

- SITE HEALTH AND SAFETY OFFICER

  Name: _____
  Telephone: Office: _____
  Home: _____

- SITE HEALTH AND SAFETY COORDINATOR

  Name: _____
  Telephone: Office: _____
  Home: _____

The following roles have been identified for project personnel:

Project Manager - The Project Manager has full responsibility for implementing and executing an effective program of employee protection and accident prevention. He/She may delegate authority to expedite and facilitate any application of the program.

Health and Safety Manager - The Health and Safety Manager serves as the administrator of the corporation's health and safety program. He/She is responsible for ensuring that field personnel are properly trained, that they have obtained medical clearance to wear respiratory protection (per 29 CFR Part 1910.134(b)(10)), and that they are properly trained in the selection, use and maintenance of PPE, including qualitative respirator fit testing.

The Health and Safety Manager will also serve as scientific advisor for the duration of the project, providing guidance on data interpretation and the determination of appropriate levels of worker protection.

Site Health and Safety Officer - The Site Health and Safety Officer is knowledgeable in safety and worker protection techniques as they relate to the project. Responsibilities include the development of the specific provisions of this HASP, including the level of personnel protection to be employed, identification of emergency procedures, and personnel/equipment decontamination procedures. This individual will provide technical

assistance to project management on problems relating to industrial hygiene and work site safety.

Any health and safety briefings required during the course of the project will be conducted by the Site Health and Safety Officer. Examples of briefings might include accident prevention, respirator refresher courses or current issues. The frequency of safety briefings will be based upon the potential hazards specific to the designated work tasks and any new information relative to such hazards which are discovered during the project.

Site Health and Safety Coordinator - The Site Health and Safety Coordinator or his/her designee will be responsible for enforcement of this HASP for employees at the site and for monitoring the personal exposures of employees to hazardous substances contained in air, soil or water. This will consist of spot checking workplace air sampling performed by the Subcontractor such as organic vapor monitoring and the documentation of such data. The Site Health and Safety Coordinator or his/her designee will communicate directly with the Site Health and Safety Officer on a regular basis to advise him/her of monitoring results and any unexpected conditions found at the site. As data are received and evaluated, the Site Health and Safety Officer will adapt this HASP to fit the current employee protection needs at the site. All affected employees and the Subcontractor's designated Site Health and Safety Officer (if any) will be informed of the air sampling results.

When unsafe work conditions are identified, the Site Health and Safety Coordinator or his/her designee is authorized to order his/her personnel to stop work. Resolution of all on-site health and safety problems will be coordinated through the Project Manager with assistance from the Health and Safety Manager and Site Health and Safety Officer as well as the Subcontractor's designated Health and Safety personnel.

1.4 HAZARD EVALUATION

1.4.1 Summary of Projected Risks

Based on the results of previous site investigations, potential hazards have been identified for each work task involved. These hazards are listed in Table 1-1. The principal points of exposure would be through direct contact with contaminated fill/soils and

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TABLE 1-1

PROJECT TASKS WITH POTENTIAL HAZARDS

Project Task	Potential Hazards
1. Conduct site inspections and maintenance.	Exposure to contaminants: dermal, oral, and inhalation. Physical hazards.
2. Sample groundwater, leachate/groundwater discharge, and sediment.	Exposure to contaminants: dermal, oral and inhalation. Physical hazards.
3. Conduct landfill gas monitoring.	Exposure to contaminants: inhalation. Physical hazards.
4. Groundwater level monitoring.	Exposure to contaminants: inhalation. Physical hazards.

groundwater, through the inhalation of contaminated particles or vapors. Since work will be performed during summer/winter time periods, the potential exists for heat/cold stress to impact workers especially those wearing protective equipment and clothing.

Although no work can be considered completely risk-free, logical and reasonable precautions will be implemented to provide an adequate level of protection for workers. The integration of medical evaluations, worker training relative to chemical hazards, safe work practices, proper personal protection, environmental monitoring, work zones and site control, appropriate decontamination procedures and contingency planning into the project approach will minimize the chance of unnecessary exposures and physical injuries.

1.4.2 Physical Hazards

Field reconnaissance activities may present the following physical hazards:

- The potential for heat/cold stress to employees during the summer/winter months (see Section 5.10).
- The potential for slip-and-fall injuries due to rough, uneven terrain.
- The potential for injury if a landfill gas or waste fire is experienced.

1.4.3 Chemical Hazards

Table 1-2 lists the contaminants of concern and their levels detected in the soil, groundwater, surface water, and sediment present in the drum disposal area at the site and the intermittent stream originating in this disposal area.

The primary routes of exposure to the contaminants found on the site are through inhalation of dusts and by direct contact.

Inhalation: Table 1-3 contains Permissible Exposure Limits (PELs) and Threshold Limit Values (TLVs) for the site inhalation hazards detected in the samples collected from the areas of the site to be addressed by the remedial action. PELs are Occupational Safety and Health Administration (OSHA) standards while TLVs are guidance values from the American Council of Governmental Industrial Hygienists. Exposure to respirable dust shall be controlled by air monitoring and use of respiratory protection.

TABLE 1-2
Columbia Mills
Analytes/Maximum Concentrations Detected

A. DRUM DISPOSAL AREA

CHEMICAL	MAXIMUM CONCENTRATION DETECTED			
	SOIL (mg/kg)	GROUND WATER (mg/l)	SURFACE WATER* (µg/l)	SEDIMENT** (mg/kg)
VOLATILE ORGANICS				
Chloroform		0.11	2	
1,1-Dichloroethylene		0.004		
Methylene Chloride	0.011(TP)	0.026	4.5	
Methyl ethyl ketone		0.018		
Toluene	0.37(SS)	0.005		
1,1,1-Trichloroethane		0.002	1	
Trichloroethylene		0.003		
SEMIVOLATILES				
Acenaphthylene	1(SS)			
Anthracene	0.25(TP)			
Benzo(a)anthracene	0.80(SS)	0.002		
Benzo(a)pyrene	0.85(SS)	0.001		
Benzo(b)/(k)fluoroanthene	1.2(TP)	0.0019		
Benzo(e)pyrene	0.43(TP)			
Benzo(g,h,i)perylene	0.5(TP)			
Bis(2-ethylhexyl)phthalate	280(SS)			0.71
Chrysene	0.87(SS)	0.002		
Dibutyl phthalate	18(SS)	0.002		
Fluoranthene	4(SS)	0.003		
Indeno(1,2,3-cd)pyrene	0.5(TP)			
2-Methyl phenol	0.47(SS)			
Phenanthrene	1.2(TP)	0.002		
Phenol	3(SS)			
Pyrene	9(SS)	0.003		0.4
TENTATIVELY IDENTIFIED COMPOUNDS				
Acetic acid, butyl ester	0.35(SS)			
1,2-Benzindicarboxylic acid	0.011(SS)			
Carboxylic acid	0.71(SS)			3.4
1,3-Cyclopentadiene	0.44(SS)			
Decane	0.3(SS)			
2-Ethyl-1-hexanol	1			
Heptanol	0.39(SS)			
Hexadecanoic acid,methyl ester	0.23(TP)			
Nonanoic acid	4.8(TP)			
4-Methyl-2-heptanone	0.27(SS)			
Octanoic acid	1.2(TP)			
1-Propene-1,2,3-tricarboxylic acid	0.55(SS)			
2-Tridecanone	0.28(SS)		1	

TABLE 1-2
Columbia Mills
Analytes/Maximum Concentrations Detected

A. DRUM DISPOSAL AREA

CHEMICAL	MAXIMUM CONCENTRATION DETECTED			
	SOIL (mg/kg)	GROUND WATER (mg/l)	SURFACE WATER* (µg/l)	SEDIMENT** (mg/kg)
INORGANICS				
Aluminum	11,600(SS)	7.22		6,130
Antimony	138(TP)	0.074		13.5
Arsenic	19.2(TP)			1.5
Barium	167(SS)	0.238		
Cadmium	65(SS)	0.120	25	23.2
Calcium		56.3		4,620
Chromium	4,200(SS)	0.900	2.0	200
Chromium (hex)	3.3(TP)		0.010	
Cobalt	20(SS)			
Copper	10,000(SS)	2.5	0.8	590
Cyanide	36.9(TP)	0.218		
Iron	72,900(TP)	65		12,300
Lead	65,000(SS)	58	700	13,000
Magnesium	5,210(TP)	17.7		971
Manganese	534(TP)	4.55		408
Nickel	1,250(SS)	14	7	130
Selenium				4.7
Sodium		12.9		
Silver	0.6(SS)			4.0
Vanadium	18			
Zinc	69,000	22	20,000	7,800
PESTICIDES				
4,4'-DDD				0.043
4,4'-DDE		0.012		0.040
4,4'-DDT		0.016		
PCBs	0.3(SS)			
DIOXINS				
TCDD	0.00022			
PeCDD	0.00022			
HxCDD	0.00043			
HpCDD	0.0011			
OCDD	0.0021			
FURANS				
2,3,7,8-TCDF	0.00060			
TCDF	0.0016			
PeCDF	0.0021			
HxCDF	0.0010			
HpCDF	0.0071			
OCDF	0.0011			

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Section A Notes:

This data has been updated through 8/17/93.

*– Surface Water samples were analyzed for volatile organics only.

**– Sediment in Ponds 1,2 and 3 in Drum Disposal Area.

TP – Test Pit Sample

SS – Surface Soil Sample

TABLE 1-2
Columbia Mills
Analytes/Maximum Concentrations Detected

B. INTERMITTENT STREAM BETWEEN DRUM DISPOSAL AREA AND PLANT AREA

CHEMICAL	MAXIMUM CONCENTRATION DETECTED	
	SURFACE WATER (µg/l)	SEDIMENT (mg/kg)
VOLATILE ORGANICS		
Chloroform	2	
Toluene		0.004
1,1,1–Trichloroethane	1	
SEMIVOLATILES		
Bis(2-ethylhexyl)phthalate		0.740
Chrysene		0.320
Fluoranthene		0.500
Phenanthrene		0.430
Phenol		0.830
Pyrene		0.460
TENTATIVELY IDENTIFIED COMPOUNDS		
4-Chloro-3-Methylphenol		0.490
INORGANICS		
Aluminum		12,400
Antimony		31.4
Arsenic		22.0
Barium		87.9
Cadmium		88.8
Calcium		3,730
Chromium		151
Copper		156
Cyanide		26.0
Iron		45,500
Lead		606
Magnesium		2,650
Manganese		6,030
Nickel		52
Selenium		2.1
Zinc	350	7,230
PESTICIDES		
4,4'-DDD		0.0064
4,4'-DDE		0.013

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Section B Notes:

This data has been updated through 8/17/93.

TABLE 1-2
Columbia Mills
Analytes/Maximum Concentrations Detected

Section E Notes:
All Water sample concentrations in units of µg/l.
All Tunnel sample concentrations in units of ppm.
All Sediment volatile, semivolatile, and pesticide concentrations measured in µg/kg.
All Sediment inorganic concentrations measured in mg/kg.
U – indicates compound was analyzed but not detected.
J – indicates an estimated value.
B – indicates analyte was found in associated blank as well as sample.
R – indicates an unreliable result based on data validation–compound may or may not be present.
L – indicates quantitation limit an estimated quantity.
D – indicates diluted value

TABLE 1-3

THRESHOLD LIMITS FOR SITE INHALATION HAZARDS

PARAMETER	ACGIH TLV TWA ppm	ACGIH TLV STEL ppm	OSHA PEL TWA ppm	OSHA PEL STEL ppm	OSHA PEL CEILING ppm
Benzene	10	–	1	–	5
Beryllium	0.002 mg/m^3	–	0.002	0.005	0.025
Chloroform	10	–	2	–	–
Cyclopentadiene	75	–	75	–	–
Dibutyl phthalate	5 mg/m^3	–	5 mg/m^3	–	–
1,1–Dichloroethene	5	20	1	–	–
Ethylbenzene	100	125	100	125	–
Mercury (skin)	0.01 mg/m^3	0.03 mg/m^3	1.0 mg/m^3	–	0.1 mg/m^3
Methyl ethyl ketone	200	300	200	300	–
Methyl chloride	50	100	50	100	–
Methylene chloride *	50	–	500	–	1000
Napthalene	10	15	10	15	–
Phenol (skin)	5	–	5	–	–
Toluene	100	150	100	150	–
1,1,1–Trichloroethane	350	450	350	450	–
Trichloroethene	50	200	50	200	–
Xylenes	100	150	100	150	–
PCBs (42% Cl) skin	1.0 mg/m^3	–	1.0 mg/m^3	–	–
PCBs (54% Cl) skin	0.5 mg/m^3	–	0.5 mg/m^3	–	–

* Transitional limits – final limits not established.

ACGIH = American Conference of Governmental Industrial Hygienists, a professional association establishing non-enforceable guidance levels for use in occupational environments.

OSHA = Occupational Safety and Health Administration.

TLV = Threshold Limit Value – guidance values.

PEL = Permissable Exposure Limits – regulatory standard.

TWA = Time weighted average for a normal 8 hour day and 40 hour week, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect.

STEL = A 15 minute time weighted average exposure which should not be exceeded at any tume during a work day, even if the eight-hour TWA is met. Short term exposures should exceed three times the TLV–TWA for no more than a total of 30 minutes during a work day and under no circumstances should they exceed five times the TLV–TWA, provided that the TLV–STEL is not exceeded.

Ceiling = An instantaneous exposure not to be exceeded at any time during any part of the work day.

References: ACGIH Threshold Limit Values for Chemical Substances in the Work Environment, 1992-93.
Federal Register, 54 FR 2329-2984, January 19, 1989.

Dermal and Oral Contact: The dermal and oral hazard ratings for the contaminants found in the drum disposal area, the intermittent stream, and the other areas addressed under this remedial action show a high oral toxicity for 11 contaminants and potential skin and/or eye irritation for 14 contaminants. These compounds and their associated hazards are listed in Table 1-4. Dermal contact with contaminants can be controlled by use of the proper PPE and good housekeeping procedures.

1.5 MEDICAL SURVEILLANCE

Medical monitoring, including initial employment, annual and employment termination examinations, will be provided to employees whose work may result in potential chemical exposure or present unusual physical demands. Medical evaluations will be performed by an occupational physician. The medical evaluations will be conducted according to the Corporate Medical Monitoring Program and include an evaluation of the workers' ability to use respirator protective equipment (as per 29 CFR 1910). The examination will include:

- Occupational history.
- Medical history.
- Medical review.
- Medical surveillance examination with emphasis on organ systems potentially affected by toxic substances identified in the work environment.
- Medical certification of physical requirements (sight, hearing, musculoskeletal, cardiovascular) for safe job performance.
- Laboratory testing to include a complete blood count, white cell differential count, serum multiphasic screening and urinalysis.

The purposes of the medical evaluation are to: (1) determine fitness for duty on hazardous waste sites (such an evaluation is based upon the employee's occupational and

TABLE 1-4

DERMAL AND ORAL HAZARDS

DERMAL AND/OR EYE IRRITANT	ORAL THR-HIGH
Anthracene	Chloroform
Benzene	1,1-Dichloroethene
Chloroform	4-4'-DDT
Ethylbenzene	Phenol
Methyl ethyl ketone	Copper
Napthalene	Lead
Nonanoic acid	Magnesium
Phenol	Mercury
Pyrene	Nickel
Toluene	Silver
Trichloroethene	TCDD
Arsenic	
Zinc	
Xylenes	

Note: THR – Toxic Hazard Review
HIGH ORAL THR – LD_{50}: Dose per kilogram of body weight = 50 – 500 mg (Probable lethal dose for a 70 kg man – one ounce or 28.350 g).

Reference: Based on "Dangerous Properties of Industrial Material," 6th Edition, N. Irving Sax Editor, Van Nostrand Reinhold Company, New York, 1984.

medical history, a comprehensive physical examination and an evaluation of the ability to work while wearing protective equipment); and (2) establish baseline medical data.

Supplemental examinations may be performed whenever there is an actual or suspected excessive exposure to chemical contaminants or upon experience of exposure symptoms, or following injuries or temperature stresses.

In conformance with OSHA regulations, medical records will be maintained and preserved for a period of 30 years following termination of employment. Employees have access to the results of medical testing and to full medical records and analyses.

1.6 EMPLOYEE TRAINING PROGRAM

All employees who may be exposed to hazardous substances, health hazards, or safety hazards shall be adequately trained prior to engaging in any on-site work activities. At a minimum, such training shall include an initial 40-hour Hazardous Waste Site Worker Protection Course, an 8-hour Annual Refresher Course subsequent to the initial 40-hour training, and 3 days of actual field experience under the direct supervision of a trained, experienced supervisor (i.e., the Health and Safety Coordinator or his/her designee). This training shall be conducted by a qualified instructor and shall be specifically designed to meet the requirements of OSHA Standard 29 CFR 1910.120(e)(2). At a minimum, the initial 40-hour training course will include the following:

TOPICS

- OSHA/SARA/EPA/RCRA/HCS Requirements
- Decontamination of Personnel & Equipment
- Fire, Explosion & Accident Prevention
- Respiratory Protection Selection & Use
- Preparation of Health & Safety Plans
- Emergency Preparedness & Escape
- Protective Clothing Use & Selection
- Air Monitoring & Surveillance
- Waste Site Safety
- Hazard Recognition
- Medical Surveillance
- Cold & Heat Stress
- Site Entry & Set-Up
- Permissible Exposure Limits
- Site Control & Work Zones
- Chemical & Physical Hazards

- Work Practices to Minimize Risk
- Confined Space Entry

WORKSHOPS/EXERCISES

- Self-Contained Breathing Apparatus
- Air Monitoring Equipment Workshop
- Air Purifying Respirator Workshop
- Decontamination
- Qualitative/Quantitative Fit Test
- Level A/B Field Exercise
- Level B/C Field Exercise
- Air Tank Refilling Workshop

Records and certifications received from the course instructor documenting each employee's successful completion of the training identified above will be maintained on file in both local and corporate headquarters offices. Subcontractor(s) will be required to provide similar documentation of training for all their personnel who will be involved in on-site work activities.

Any employee who has not received adequate training and has been so certified shall be prohibited from engaging in on-site work activities that may involve exposure to hazardous substances, health hazards or safety hazards.

Periodic health and safety briefings will be conducted by the Site Health and Safety Officer for his/her employees on an as-needed basis. Problems relative to respiratory protection, inclement weather, heat/cold stress or the interpretation of newly-available environmental monitoring data are examples of topics which might be covered during these briefings.

1.7 SAFE WORK PRACTICES

All employees shall obey the following safety rules during on-site work activities conducted within the exclusion and support zones:

- Eating, drinking, chewing gum or tobacco, smoking, or any practice which increases the probability of hand-to-mouth transfer of contaminated material is strictly prohibited.

- The hands and face must be thoroughly washed upon leaving the work area and prior to engaging in any activity indicated above.

- Any required respiratory protective equipment and clothing **must** be worn by all personnel going on-site. Excessive facial hair (i.e., beards, long mustaches or sideburns), which interferes with the satisfactory respirator-to-face seal is prohibited.

- Contact with surfaces/materials either suspected or known to be contaminated will be avoided to minimize the potential for transfer to personnel, cross-contamination and need for decontamination.

- Medicine and alcohol can potentiate the effects of exposure to toxic chemicals. Due to possible contraindications, use of prescribed drugs should be reviewed with the Pirnie occupational physician. Alcoholic beverage and illegal drug intake are strictly forbidden during site work activities.

- All personnel shall be familiar with standard operating safety procedures and additional instructions contained in this Health and Safety Plan.

- On-site personnel shall use the "buddy" system. No one may work alone, i.e., out of earshot or visual contact with other workers in the exclusion zone.

- Personnel and equipment in the contaminated area shall be minimized, consistent with effective site operations.

- All employees have the obligation to correct or report unsafe work conditions.

- Use of contact lenses on-site will not be permitted. Spectacle kits for insertion into full-face respirators will be provided for employees as required.

1.8 PERSONAL PROTECTION EQUIPMENT

Personnel must wear personal protective equipment (PPE) when work activities involve known or suspected atmospheric contamination; when vapors, gases, or particulates may be generated; or when direct contact with dermally active substances may occur. Full-face respirators will be used to protect the lungs, the gastro-intestinal tract and the eyes against air toxicants. Chemical-resistant clothing will be used to protect the skin from contact with skin-destructive and skin-absorbable chemicals. All PPE shall be maintained and stored as specified by the manufacturer. Good personal hygiene and safe work practices,

as identified in Section 1.7, are also necessary to limit or prevent the ingestion of potentially harmful substances.

Personal protection equipment has been designated for each project task where potential hazards exist. The designated PPE for each task is listed in Table 1-5. The Site Health and Safety Coordinator will monitor the use of PPE during extreme temperature conditions.

1.9 ENVIRONMENTAL MONITORING

1.9.1 General On-Site Monitoring

Modifications to the level of protection established for employees for each task will be based upon measurements of the contaminants present in the work environment. Tasks and activities proposed for this site along with the estimated potential of exposure to contaminants known to be present in the groundwater and soil at each well location will be used to determine the minimum required levels of personal protection and is described in Section 5.8. Based upon the existing data base, the release of organic vapors may occur during the construction phase of the project. Ambient breathing zone concentrations may, at times, exceed the permissible exposure limits (PEL) established by OSHA for the individual compounds (see Table 1-3). Respiratory and dermal protection may be modified (upgraded or downgraded) based upon real-time field monitoring data.

Contaminated soil and groundwater are most likely to be encountered during liner repair and monitoring activities. The air monitoring program will monitor volatile contaminants as well as the presence of respirable dust when soil is physically disturbed. Real time monitoring, with a combustible gas meter and total organic vapor analyzer (HNu), will be performed by the Health and Safety Coordinator on a periodic basis during all sampling and field reconnaissance surveys. The level of respiratory and dermal protection in use will be based upon an evaluation of general air monitoring data.

Monitoring instruments will be protected from surface contamination during use to allow for easy decontamination. When not in use, the monitoring instruments will be placed

MALCOLM PIRNIE

TABLE 1-5

PPE FOR EACH PROJECT TASK WITH AN IDENTIFIED HAZARD

1.	Conduct landfill gas monitoring (Level D): ▪ Work clothes or coveralls ▪ Rubber boots (pull-on) and safety shoes ▪ Safety glasses
2.	Sample groundwater, surface water, and sediment (Level D respiratory, Level C dermal): ▪ Tyvek Suit ▪ Chemical protective gloves (latex) ▪ Rubber boots (pull-on) and safety shoes ▪ Safety glasses
3.	Conduct site inspection and non-intrusive maintenance (Level D): ▪ Coveralls (or work clothes) ▪ Rubber boots (pull-on) and safety shoes ▪ Safety glasses
4.	Intrusive maintenance (Level D respiratory, Level C dermal): ▪ Tyvek Suit ▪ Chemical protective gloves (latex) ▪ Rubber boots (pull-on) and safety shoes ▪ Safety glasses
5.	Groundwater level monitoring (Level D respiratory, Level C dermal): ▪ Tyvek Suit ▪ Chemical protective gloves (latex) ▪ Rubber boots (pull-on) and safety shoes ▪ Safety glasses

on plastic sheeting to avoid surface contact. Additional monitoring instruments may be required if the situations or conditions change.

Any grab samples which are collected as part of an addended scope of work will be surveyed with the HNu, or similar equipment as each sample is retrieved. These values will be recorded with the respective sample number and will assist in the determination of the adequacy of employee protective equipment.

1.9.2 On-Site Monitoring Action Levels

The HNu or other appropriate instrument(s) will be used to monitor organic vapor concentrations as specified in this plan. Methane gas will be monitored during cover system repairs or other activities requiring significant cap disruption with the "combustible gas" option on an explosimeter/tritector or other appropriate instrument(s). In addition, fugitive dust/particulate concentrations will be monitored during cover system repairs or substantially intrusive activities using a real-time particulate monitor. Readings obtained in the breathing zone may be interpreted (with regard to other site conditions) as follows for on-site personnel:

- Total atmospheric concentrations of unidentified vapors or gases ranging from 0 to background on the HNu - Continue Operations Under Level D.
- Total atmospheric concentrations of unidentified vapors or gases yielding sustained readings above background to 5 ppm on the HNu (vapors not suspected of containing high levels of chemicals toxic to the skin) - Continue Operations Under Level C.
- Total atmospheric concentrations of unidentified vapors or gases yielding sustained readings of 5 to 50 ppm above background on the HNu - continue operations under Level B, re-evaluate and alter activies (if possible) to achieve lower vapor concentrations.
- Total atmospheric concentrations of unidentified vapors or gases above 50 ppm on the HNu - discontinue engineering operations and exit the work zone immediately.

The explosimeter will be used to monitor levels of both combustible gases and oxygen during site activities. Action levels based on the instrument readings shall be as follows:

- Less than 10% LEL - Continue engineering operations with caution.
- 10-25% LEL - Continuous monitoring with extreme caution, determine source/cause of elevated reading.
- Greater than 25% LEL - Explosion hazard, evaluate source and leave the Work Zone.
- Less than 19.5% oxygen - leave Work Zone immediately.
- 19.5-25% oxygen - Continue engineering operations with caution.
- Greater than 25% oxygen - Fire hazard potential, leave Work Zone immediately.

The particulate monitor will be used to monitor respirable dust concentrations during all intrusive activities for the purpose of settling these actions, the air contaminant is considered to be 100 percent lead (Pb). Action levels based on the instrument readings shall be as follows:

- Less than 150 ug/m^3 - Continue field operations.
- Greater than 150 ug/m^3- Don dust/particulate mask or equivalent. Initiate engineering controls (viz. wetting of excavated soils or tools at discretion of Site Health and Safety Officer).

Readings with the explosimeter, particulate monitor, and organic vapor analyzer will be recorded and documented in the Health and Safety logbook. All instruments will be calibrated before use and the procedure will be documented in the Health and Safety logbook.

1.9.3 Community Monitoring Action Levels

All precautions will be taken to protect the health of the surrounding community. In the unlikely event that an emergency situation arises, the Oswego County Health Department and the New York State Department of Health will be notified.

- Evan Walsh (315) 349-3564
  Oswego County Health Department
  70 Bunner Street
  Oswego, New York 13126

- Ronald Heerkens - (315) 426-7613
  New York State Department of Health
  677 South Salina Street
  Syracuse, New York 13202

The NYSDEC/NYSDOH Community Air Monitoring Plan is provided below:

COMMUNITY AIR MONITORING PLAN

Real time air monitoring for volatile compounds and particulate levels at the perimeter of the work area is necessary. The plan must include the following:

- Volatile organic compounds must be monitoried at the downwind perimeter of the work area daily at 2 hour intervals. If total organic vapor levels exceed 5 ppm above background, work activities must be halted and monitoring continued under the provisions of a Vapor Emission Response Plan. All readings must be recorded and be available for State (DEC and DOH) personnel to review.

- Particulates should be continuously monitored upwind, downwind and within the work area at temporary particulate monitoring stations. If the downwind particulate level is 150 $\mu g/m^3$ greater than the upwind particulate level, then dust suppression techniques must be employed. All readings must be recorded and be available for State (DEC & DOH) personnel to review.

Vapor Emission Response Plan:

If the ambient air concentration of organic vapors exceeds 5 ppm above background at the perimeter of the work area, activities will be halted and monitoring continued. If the organic vapor level decreases below 5 ppm above background, work activities can be resume but more frequent intervals of monitoring, as directed by the Safety Officer, must be conducted. If the organic vapor levels are greater than 5 ppm over background but less than 25 ppm over background at the perimeter of the work area, activities can resume provided:

- The organic vapor level 200 feet downwind of the work area or half the distance to the nearest residential or commercial structure, whichever is less, is below 5 ppm over background.

- More frequent intervals of monitoring, as directed by the Safety Officer, are conducted.

If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown. When work shutdown occurs, downwind air monitoring as directed by the Safety Officer will be implemented to ensure that vapor emission does not impact the nearest residential or commercial structure at levels exceeding those specified in the Major Vapor Emission section.

Major Vapor Emission:

If any organic levels greater than 5 ppm over background are identified 200 feet downwind from the work area or half the distance to the nearest residential or commercial property, whichever is less, all work activities must be halted.

If following the cessation of the work activities, or as the result of an emergency organic levels persist above 5 ppm above background 200 feet downwind or half the distance to the nearest residential or commercial property from the work area, then the air quality must be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (20 Foot Zone).

If efforts to abate the emission source are unsuccessful and if any of the following levels persist for more than 30 minutes in the 20 Foot Zone, then the Major Vapor Emission Response Plan shall automatically be placed into effect if organic vapor levels are approaching 5 ppm above background.

However, the Major Vapor Emission Response Plan shall be immediately placed into effect if organic vapor levels are greater than 10 ppm above background.

Major Vapor Emission Response Plan:

Upon activation, the following activities will be undertaken:

1. All Emergency Response Contacts as listed in the Health and Safety Plan of the Work Plan will go into effect.

2. The local police authorities will immediately be contacted by the Safety Officer and advised of the situation.

3. Frequent air monitoring will be conducted at 30 minute intervals within the 20 Foot Zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the Safety Officer.

1.10 HEAT/COLD STRESS MONITORING

Since site inspections, maintenance, and monitoring activities will be scheduled for both the summer and winter months, measures will be taken to minimize heat/cold stress to employees. The Site Health and Safety Coordinator or his/her designee will be responsible for monitoring employees for symptoms of heat/cold stress.

1.10.1 Heat Stress Monitoring

Personal protective equipment may place an employee at risk of developing heat stress, probably one of the most common (and potentially serious) illnesses encountered at sites requiring PPE. The potential for heat stress is dependent on a number of factors, including environmental conditions, clothing, workload, physical conditioning and age. Personal protective equipment may severely reduce the body's normal ability to maintain equilibrium (via evaporation, convection and radiation), and by its bulk and weight increases energy expenditure.

The signs and symptoms of heat stress are as follows:

- Heat rash may result from continuous exposure to heat or humid air.
- Heat cramps are caused by heavy sweating with inadequate electrolyte replacement. Signs and symptoms include:
  - muscle spasms
  - pain in the hands, feet and abdomen

- Heat exhaustion occurs from increased stress on various body organs including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms include:

  - pale, cool, moist skin
  - heavy sweating
  - dizziness
  - nausea
  - fainting

- Heat stroke is the most serious form of heat stress. Temperature regulation fails and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury and death occur. Competent medical help must be obtained. Signs and symptoms are:

  - red, hot, usually dry skin
  - lack of or reduced perspiration
  - nausea
  - dizziness and confusion
  - strong, rapid pulse
  - coma

The monitoring of personnel wearing protective clothing should commence when the ambient temperature is 70 degrees Fahrenheit or above. For monitoring the body's recuperative ability to excess heat, one or more of the following techniques should be used as a screening mechanism.

- Heart rate may be measured by the radial pulse for 30 seconds as early as possible in the resting period. The rate at the beginning of the rest period should not exceed 110 beats per minute. If the rate is higher, the next work period should be shortened by 10 minutes (or 33%), while the length of the rest period stays the same. If the pulse rate is 100 beats per minute at the beginning of the next rest period, the following work cycle should be further shortened by 33%.

- Body temperature may be measured orally with a clinical thermometer as early as possible in the resting period. Oral temperature at the beginning of the rest period should not exceed 99.6 degrees Fahrenheit. If it does, the next work period should be shortened by 10 minutes (or 33%), while the length of the rest period stays the same. However, if the oral temperature exceeds 99.6 degrees Fahrenheit at the beginning of the next period, the following work cycle may be further shortened by 33%. Oral temperature should be

measured again at the end of the rest period to make sure that it has dropped below 99.6 degrees Fahrenheit. No Malcolm Pirnie employee will be permitted to continue wearing semipermeable or impermeable garments when his/her oral temperature exceeds 100.6° Fahrenheit.

1.10.2 Cold Stress Monitoring

Exposure to cold conditions may result in frostbite or hypothermia, each of which progresses in stages as shown below.

- **Frostbite** occurs when body tissue (usually on the extremities) begins to freeze. The three states of frostbite are:

  1) **Frostnip** - This is the first stage of the freezing process. It is characterized by a whitened area of skin, along with a slight burning or painful sensation. Treatment consists of removing the victim from the cold conditions, removal of boots and gloves, soaking the injured part in warm water (102-108°F) and drinking a warm beverage.

  2) **Superficial Frostbite** - This is the second stage of the freezing process. It is characterized by a whitish-grey area of tissue which will be firm to the touch but will yield little pain. Treatment is identical to that for frostnip.

  3) **Deep Frostbite** - In this final stage of the freezing process the affected tissue will be cold, numb and hard, and will yield little to no pain. Treatment is identical to that for frostnip.

- **Hypothermia** occurs when the body loses heat faster than it can produce it. The stages of hypothermia (which may not be clearly defined or visible at first) are the following:

  1) Shivering
  2) Apathy (a change to a disagreeable mood)
  3) Unconsciousness
  4) Bodily freezing
  5) Death (if untreated)

  Treatment of hypothermia is given below:

  - Remove the victim from the cold environment and remove wet or frozen clothing. (Do this carefully as frostbite may have started.)

- Perform active re-warming with hot liquids for drinking (Note: do **not** give the victim any liquid containing alcohol or caffeine in this case) and a warm water bath (102-108°F)

- Perform passive re-warming with a blanket or jacket wrapped around the victim.

In any potential cold stress situation, it is the responsibility of the Site Health and Safety Officer to encourage the following:

- Workers should dress warmly, with more layers of thin clothing as opposed to one thick layer.

- Personnel should remain active and keep moving.

- Personnel should be allowed to take shelter in a heated area, as necessary.

- Personnel should drink warm liquids (no caffeine or alcohol if frostbite has set in).

1.11 WORK ZONES AND SITE CONTROL

Work zones around the areas designated for site inspection and maintenance, sample collection, and landfill gas monitoring will be established by the Health and Safety Coordinator on a daily basis and communicated to all employees and other site users. It shall be the Site Health and Safety Coordinator's responsibility to ensure that all site workers are aware of the work zone boundaries and to enforce proper procedures in each area. The zones will include:

- **Exclusion Zone ("Hot Zone")** - the area where contaminated materials may be exposed, excavated or handled and all areas where contaminated equipment or personnel may travel. The zone will be delineated by flagging tape. All personnel entering the Exclusion Zone must wear the appropriate PPE.

- **Contamination Reduction Zone** - the zone where decontamination of personnel and equipment takes place. Any potentially contaminated clothing, equipment and samples must remain in the Contamination Reduction Zone until decontaminated.

- **Support Zone** - the part of the site which is considered non-contaminated or "clean". Support equipment will be located in this zone, and personnel may wear normal work clothes within this zone.

Access of non-essential personnel to the Exclusion and Contamination Reduction Zones will be strictly controlled by the Health and Safety Coordinator. Only personnel who are essential to the completion of the task will be allowed access to these areas and only if they are wearing appropriate PPE. Entrance of all personnel must be approved by the Site Health and Safety Coordinator.

A log containing the names of workers and their level of protection will be maintained on-site.

The zone boundaries may be changed by the Site Health and Safety Coordinator as environmental conditions warrant, and to respond to the necessary changes in work locations on-site.

1.12 FIRE PREVENTION AND PROTECTION

Recommended practices and standards of the National Fire Protection Association (NFPA) and other applicable regulations will be followed in the development and application of Project Fire Protection Programs. When required by regulatory (DEC) authorities, the project management will prepare and submit a Fire Protection Plan for the approval of the contracting officers, authorized representative or other designated official. Essential considerations for the Fire Protection Plan will include:

- Proper site preparation and safe storage of combustible and flammable materials.
- Availability of coordination with private and public fire authorities.
- Adequate job-site fire protection and inspections for fire prevention.
- Adequate indoctrination and training of employees.

1.12.1 Equipment and Requirements

- Fire extinguishers will be provided by the Subcontractor(s).
- Fire extinguishers will be inspected, serviced, and maintained in accordance with the manufacturer's instructions. As a minimum, all extinguishers shall be checked monthly and weighed semi-annually, and recharged if necessary.
- Immediately after each use, fire extinguishers will be either recharged or replaced.

1.12.2 Flammable and Combustible Substances

- All storage, handling or use of flammable and combustible substances will be under the supervision of qualified persons.
- All tanks, containers and pumping equipment, whether portable or stationary, which are used for the storage and handling of flammable and combustible liquids, will meet the recommendations of the NFPA.
- If the LEL exceeds 10% for any compound, fans will be used to dissipate volatile/combustible gases and to minimize the explosion hazard during drilling/excavation activities. In addition, % O_2/explosive gas monitoring will be conducted throughout the drilling/excavation operations.

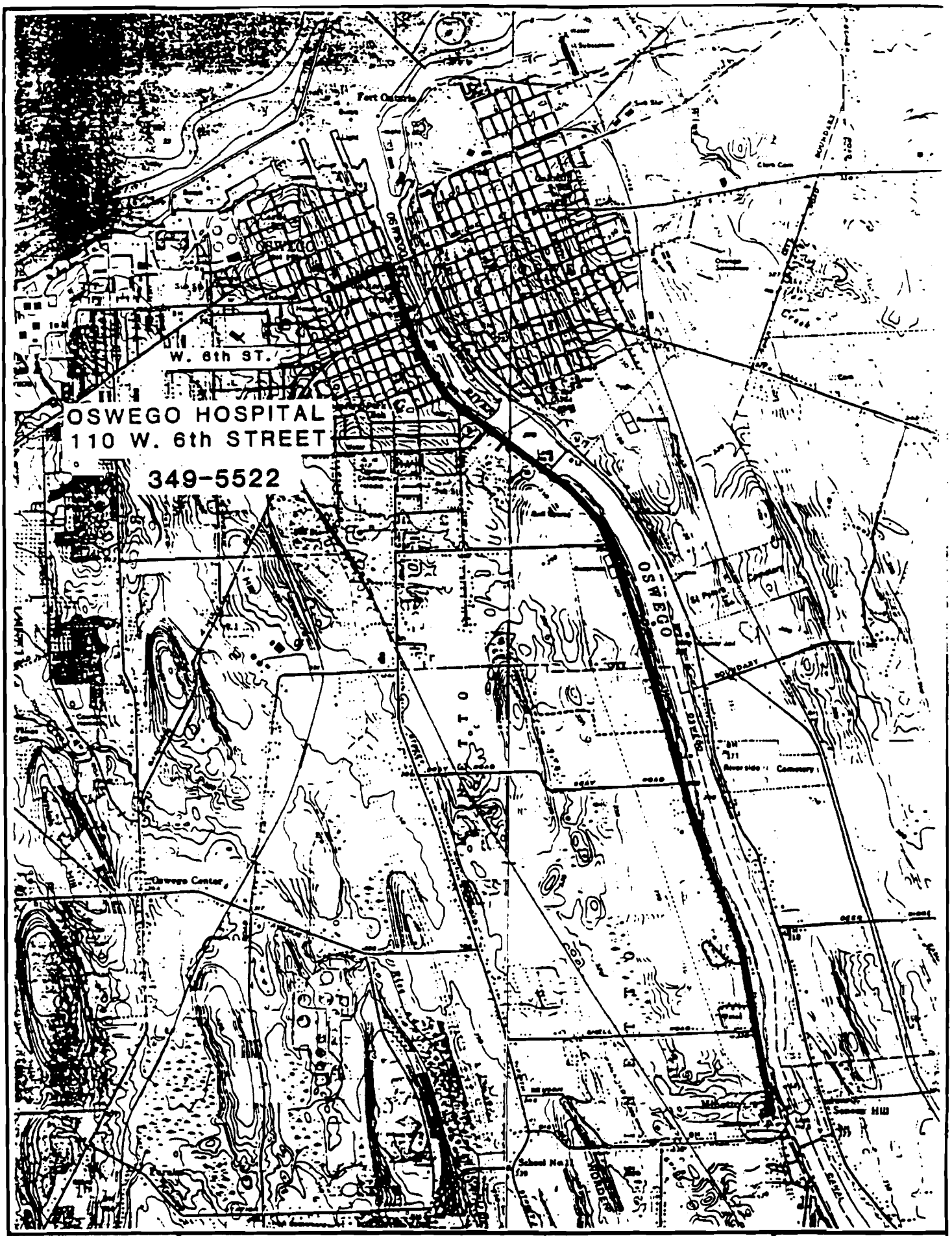
1.13 EMERGENCY RESPONSE PLAN

Emergency medical treatment can be obtained at the Oswego Hospital in Oswego. Additionally, the Minetto Fire Department is located just beyond the site boundary.

Menter's Ambulance	(315) 592-4145 (315) 592-5365
Hospital Phone Number	(315) 349-5522
Directions to Hospital	(See Figure 3.) Exit Columbia Mills and turn left (north) on Route 48. Proceed north towards Oswego. In Oswego, turn left onto Route 104 (W. Bridge Street). Turn left again on W. 6th Street.

Other Emergency Numbers

- Minetto Fire Department: (315) 343-5550



MALCOLM PIRNIE

FIGURE 3

ROUTE TO HOSPITAL

MALCOLM PIRNIE, INC.

DECEMBER 1992

1303311

- Oswego County Sheriff: (315) 343-5490
- Nearest Phone: To Be Determined at Time of Work.

Non-Emergency

- Minetto Volunteer Fire Department: (315) 343-7566

This information shall be posted in the on-site treatment trailer and in the field vehicle. It is the Site Safety Officer's responsibility to ensure that the information sheet is posted.

1.14 HAZARD COMMUNICATION STANDARD

In order to comply with the OSHA Hazard Communication Standard (29 CFR 1910.1200), the Contractor and other site representatives must implement a Hazard Communication Program (HCP). The program must be designed to provide employees with information on hazardous chemicals to which they may be exposed. Information is provided to employees through employee training, container labeling of all chemicals used, Material Safety Data Sheets (MSDS), and access to the written HCP. The only chemicals which should be introduced to the site are those used for sample preservation and decontamination (e.g., nitric acid, sulfuric acid and Alconox™). The MSDS's for these chemicals must be maintained at the site and provided for review by all field personnel.

Columbia Mill

Minetto, NY

OSWEGO COUNTY

Mastulock 2310
piezometers
~~2310 MW~~
3208 gate

ANNUAL

5

Sept. 16 & 17, 1997

Sept 15 & 16, 1998

Sept. 21 & 22, 1999

2000

Printed on Recycled Paper

NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DIVISION OF ENVIRONMENTAL REMEDIATION

CHAIN OF CUSTODY RECORD

Please Print legibly in ink:

Site Name: Columbia Mills

Site Code: 738012 Region: 7

T A Code: B332

Proj Manager: Northfield Strang

Bureau / Region: BHSC/O

Phone Number: 402-9640

VOA (40 ML)	BNA; PEST; PCBs (1 LITER)	METALS (preserved 500 ML/ 1 LITER)	SOIL JARS	
Sets	**BNAs P/PCBs**	**Metals**	**VOAs**	**P/PCBs**
Plus Trip Blank			**BNAs**	**Metals**

Bottles Released by: (Signature, Date/Time)

Received by: (Signature, Date/Time)

JC Strang 8/13/01 2:30 pm

Sampler completes items 1 thru 8, one sample per line. Check analyses requested.

(1)FIELD ID	(2)MATRIX *	(3)DATE COLLECTED	(4)VOA	(5)BNA	(6)PEST PCB	(7)METALS	(8)COMMENTS (or SPECIAL ANALYSIS)	LAB SAMPLE ID Lab use only
B332EFF01	GW	08/14/01	✓			✓	effluent Metals 11:15	
B332Eff-Dup	GW	08/14/01	✓				VOAs 11:18	
							cannot measure flow.	
							final 7.0 max 7.12	
							pH 8.90	
							Temp. 16.6	
							Conduct 41	

* Please categorize the sample matrix as one of the following:

GW - Groundwater LEACH - Leachate

SW - Surface water WASTE - Specify

SOIL - Soil OTHER - Specify

SED - Sediment TB - Trip Blank

Shipping Address:

DER LAB, Room D201

1 University Place

Rensselaer, NY 12144

ATT: Brian Policastro

Phone: 518-525-2766

COLLECTED BY: (Signature,date/time) JC Strang 8/14/01 11:33

RELINQUISHED BY: (Signature,date/time)

LABORATORY ACCESSION BY: (Signature,date/time) 8/15/01 1400

If you have any questions please call Fred Woodward at 518-457-9280 (office) or 518-525-2766 (lab).

A	A	B	C	D	E	F
1	Columbia Mills	7-38-012	Minetto	Oswego County		
2						
3	**Outfall 001**					
4	**Landfill Leachate**	Discharge	1997	1997	1997	1997
5		Limits	June 30	July 24	Sept 17	Dec 17
6		mg/l	mg/l	mg/l	mg/l	mg/l
7	Flow	monitor			0.9 gpm	
8	pH (range)	**6.5 to 8.5**			**6.48**	
9	TSS	**10**	<1.0	<1.0	clear	<1
10	Barium, total	**0.3**	0.125	0.147	0.24	0.129
11	Iron, total	**0.3**	0.017	0.014	<0.11	0.023
12	Manganese, total	**4**	0.343	0.282	0.56	0.903
13	Cyanide, total	**0.06**	<0.02	<0.02		<0.02
14	Zinc, total	**0.4**	0.017	0.02	0.033	0.012
15						
16		Discharge	1998	1998	1998	
17		Limits	March 25	June	Sept 16	
18		mg/l	mg/l	mg/l	mg/l	
19	Flow	monitor	10.6 gpm	2.6 gpm	2.5 gpm	
20	pH (range)	**6.5 to 8.5**	6.87	6.7	6.7	
21	TSS	**10**	<1	2.22		
22	Barium, total	**0.3**	0.092	0.143	0.170 B	
23	Iron, total	**0.3**	0.031	0.25	<0.05	
24	Manganese, total	**4**	1.16	0.464	0.14	
25	Cyanide, total	**0.06**	<0.02	<0.01	<0.01	
26	Zinc, total	**0.4**	<0.01	0.029	0.011	
27						
28		Discharge	1999	1999	1999	1999
29		Limits	Jan 29	Mar 15	Aug 03	Sept 21
30		mg/l	mg/l	mg/l	mg/l	mg/l
31	Flow	monitor	7.9 gpm	6.7 gpm		1.3 gpm
32	pH (range)	**6.5 to 8.5**	6.66	6.98	7.04	6.6
33	TSS	**10**	<1	<2.2	<1	<1
34	Barium, total	**0.3**	0.133	0.113	0.152	0.18
35	Iron, total	**0.3**	<0.100	<0.100	<0.01	0.141
36	Manganese, total	**4**	0.328	1.49	0.052	0.081
37	Cyanide, total	**0.06**	<0.01	<0.01	<0.02	<0.01
38	Zinc, total	**0.4**	0.014	0.014	0.011	0.033
39						
40						
41	738012.wb2					

see Cyn Whitfield

2000 | 2001
Aug. 14
not measurable
8.90
clear

2/2/00
jrcs

Cyn
jrcs
Tony Sylvester
Reg. 7
Reg. Parker
John Piston

Columbia Mills 738012

Annual Monitoring

September 21 & 22, 1999 (all results ug/l or ppb)

Sample ID	MW	Volatiles	Cyanide	Metals Ba	Fe	Mg	Mn	Zn
B332-01	1S	ND 10U	4.0U	475	2370	11400	106	25.1
-02	1D	ND 10U	4.0U	1180	540	9160	99.6	23.5
-03	4S	ND 10U	4.0U	302	623	9270	339	20.8
-04	4D	ND 10U	4.0U	362	400	12500	222	21.2
-05	2S	ND 10U	4.0U	280	2820	13400	122	25.5
-06	2D	ND 10U	4.0U	253	586	14200	180	22.4
-07	3S	ND 10U	NR	383	24700	18000	522	81.3
-08	3D	Methylene Chloride 3.3J all others 10U	NR	406	38300	14800	759	114
-09	Leachate	ND 10U	4.0U	180B	141	13900	80.8	33.3
-10	Leachate	ND 10U	4.0U	186B	106	14400	14.6B	36.6
-11	Pond Sediment	Methylene Chloride 10J Acetone 17J all others 20U	0.41U	143	15500	3460	1160	116
GW LIMITS			200	1000	300	35000	300	2000
Leachate Permit limits			60	300	300	—	4000	400

JMStrang 2/2/00

September 15+16, 1998

Sample ID	Mon. Well	VOA's	Cyanide	Metals	Semi-Voa's
B332-01	1S	ND 10U	0.01U	Ba 630 Mn 110 Fe 610 Zn 10U	OK
-02	1D	ND 10U	0.01U	Ba 1500 Mn 120 Fe 470 Zn 10U	OK
-03	2S	ND 10U	0.01U	Ba 500 Mn 1400 Fe 6400 Zn 20	OK 3 TICS
-04	2D	ND 10U	0.01U	Ba 300 Mn 250 Fe 440 Zn 10U	OK
-05	3S	ND 10U	0.01U	Ba 520 Mn 740 Fe 28000 Zn 70	— not enough wat
-06	3D	Benzene 1 J all others ND 10U	0.01U	— not enough H_2O	— not enough water
-07	4S	ND 10U	0.01U	Ba 300 Mn 360 Fe 1300 Zn 10U	OK
-08	4D	ND 10U	0.01U	Ba 310 Mn 180 Fe 360 Zn 10U	OK 2 TICS
-09	Leachate	ND 10U	0.01U	MEETS Permit! Ba 170 B Fe 50U	OK
-10	Pond Sediment	Acetone 16 all others 15U	0.752U	Ba 46 Fe 9100 Zn 42	OK 6 TICS

Permit Levels

Ba	Barium, tot	300
Fe	Iron tot	300
	Manganese tot	4000
Zn	Zinc, tot	400
	Cyanide, tot	60 ppb

7-38-012 COLUMBIA MILLS

9/16+9/17/97 Annual Monitoring

	VOA's	Metals				
		Ba	Fe	Mn	Zn	Na
LF 1S	ND (5U)	590	1100	100	22 U	16000
LF 1D	ND	1200	720	110	22 U	20000
LF 2S	ND	240	740	56	22 U	5600 U
LF 2D	benzene 2J	270	120	180	22 U	5600 U
LF 3S	chloroform 1J	400	25000	610	100	47000
LF 3D	chloroform 2J	440	66000	3300	280	100000
LF 4S	ND	230	380	190	22 U	100000
LF 4D	ND	360	620	160	22 U	89000
Sediment	ND (14U)	160	20000	680	120	390 U
Sediment Dup	1,1,1-trichloroethane 4JB (13U)					
Leachate	ND all OK	240	110 U	560	33	14000
Trip Blank	ND					

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning September 1, 1997 and lasting until August 31, 2002

the discharges from the treatment facility to water index number Ont-66-1, Class C, Evert's Creek shall be limited and monitored by the operator as specified below:

Outfall Number and Parameter	Discharge Limitations		Units	Minimum Monitoring Requirements	
	Daily Avg.	Daily Max		Measurement Frequency	Sample Type
Outfall 001 - Landfill Leachate:					
Flow	Monitor	Monitor	GPD	Quarterly	Totalizer
pH (range)	6.5 to	8.5	SU	Quarterly	Grab
Total Suspended Solids		10	mg/l	Quarterly	Grab
Barium, total		0.3	mg/l	Quarterly	Grab
Iron, total		0.3	mg/l	Quarterly	Grab
Manganese, total		4.0	mg/l	Quarterly	Grab
Cyanide, total		0.06	mg/l	Quarterly	Grab
Zinc, total		0.4	mg/l	Quarterly	Grab

Additional Conditions:

(1) Discharge is not authorized until such time as an engineering submission showing the method of treatment is approved by the Department. The discharge rate may not exceed the effective or design treatment system capacity. All monitoring data, engineering submissions and modification requests must be submitted to:

Chief - Operation Maintenance and Support Section
Bureau of Hazardous Site Control
Division of Environmental Remediation
NYSDEC
50 Wolf Road
Albany, N.Y. 12233-7010

Groundwater Standards and Criteria
For 1993(old) and 1998 (new) for
Inorganics

Contaminants	Groundwater Standards/ Criteria Cw *ug/l or ppb.* Old	Groundwater Standards/ Criteria Cw *ug/l or ppb.* New	Notations
Aluminum	none	none	
Antimony	*3.00*	*3.00*	*1*
Arsenic	25.00	25.00	
Barium	1000.00	1000.00	
Beryllium	3.00	3.00	2
Cadmium	*10.00*	*5.00*	
Calcium	none	none	
Chromium	50.00	50.00	
Cobalt	none	none	
Copper	200.00	200.00	
Cyanide	*100.00*	*200.00*	
Iron	300.00	300.00	
Lead	25.00	25.00	
Magnesium	35000.00	35000.00	2
Manganese	300.00	300.00	
Mercury	*2.00*	*0.70*	
Nickel	*none*	*100.00*	
Potassium	none	none	
Selenium	10.00	10.00	
Silver	50.00	50.00	
Sodium	20000.00	20000.00	
Thallium	*4.00*	*0.50*	*2*
Vanadium	none	none	
Zinc	*300.00*	*2000.00*	*3*

N/A is not available

Notations

1. 1993 was guidance value as per TOGS 1.1.1; 1998 is a standard
2. 1993 and 1998 are both guidance values
3. 1993 was a standard; 1998 is a guidance as per Draft April 1998 TOGS 1.1.1

Columbia Mills, # 7-38-012, Town of Minetto, Oswego County

Outfall 001 - Landfill Leachate Analytical Results (in mg/l)

		1996		1997								
Parameter	**Limits mg/l**	OCT 01	OCT 08	NOV 18	DEC 11	JAN 22	FEB 10	MAR 12	APR 03	MAY 27	JUN 30	JUL 24
Al, Total	**0.1**	<0.05	0.06	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	
Ba, Total	**0.3**	<0.3	<0.3	0.191	0.170	0.136	0.128	0.115	0.109	0.116	0.125	
Cd, Total	**0.014**	<0.005	<0.005	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	
Cr, Total	**0.5**	<0.05	<0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
Cu, Total	**0.1**	<0.02	<0.02	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
Cu, Dissolved	**monitor**	<0.02	<0.02	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
Fe, Total	**0.3**	0.08	0.07	0.08	0.089	0.05	0.039	0.086	0.066	0.68	0.017	
Mn, Total	**4.0**	2.5	2.8	1.95	1.71	0.716	0.725	1.45	1.24	1.01	0.343	
Pb, Total	**0.33**	<0.1	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
Sb, Total	**0.8**	<0.3	<0.3	<0.075	<0.075	<0.075	<0.075	<0.075	<0.075	<0.075	<0.075	
Cyanides Hydrolyzable	**0.06**	<0.1	0.02	0.003	NA	<0.002	<0.002	<0.002	<0.002	<0.02	<0.02	
Zn, Total	**0.4**	0.13	0.10	0.037	0.029	0.017	0.017	0.013	<0.01	0.014	0.017	
Toluene	**0.01**	<0.003	<0.003	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.0003 BJ	
Trichloro-ethene	**0.01**	<0.003	<0.003	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.0002 J	
MEK	**monitor**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.001 BJ	
TSS	**10.0**	<1.0	2.0	2.0	2.0	<1.0	<1.0	<1.0	1.0	<1.0	<1.0	

NA - parameter not analyzed during that sampling event

We are awaiting June 30, 1997 results from the Department of Health Labs.

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning September 1, 1997 and lasting until August 31, 2002

the discharges from the treatment facility to water index number Ont-66-1, Class C, Evert's Creek shall be limited and monitored by the operator as specified below:

Outfall Number and Parameter	Discharge Limitations		Units	Minimum Monitoring Requirements	
	Daily Avg.	Daily Max		Measurement Frequency	Sample Type
Outfall 001 - Landfill Leachate:					
Flow	Monitor	Monitor	GPD	Quarterly	Totalizer
pH (range)	6.5 to	8.5	SU	Quarterly	Grab
Total Suspended Solids		10	mg/l	Quarterly	Grab
Barium, total		0.3	mg/l	Quarterly	Grab
Iron, total		0.3	mg/l	Quarterly	Grab
Manganese, total		4.0	mg/l	Quarterly	Grab
Cyanide, total		0.06	mg/l	Quarterly	Grab
Zinc, total		0.4	mg/l	Quarterly	Grab

Additional Conditions:

(1) Discharge is not authorized until such time as an engineering submission showing the method of treatment is approved by the Department. The discharge rate may not exceed the effective or design treatment system capacity. All monitoring data, engineering submissions and modification requests must be submitted to:

Chief - Operation Maintenance and Support Section
Bureau of Hazardous Site Control
Division of Environmental Remediation
NYSDEC
50 Wolf Road
Albany, N.Y. 12233-7010

[redacted]

ND: Sample Not Done

Blank Cell: Value < Detection limits

	Units	Limits	Detection Limits	09/16/97	12/17/97	04/20/98	06/26/98
Barium	MCG/L	300		240	129	92	143
Iron	MCG/L	300		<110	23	31	250
Manganese	MCG/L	4000		560	903	1160	464
Zinc	MCG/L	400		33	12	<10	28.9
Cyanide*	MG/L	0.06		ND	<0.02	<0.020	<0.010
Suspended Solids	MG/L	10		ND	<1	<1	2.22
pH	SU	6.5 to 8.5		?	ND	7.45	6.7
Conductivity		NA		?	?	NA	370
Flow	gpm	Monitor		?	?	?	2.6
Time		NA				1345	1100
Lab				DEC			CAS
Benzene*			5				
Trichloroethene*			5				
Toluene*			5				
MEK*			5				
Benzo(a)anthracene*				ND			
Benzo(b)floroanthene*				ND			
Benzo(k)floroathene*				ND			
Benzo(d)pyrene*				ND			
Chrysene*				ND			
Chloroform				ND			

Columbia.wb2 on Region 7 disk

S

[redacted] - Groundwater Monitoring

ND: Sample Not Done
Blank Cell: Value < Detection limits

LF-1S	Ug/l 1998 GW Stand.	Detection	09/16/97
Aluminum	NS		770
Antimony	3	33	
Arsenic	25	11	
Barium	1000		590
Beryllium	3	5.6	
Cadmium*	5	5.6	
Calcium	NS		62000
Chromium*	50	11	
Cobalt	NS	56	
Copper*	200	28	
Iron	300		1100
Lead*	25		6.3
Magnesium	35000Guid		14000
Manganese	300		100
Mercury	0.7		0.28
Nickel	100	44	
Potassium	NS	5600	
Selenium	10	5.6	
Silver	50	11	
Sodium	20000		16000
Thallium	4 Guid	11	
Vanadium	NS	56	
Zinc*	300	22	
Iron & Manganese	500		1200
Benzene*	1	5	
Trichloroethene*	5	5	
Toluene*	5	5	
MEK*(2-butanone)	50	5	
Benzo(a)anthracene*	NS		ND
Benzo(b)floroanthene*	.002Guid		ND
Benzo(k)floroathene*	.002Guid		ND
Benzo(d)pyrene*	NS		ND
Chrysene*	.002Guid		ND
Cyanide*	200		ND

* Previous to landfill construction ; these compounds were found in drum disposal area , ash, debris area
ND Not done or Analyzed for

Colonial Mills: Groundwater LF-1D

ND: Sample Not Done
Blank Cell: Value < Detection limits

LF-1D	Ug/l GW Stand.	Detection	09/16/97
Aluminum	NS		340
Antimony	3	33	3
Arsenic	25	11	25
Barium	1000		1200
Beryllium	3	5.6	5.6
Cadmium	10	5.6	5.6
Calcium	NS		35000
Chromium	50	11	11
Cobalt	NS	56	56
Copper	200	28	28
Iron	300		720
Lead	25		25
Magnesium	35000Guid		9800
Manganese	300		110
Mercury	2		0.27
Nickel	NS	44	44
Potassium	NS	5600	5600
Selenium	10	5.6	5.6
Silver	50	11	11
Sodium	20000		20000
Thallium	4 Guid	11	11
Vanadium	NS	56	56
Zinc	300	22	22
Iron & Manganese	500		830
Benzene*	1	5	5
Trichloroethene*	5	5	5
Toluene*	5	5	5
MEK*(2-butanone)	50	5	
Benzo(a)anthracen	NS		ND
Benzo(b)floroanthe	.002Guid		ND
Benzo(k)floroathen	.002Guid		ND
Benzo(d)pyrene*	NS		ND
Chrysene*	.002Guid		ND
Cyanide*	200		ND

* Previous to landfill construction ; these compounds were found in drum disposal area , ash, debris & areas

Columbia Mills Groundwater LF-2S

ND: Sample Not Done
Blank Cell: Value < Detection limits

	Ug/l GW Stand.	Detection	09/16/97
Aluminum	NS		920
Antimony	3	33	
Arsenic	25	11	
Barium	1000		240
Beryllium	3	5.6	
Cadmium	10	5.6	
Calcium	NS		84000
Chromium	50	11	
Cobalt	NS	56	
Copper	200	28	
Iron	300		740
Lead	25	3.3	
Magnesium	35000Guid		13000
Manganese	300		56
Mercury	2	0.2	
Nickel	NS	44	
Potassium	NS	5600	
Selenium	10	5.6	
Silver	50	11	
Sodium	20000	5600	
Thallium	4 Guid	11	
Vanadium	NS	56	
Zinc	300	22	
Iron & Manganese	500		796
Benzene*	1	5	
Trichloroethene*	5	5	
Toluene*	5	5	
MEK*(2-butanone)	50	5	
Benzo(a)anthracen	NS		ND
Benzo(b)floroanthe	.002Guid		ND
Benzo(k)floroathen	.002Guid		ND
Benzo(d)pyrene*	NS		ND
Chrysene*	.002Guid		ND
Cyanide*	200		ND

* Previous to landfill construction ; these compounds were found in drum disposal area , ash, debris & oil

Columbia Mills Groundwater LF-2D

ND: Sample Not Done
Blank Cell: Value < Detection limits

	Ug/l GW Stand.	Detect		09/16/97
Aluminum	NS			320
Antimony	3	33		
Arsenic	25	11		
Barium	1000			270
Beryllium	3	5.6		
Cadmium	10	5.6		
Calcium	NS			67000
Chromium	50	11		
Cobalt	NS	56		
Copper	200	28		
Iron	300			120
Lead	25	3.3		4.5
Magnesium	35000Guid			14000
Manganese	300			180
Mercury	2	0.2		0.21
Nickel	NS	44		
Potassium	NS	5600		
Selenium	10	5.6		
Silver	50	11		
Sodium	20000	5600		
Thallium	4 Guid	11		
Vanadium	NS	56		
Zinc	300	22		
Iron & Manganese	500			300
Benzene*	1	5	2j	
Trichloroethene*	5	5		
Toluene*	5	5		
MEK*(2-butanone)	50	5		
Benzo(a)anthracen	NS		ND	
Benzo(b)floroanthe	.002Guid		ND	
Benzo(k)floroathen	.002Guid		ND	
Benzo(d)pyrene*	NS		ND	
Chrysene*	.002Guid		ND	
Cyanide*	200		ND	

* Previous to landfill construction ; these compounds were found in drum disposal area , ash, ~~dE~~ debris mess

Columbia Mills Groundwater LF-3S

ND: Sample Not Done
Blank Cell: Value < Detection limits

	Ug/l GW Stand.	Detection	09/16/97
Aluminum	NS		10000
Antimony	3	33	
Arsenic	25	11	14
Barium	1000		400
Beryllium	3	5.6	
Cadmium	10	5.6	
Calcium	NS		66000
Chromium	50	11	
Cobalt	NS	56	
Copper	200	28	33
Iron	300		25000
Lead	25	3.3	
Magnesium	35000Guid		17000
Manganese	300		610
Mercury	2	0.2	0.26
Nickel	NS	44	
Potassium	NS	5600	
Selenium	10	5.6	
Silver	50	11	
Sodium	20000	5600	47000
Thallium	4 Guid	11	
'anadium	NS	56	
Zinc	300	22	100
Iron & Manganese	500		25610
Benzene*	1	5	
Trichloroethene*	5	5	
Toluene*	5	5	
MEK*(2-butanone)	50	5	
Benzo(a)anthracen	NS		ND
Benzo(b)floroanthe	.002Guid		ND
Benzo(k)floroathen	.002Guid		ND
Benzo(d)pyrene*	NS		ND
Chrysene*	.002Guid		ND
Cyanide*	200		ND
Chloroform		5	1j

* Previous to landfill construction ; these compounds were found in drum disposal area , ash, debris area

Columbia Mills Groundwater LF-3D

ND: Sample Not Done
Blank Cell: Value < Detection limits

	Ug/l GW Stand.	Detection	09/16/97
Aluminum	NS		27000
Antimony	3	33	
Arsenic	25	11	
Barium	1000		440
Beryllium	3	5.6	
Cadmium	10	5.6	
Calcium	NS		84000
Chromium	50	11	
Cobalt	NS	56	
Copper	200	28	89
Iron	300		66000
Lead	25	3.3	8.3
Magnesium	35000Guid		25000
Manganese	300		3300
Mercury	2	0.2	
Nickel	NS	44	130
Potassium	NS	5600	11000
Selenium	10	5.6	
Silver	50	11	
Sodium	20000	5600	100000
Thallium	4 Guid	11	
'anadium	NS	56	78
Zinc	300	22	280
Iron & Manganese	500		69000
Benzene*	1	5	
Trichloroethene*	5	5	
Toluene*	5	5	
MEK*(2-butanone)	50	5	
Benzo(a)anthracen	NS		ND
Benzo(b)floroanthe	.002Guid		ND
Benzo(k)floroathen	.002Guid		ND
Benzo(d)pyrene*	NS		ND
Chrysene*	.002Guid		ND
Cyanide*	200		ND
Chloroform		5	1j

* Previous to landfill construction ; these compounds were found in drum disposal area , ash, and debris areas.

Field Notes

Columbia Mills
State Route 48
Minetto [T]
Oswego Co.

[Site ID № 738012]

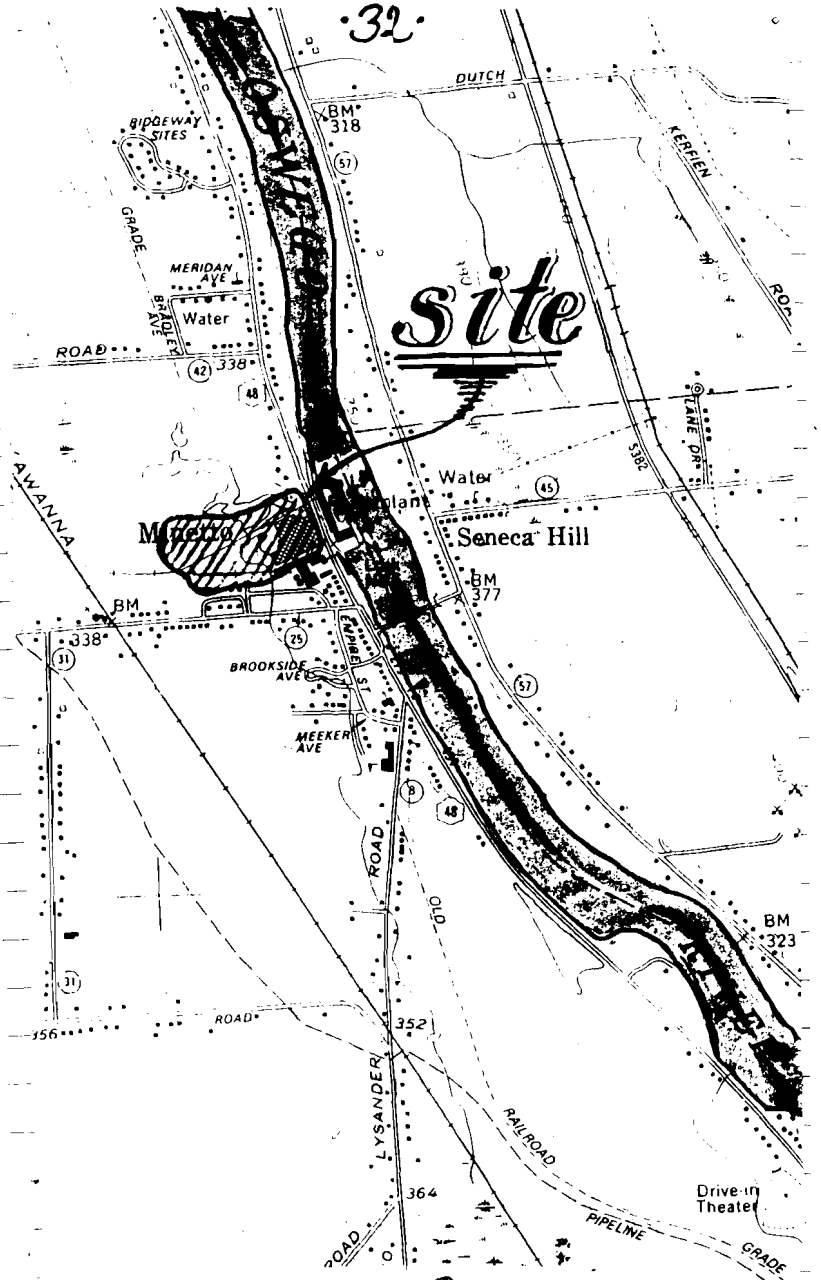
Columbia Mills
State Route 48
Minetto
Oswego County
Site ID № 738012

Columbia

O&M sampling of this site (annually scheduled) is planned for September 21-22, 1999. We will be sampling the eight shallow groundwater monitoring wells on the ~~property~~ landfill. We will also collect surface water "leachate" & sediment samples from the pond in the northeast corner of the property. All samples are to be analysed for volatile organics, metals & cyanide. Analysis will be done by Chemtech in Englewood, NJ. I placed an order for sample bottles w/ Jennifer Tacadena on Tuesday, September 14th, 1999. Bottles arrived on September 17th. All were in good shape.

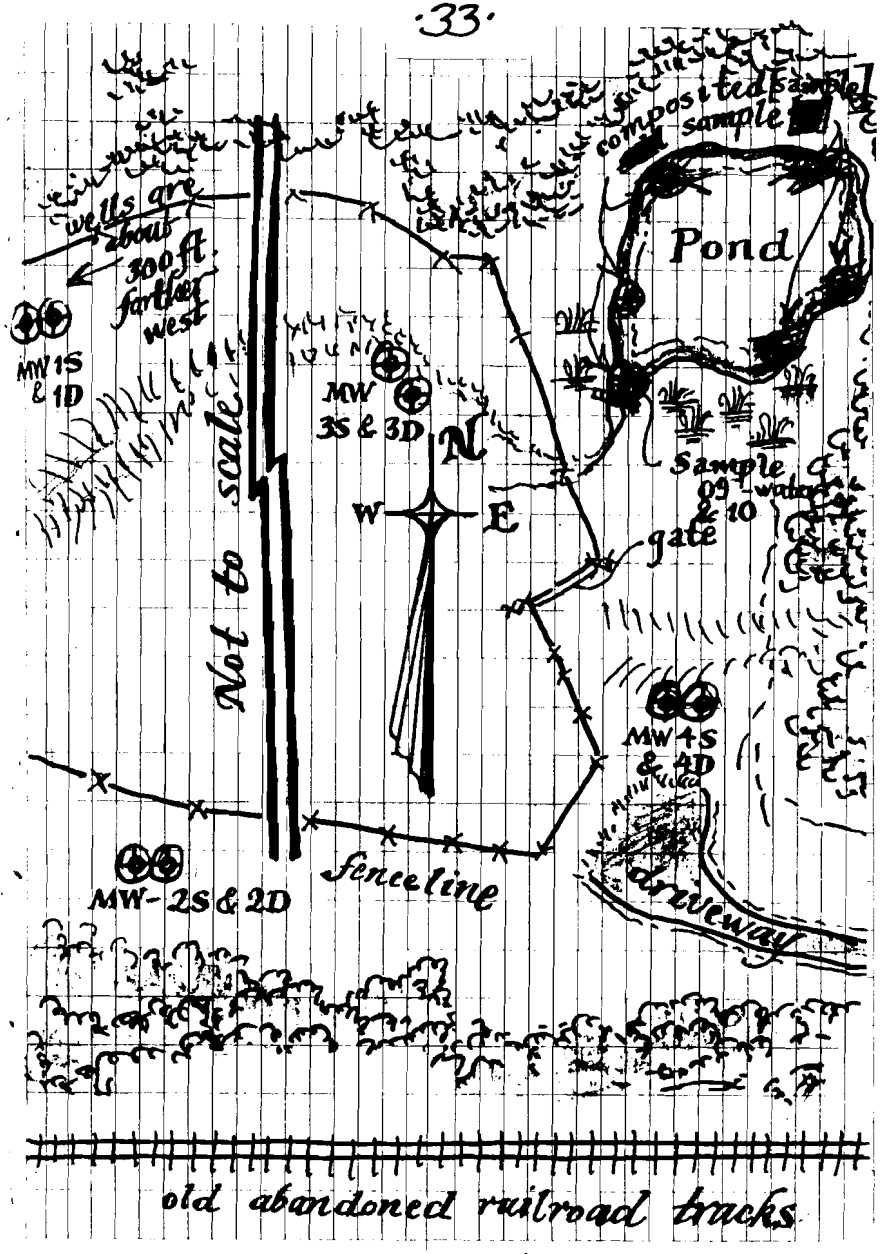
Site safety plan was prepared years ago & is still in effect...

·32·



·Location Map·

·33·



·Site sketch·

Arrived @ the Columbia Mills property on Tuesday, September 21, 1999 @ 10:05 AM.

Present for O&M sampling:

- TM Koch
- John Strang
- Chris Rossi
- John May - arrived @ 10:20 AM

Weather conditions @ the time of arrival on-site:

- Heavy overcast
- Very humid ~~(Sweaty)~~
- Slight intermittent drizzle
- Cool & breezy (high 50's to low 60's)

Upon arriving we met w/ Chris Rossi & began checking over the first 2 wells - just outside of the fenced in landfill. Tried to open the locks & discovered that they had rusted shut since last year.

Chris & John left the property & ventured off to a nearby hardware store in Oswego to get new locks & bolt cutters. After they returned we opened the wells & took water stat measurements, and purged all of the wells. Refer to monitoring well log sheets for specific stats. Four of the eight wells were dry before we could get 3 volumes out. The dry wells were: 25, 2D, 3S & 3D. These will have to be sampled tomorrow. After ~~to~~ bailing the wells we ~~went over~~ left for lunch & returned to the site @ about 2:30 P.M. Went over to the pond near the northeast corner of the site. We will collect two "leachate water samples near the outlet of the pond. The second leachate sample will be a duplicate.

* * * * * *

SH099-0921-B332-09 : 2:45 P.M.
Sample collected by John Strang @ the outlet of the pond. Water

was crystal clear & no odor was noted. Does not look like leachate, ~~normally~~ because it is crystal clear no sheen noted, nor any visible discoloration. We also ~~monitored~~ measured the approximate flow rate of this "leachate." It was timed @ 400 cc in 5 seconds. this converts to 80 cc/second. We also checked the pH; it was 6.6.

SH099-0921-B332-10: 2:50 P.M. Sample collected by John Strang. This is the duplicate sample of B332-09. "Leachate" was identical in appearance to B332-09 – as would be expected.

After taking the "leachate" sample, John Strang went around the south west corner of the pond & looked for spots to collect a sediment sample. He took ~~two~~ scoops of sediments from two locations. ~~finally~~

SH099-0921-B332-11: 3:00 P.M. Collected by John Strang. Sediment was brownish-grey and slightly gritty. There was some dark vegetation mixed in, but basically little odor noted.

After completing the sediment sampling we went back to collect groundwater samples from wells 2S, 2D, 4S, & 4D. Refer to the monitoring well log sheets for specific details. After collecting the last sample for the day; 4D @ 3:45 P.M. we reloaded the van & left the site @ about 4:20 P.M. We will return tommorow morning to collect samples from Wells 2S, 2D, 3S & 3D.

* * * * * * * * * *

Returned to the Columbia Mills property on Wednesday, September 22, 1999 @ 7:40 AM.

Weather conditions @ the time

of arrival on-site:

- Overcast
- Humid
- Cool (mid 50°s)
- Dreary conditions

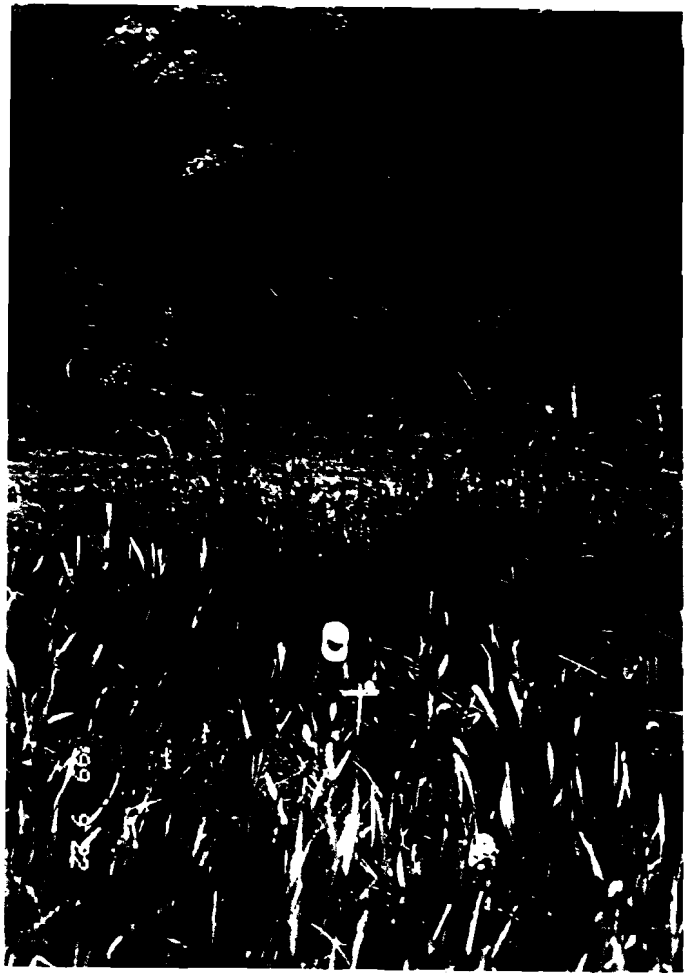
Sampling began @ 7:50 AM on Well 2S. Followed up with Well 2D, 3S & 3D. Wells 3S & 3D recovered very poorly. In fact, recovery was so slow that we could not fill all of the sample bottles, so we decided not to take cyanide samples @ these wells. Refer to well log sheets for stats.

This completed our sampling work @ Columbia Mills. Packed everything back into the van & left the site @ approximately 8:35 AM. Before heading back to Albany I stopped off @ the nearby "mini-mart" & purchased ice for sample preservation. I completed all of the necessary sample submittal forms during our drive back to Albany.

Samples were dropped off @ the UPS office on Wade Road in Colonie @ 11:52 AM.

I called Jemiah Tacadena of Chemtech on the afternoon of September 23, 1999. She informed me that all samples arrived in good shape & at the proper temperature. All paperwork submittals were also in order.

John Strang taking a pH reading from the "leachate" sample collected from the outlet of the pond on site.



John Strang collecting part of the composited sediment sample.

End of Field Notes...

Columbia Mills 738012

Annual Monitoring

September 21 + 22, 1999 (all results ug/l or ppb)

Sample ID	MW	Volatiles	Cyanide	Metals Ba	Fe	Mg	Mn	Zn
B332-01	1S	ND 10U	4.0U (14800)	475	2370	11400	106	25.1
-02	1D	ND 10U	4.0U (19700)	1180	540	9160	99.6	23.5
-03	4S	ND 10U	4.0U (6580)	302	623	9270	339	20.8
-04	4D	ND 10U	4.0U (64700)	362	400	12500	222	21.2
-05	2S	ND 10U	4.0U (9750)	280	2820	13400	122	25.5
-06	2D	ND 10U	4.0U (8440)	253	586	14200	180	22.4
-07	3S	ND 10U	NR (20600)	383	24700	18000	522	81.3
-08	3D	Methylene Chloride 3.3J all others 10U	NR (107000)	406	38300	14800	759	114
-09	Leachate	ND 10U	4.0U (14600)	180 B	141	13900	80.8	33.3
-10	Leachate	ND 10U	4.0U (15300)	186 B	106	14400	14.6 B	36.6
-11	Pond Sediment	Methylene Chloride 10J Acetone 17J all others 20U	0.41U (291)	143	15500	3460	1160	116
GW LIMITS		200	(20000)	1000	300	35000	300	2000
Leachate Permit limits		60		300	300	—	4000	400

JMString 2/2/00

MONITORING WELL LOG SHEET

Site Location: Columbia Mills Site ID No. 738012

Site Address: State Route 48
Minetto, NY 13115

Monitoring Well No.: 1S Well type: stick up ☒ flush mount ☐

Physical condition of well: good ☒ fair ☐ poor ☐

Comment: Wells located down in the low area in the northwest corner of the landfill

Was well locked?: Yes ☒ No ☐ Lock must be replaced

Water table & water volume: [prior to 1st purging]

- Depth from top of well to top of water table [A]: 6.1
- Depth from top of well to bottom of well [B]: 16.5 ft.
- Length of the water column [B - A = C] [C]: 10.4
- Volume of water [gallons] C x .163 = [V]: 1.7 gallons

1.50"	.092
2.00"	.163
3.00"	.367
4.00"	.653

Purging information:

- Gallons of water in well: 1.7
- Three well volumes are: 5.1
- Number of volumes purged: over 4 7 gals (total)
- Did well run dry? Yes ☐ No ☒
- Date of purging: 9/21/99
- Purging times: 12:35 PM to 12:55 PM
- Purging method: hand bailer ☒ grundfos pump ☐ water bug ☐ waterra pump ☐
- Physical appearance of water:

  Color Rust/Orange Odor None

- Turbidity: ☐ Clear ☐ Very Low ☐ Low ☒ Medium ☐ Medium High ☐ High ☐ Opaque
- Water Stats:
  - Conductivity: — Ph: —
  - Temperature: — Turbidity: —

Sampling Information:

- Sampling date: 9/21/99
- Sampling time: 3:21 P.M
- Sample taken by: TM Koch & John Strang
- Physical appearance of water:
- Color slight turbidity Odor none
- Turbidity: ☐ Clear ☒ Very Low ☐ Low ☐ Medium ☐ Medium High ☐ High ☐ Opaque

Water Stats:

- Conductivity: — pH: —
- Temperature: — Turbidity: —

SAMPLE NUMBER:

B332 - 01

MONITORING WELL LOG SHEET

Site Location: Columbia Mills Site ID No. 738012

Site Address: State Route 48
Minetto, NY 13115

Monitoring Well No.: 1D Well type: stick up ☒ flush mount ☐

Physical condition of well: good ☐ fair ☐ poor ☐

Comment: Located in the far northwest corner of the landfill back by the trees...

Was well locked?: Yes ☒ No ☐ Lock must be replaced

Water table & water volume: [prior to 1st purging]

- Depth from top of well to top of water table [A]: 3.6
- Depth from top of well to bottom of well [B]: 28.1 ft.
- Length of the water column [B - A = C] [C]: 24.5
- Volume of water [gallons] C x .163 = [V]: 3.99 gallons

1.50"	.092
2.00"	.163
3.00"	.367
4.00"	.653

Purging information:

- Gallons of water in well: 4
- Three well volumes are: 12
- Number of volumes purged: over 3 12+
- Did well run dry? Yes ☐ No ☒
- Date of purging: 9/21/99
- Purging times: 12:35 to 1:06 pm
- Purging method: hand bailer ☒ grundfos pump ☐ water bug ☐ waterra pump ☐
- Physical appearance of water:

  Color Clear Odor No Odor

- Turbidity: ☒ Clear ☐ Very Low ☐ Low ☐ Medium ☐ Medium High ☐ High ☐ Opaque
- Water Stats:
  - Conductivity: — Ph: —
  - Temperature: — Turbidity: —

Sampling Information:

- Sampling date: Sept. 21, 1999
- Sampling time: 3:25 P.M.
- Sample taken by: TM Koch, John Strang
- Physical appearance of water:
- Color Crystal clear Odor none
- Turbidity: ☒ Clear ☐ Very Low ☐ Low ☐ Medium ☐ Medium High ☐ High ☐ Opaque

Water Stats:

- Conductivity: — pH: —
- Temperature: — Turbidity: —

SAMPLE NUMBER:

B332 - 02

MONITORING WELL LOG SHEET

Site Location: Columbia Mills Site ID No. 738012

Site Address: State Route 48
Minetto, NY 13115

Monitoring Well No.: 4S Well type: stick up ☒ flush mount ☐

Physical condition of well: good ☒ fair ☐ poor ☐

Comment: Lock had to be replaced

Was well locked?: Yes ☒ No ☐

Water table & water volume: [prior to 1st purging]

- Depth from top of well to top of water table [A]: 12.2
- Depth from top of well to bottom of well [B]: 17.3 ft.
- Length of the water column [B - A = C] [C]: 5.1
- Volume of water [gallons] C x .163 = [V]: 0.83 gallons

1.50"	.092
2.00"	.163
3.00"	.367
4.00"	.653

Purging information:

- Gallons of water in well: 0.83
- Three well volumes are: 2.5
- Number of volumes purged: 3+
- Did well run dry? Yes ☐ No ☒
- Date of purging: 9/21/99
- Purging times: ? to 12:10 PM
- Purging method: hand bailer ☒ grundfos pump ☐ water bug ☐ waterra pump ☐
- Physical appearance of water:
  Color Reddish-brown Odor musty
- Turbidity: ☐ Clear ☐ Very Low ☐ Low ☐ Medium ☐ Medium High ☒ High ☐ Opaque
- Water Stats:
  - Conductivity: — Ph: —
  - Temperature: — Turbidity: —

Sampling Information:

- Sampling date: 9/21/99
- Sampling time: 3:40 P.M.
- Sample taken by: TM Koch & John Strang
- Physical appearance of water:
- Color slightly pinkish-grey Odor none
- Turbidity: ☐ Clear ☐ Very Low ☒ Low ☐ Medium ☐ Medium High ☐ High ☐ Opaque

Water Stats:

- Conductivity: — pH: —
- Temperature: — Turbidity: —

SAMPLE NUMBER:

B332-03

MONITORING WELL LOG SHEET

Site Location: Columbia Mills Site ID No. 738012

Site Address: State Route 48
Minetto, NY 13115

Monitoring Well No.: 4D Well type: stick up ☒ flush mount ☐

Physical condition of well: good ☒ fair ☐ poor ☐

Comment: Pretty clear,

Was well locked?: Yes ☒ No ☐ Lock had to be replaced

Water table & water volume: [prior to 1st purging]

- Depth from top of well to top of water table [A]: 11.0 ft
- Depth from top of well to bottom of well [B]: 27.6 ft.
- Length of the water column [B - A = C] [C]: 16.0 ft.
- Volume of water [gallons] C x .163 = [V]: 2.6 gallons

1.50"	.092
2.00"	.163
3.00"	.367
4.00"	.653

Purging information:

- Gallons of water in well: 2.6
- Three well volumes are: 7.8
- Number of volumes purged: over 3
- Did well run dry? Yes ☐ No ☒
- Date of purging: 9/21/99
- Purging times: 11:00 to 11:20
- Purging method: hand bailer ☒ grundfos pump ☐ water bug ☐ waterra pump ☐
- Physical appearance of water:

  Color Grey to Clear Odor None

- Turbidity: ☐ Clear ☒ Very Low ☒ Low ☐ Medium ☒ Medium High ☐ High ☐ Opaque
- Water Stats:
  - Conductivity: — pH: —
  - Temperature: — Turbidity: —

Sampling Information:

- Sampling date: 9/21/99
- Sampling time: 3:45 P.M.
- Sample taken by: TM Koch & John Strang
- Physical appearance of water:
- Color clear Odor none
- Turbidity: ☒ Clear ☐ Very Low ☐ Low ☐ Medium ☐ Medium High ☐ High ☐ Opaque

Water Stats:

- Conductivity: — pH: —
- Temperature: — Turbidity: —

SAMPLE NUMBER:

B332-04

MONITORING WELL LOG SHEET

Site Location: Columbia Mills Site ID No. 738012

Site Address: State Route 48
Minetto, NY 13115

Monitoring Well No.: 2S Well type: stick up ☒ flush mount ☐

Physical condition of well: good ☒ fair ☐ poor ☐

Comment: This well is also outside the fenceline near the old RR tracks

Was well locked?: Yes ☒ No ☐

Water table & water volume: [prior to 1st purging]

- Depth from top of well to top of water table [A]: 14.7
- Depth from top of well to bottom of well [B]: 17.5 ft.
- Length of the water column [B - A = C] [C]: 2.8
- Volume of water [gallons] C x .163 = [V]: .5 gallons

1.50"	.092
2.00"	.163
3.00"	.367
4.00"	.653

Purging information:

- Gallons of water in well: 0.5
- Three well volumes are: 1.5
- Number of volumes purged: Over ~~3~~ 1½V.
- Did well run dry? Yes ☒ No ☐
- Date of purging: 9/21/99
- Purging times: 1:30 to 1:45 PM
- Purging method: hand bailer ☒ grundfos pump ☐ water bug ☐ waterra pump ☐
- Physical appearance of water:

  Color Very rusty Odor _____

- Turbidity: ☐ Clear ☐ Very Low ☐ Low ☐ Medium ☒ Medium High ☒ High ☐ Opaque
- Water Stats:
  - Conductivity: — pH: —
  - Temperature: — Turbidity: —

Sampling Information:

- Sampling date: 9/22/99
- Sampling time: 7:50 AM
- Sample taken by: TM Koch & John Strang
- Physical appearance of water:
- Color Rusty Odor none
- Turbidity: ☐ Clear ☐ Very Low ☐ Low ☒ Medium ☒ Medium High ☐ High ☐ Opaque

Water Stats:

- Conductivity: — pH: —
- Temperature: — Turbidity: —

SAMPLE NUMBER:

B332-05

MONITORING WELL LOG SHEET

Site Location: Columbia Mills Site ID No. 738012

Site Address: State Route 48
Minetto, NY 13115

Monitoring Well No.: 2D Well type: stick up ☒ flush mount ☐

Physical condition of well: good ☒ fair ☐ poor ☐

Comment: Well located outside the fenceline
Replaced the old lock

Was well locked?: Yes ☒ No ☐

Water table & water volume: [prior to 1st purging]

- Depth from top of well to top of water table [A]: 14.7
- Depth from top of well to bottom of well [B]: 27.2 ft.
- Length of the water column [B - A = C] [C]: 12.5
- Volume of water [gallons] C x .163 = [V]: 2.0 gallons

1.50"	.092
2.00"	.163
3.00"	.367
4.00"	.653

Purging information:

- Gallons of water in well: 2.0
- Three well volumes are: 6.0
- Number of volumes purged: ~~Over 3V.~~ About 1½ V.
- Did well run dry? Yes ☐ No ☒
- Date of purging: Sept 21, 1999
- Purging times: 1:40 PM to 1:50 PM
- Purging method: hand bailer ☒ grundfos pump ☐ water bug ☐ waterra pump ☐
- Physical appearance of water:

  Color Rusty Odor none

- Turbidity: ☐ Clear ☐ Very Low ☐ Low ☐ Medium ☒ Medium High ☒ High ☒ Opaque
- Water Stats:
  - Conductivity: — pH: —
  - Temperature: — Turbidity: —

Sampling Information:

- Sampling date: 9/22/99
- Sampling time: 8:00 AM
- Sample taken by: TM Koch & John Strang
- Physical appearance of water:
- Color Clear Odor none
- Turbidity: ☒ Clear ☒ Very Low ☐ Low ☐ Medium ☐ Medium High ☐ High ☐ Opaque

Water Stats:

- Conductivity: — pH: —
- Temperature: — Turbidity: —

SAMPLE NUMBER:

B332 - 06

MONITORING WELL LOG SHEET

Site Location: Columbia Mills Site ID No. 738012

Site Address: State Route 48
Minetto, NY 13115

Monitoring Well No.: 38 Well type: stick up ☒ flush mount ☐ sprayed before purging

Physical condition of well: good ☐ fair ☐ poor ☐ needs new lock

Comment: Major killer bee infestation
Extremely slow recovery

Was well locked?: Yes ☒ No ☐ cut old lock off w/ bolt cutters

Water table & water volume: [prior to 1st purging]

- Depth from top of well to top of water table [A]: 7.7
- Depth from top of well to bottom of well [B]: 17.5 ft.
- Length of the water column [B - A = C] [C]: 9.8
- Volume of water [gallons] C x .163 = [V]: 1.6 gallons

→ 1.50" = .092
2.00" = .163
3.00" = .367
4.00" = .653

Purging information:

- Gallons of water in well: 1.6
- Three well volumes are: 4.8
- Number of ~~volumes~~ gallons purged: 2.5± g.
- Did well run dry? Yes ☒ No ☐
- Date of purging: 9/21/99 very slow recovery
- Purging times: 11:55 AM± to 12:05 PM±
- Purging method: hand bailer ☒ grundfos pump ☐ water bug ☐ waterra pump ☐
- Physical appearance of water:
  Color Reddish brown Odor none
- Turbidity: ☐ Clear ☐ Very Low ☐ Low ☐ Medium ☐ Medium High ☒ High ☒ Opaque
- Water Stats:
  - Conductivity: — pH: —
  - Temperature: — Turbidity: —

Sampling Information:

- Sampling date: 9/22/99
- Sampling time: 8:15 AM
- Sample taken by: TM Koch & John Strang
- Physical appearance of water:
- Color reddish. Odor none
- Turbidity: ☐ Clear ☐ Very Low ☐ Low ☐ Medium ☒ Medium High ☒ High ☐ Opaque

Water Stats:

- Conductivity: — pH: —
- Temperature: — Turbidity: —

Very poor recovery

SAMPLE NUMBER:

B332-07

Not enough water to do cyanides

MONITORING WELL LOG SHEET

Site Location: Columbia Mills Site ID No. 738012

Site Address: State Route 48
Minetto, NY 13115

Monitoring Well No.: 3D Well type: stick up ☒ flush mount ☐

Physical condition of well: good ☒ fair ☐ poor ☐

Comment: Extremely slow recovery on this well ~ even ~~after today~~ a day after purging needs new locks

Was well locked?: Yes ☒ No ☐ cut old lock off w/ bolt cutters

Water table & water volume: [prior to 1st purging]

- Depth from top of well to top of water table [A]: 15.5
- Depth from top of well to bottom of well [B]: 26.2 ft.
- Length of the water column [B - A = C] [C]: 10.7
- Volume of water [gallons] C x .163 = [V]: 1.7 gallons

1.50"	.092
2.00"	.163
3.00"	.367
4.00"	.653

Purging information:

- Gallons of water in well: 1.7
- Three well volumes are: 5.2
- Number of ~~volumes~~ gallons purged: 2.5 g.
- Did well run dry? Yes ☒ No ☐
- Date of purging: 9/21/99
- Purging times: 12:10 PM to 12:25 PM
- Purging method: hand bailer ☐ grundfos pump ☐ water bug ☐ waterra pump ☐
- Physical appearance of water: started clear
  Color turned Odor none
  cloudy - rusty colored
- Turbidity: ☒ Clear ☐ Very Low ☐ Low ☐ Medium ☐ Medium High ☒ High ☐ Opaque
- Water Stats:
  - Conductivity: — pH: —
  - Temperature: — Turbidity: —

Sampling Information:

- Sampling date: 9/22/99
- Sampling time: 8:20 AM
- Sample taken by: TM Koch & John Strang
- Physical appearance of water:
- Color Rusty Odor none
- Turbidity: ☐ Clear ☐ Very Low ☐ Low ☐ Medium ☐ Medium High ☐ High ☐ Opaque

Water Stats:

- Conductivity: — pH: —
- Temperature: — Turbidity: —

SAMPLE NUMBER:

B332 - 08

No cyanide sample taken
Not enough water

CHEMTECH

CHAIN OF CUSTODY RECORD

Please check one:

☒ 110 Route 4
Englewood, NJ 07631
(201) 567-6868
Fax (201) 567-1333

☐ 515 Route 9 South
Barnegat, NJ 08005
(609) 698-0199
Fax (609) 698-0910

☐ ANALAB/ICM Division
205 Campus Plaza 1
Edison, NJ 08837
Phone (732) 225-4111 Fax (732) 225-4110

CHEMTECH JOB NO.:

CHEMTECH QUOTE NO.:

CLIENT INFORMATION

REPORT TO BE SENT TO:

COMPANY: NYSDEC: E-R

ADDRESS: Room 252: 50 Wolf Rd.

CITY: Albany STATE: NY ZIP: 12233-1010

ATTENTION: TM Koch

PHONE: 518-457-0747 FAX: 518-457-8989

PROJECT INFORMATION

PROJECT NAME: Columbia

PROJECT NO.: 1

PROJECT MANAGER: TM Koch

LOCATION: Albany

PHONE: 518-457-0747 FAX: 518-457-8989

BILLING INFORMATION

BILL TO: PO #:

ADDRESS:

CITY: STATE: ZIP:

ATTENTION: PHONE:

DATA TURNAROUND INFORMATION

APPROVED BY: (CHEMTECH'S PERSONNEL)

- ☐ 21 DAYS
- ☐ 14 DAYS
- ☐ 7 DAYS
- ☐ OTHER

21 DAY TURNAROUND HARDCOPY, EMERGENCY OR RUSH IS FAX DATA UNLESS PREVIOUSLY APPROVED.

DATA DELIVERABLE INFORMATION

- ☐ NJ REDUCED
- ☐ NJ CLP
- ☐ USEPA CLP
- ☐ NYS CLP
- ☐ OTHER
- ☐ CHEMTECH FORMAT
- ☐ RESULTS ONLY
- ☐ NYS ASP
- ☐ DISKETTES

ANALYSIS

1 Aqml VOA vials
2 1 pt. plastic: metals
3 1 pt. plastic: cyanide
4 4 oz. bottles
5
6
7
8
9

CHEMTECH SAMPLE ID	SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	PRESERVATIVES A 1	B 2	D 3	4	5	6	7	8	9	COMMENTS
1.	SH099-0921-B332-01	g.w.		X	9/21/99	3:21 PM	4	2	1	1	–						MW-1S
2.	" " " " " -02	g.w.		X	9/21/99	3:25 PM	4	2	1	1	–						MW-1D
3.	" " " " " -03	g.w.		X	9/21/99	3:40 PM	4	2	1	1	–						MW-4S
4.	" " " " " -04	g.w.		X	9/21/99	3:45 PM	4	2	1	1	–						MW-4D
5.	-05	g.w.		X	9/22/99	7:50 AM	4	2	1	1	–						MW-2S
6.	-06	g.w.		X	9/22/99	8:00 AM	4	2	1	1	–						MW-2D
7.	-07	g.w.		X	9/22/99	8:15 AM	3	2	1	–	–						MW-3S
8.	-08	g.w.		X	9/22/99	8:20 AM	3	2	1	–	–						MW-3D

← Specify Preservatives
A – HCl B – HNO_3
C – H_2SO_4 D – NaOH
E – ICE F – Other

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER: 1 TM Koch	DATE/TIME: 9/22/99: 11:52 AM	RECEIVED BY:
RELINQUISHED BY: 2.	DATE/TIME:	RECEIVED BY: 2.
RELINQUISHED BY: 3.	DATE/TIME:	RECEIVED FOR LAB BY: 3.

Conditions of bottles or coolers at receipt: ☐ Compliant ☐ Non-Compliant ☐ Temp. of Cooler _____

Comments: Samples B332-07 & 08: no cyanide sample due to lack of water

Page 1 of 2

Shipment Complete: Yes _____ No _____

WHITE – CHEMTECH COPY FOR RETURN TO CLIENT YELLOW – CHEMTECH COPY PINK – SAMPLER COPY

CHEMTECH
CHAIN OF CUSTODY RECORD

Please check one:

☒ 110 Route 4, Englewood, NJ 07631, (201) 567-6868, Fax (201) 567-1333

☐ 515 Route 9 South, Barnegat, NJ 08005, (609) 698-0199, Fax (609) 698-0910

☐ ANALAB/ICM Division, 205 Campus Plaza 1, Edison, NJ 08837, Phone (732) 225-4111 Fax (732) 225-4110

CHEMTECH JOB NO.:

CHEMTECH QUOTE NO.:

CLIENT INFORMATION

REPORT TO BE SENT TO:

COMPANY: NYSDEC : E-R

ADDRESS: Room 252 : 50 Wolf Rd.

CITY: Albany STATE: NY ZIP: 12233-7010

ATTENTION: TM Koch

PHONE: 518-457-0747 FAX: 518-457-8989

PROJECT INFORMATION

PROJECT NAME: Columbia

PROJECT NO.: 1

PROJECT MANAGER: TM Koch

LOCATION: Albany

PHONE: 518-457-0747 FAX: 457-8989

BILLING INFORMATION

BILL TO: PO #:

ADDRESS:

CITY: STATE: ZIP:

ATTENTION: PHONE:

DATA TURNAROUND INFORMATION

☐ 21 DAYS ☐ 14 DAYS ☐ 7 DAYS ☐ OTHER

APPROVED BY: (CHEMTECH'S PERSONNEL)

21 DAY TURNAROUND HARDCOPY, EMERGENCY OR RUSH IS FAX DATA UNLESS PREVIOUSLY APPROVED.

DATA DELIVERABLE INFORMATION

☐ NJ REDUCED ☐ NJ CLP ☐ USEPA CLP ☐ NYS CLP ☐ OTHER

☐ CHEMTECH FORMAT ☐ RESULTS ONLY ☐ NYS ASP ☐ DISKETTES

ANALYSIS

1 40 ml VOA vials; 2 1 pt. plastic: metals; 3 1 pt. plastic: cyanide; 4 4 oz. bottles; 5; 6; 7; 8; 9

CHEMTECH SAMPLE ID	SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	PRESERVATIVES 1 (A)	2 (B)	3 (D)	4	5	6	7	8	9	COMMENTS
1.	SH099-09--B332-09			X	9/21/99		4	2	1	1	-						Leachate water
2.	" " " " -10			X	9/21/99		4	2	1	1	-						Leachate water
3.	" " " " -11			X	" "		3	-	-	-	3						Sediment from pond
4.	[illegible]			X	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]							
5.	" " " " -TB			X	" "												TRIP BLANK
6.																	
7.																	
8.																	

← Specify Preservatives: A – HCl; B – HNO_3; C – H_2SO_4; D – NaOH; E – ICE; F – Other

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

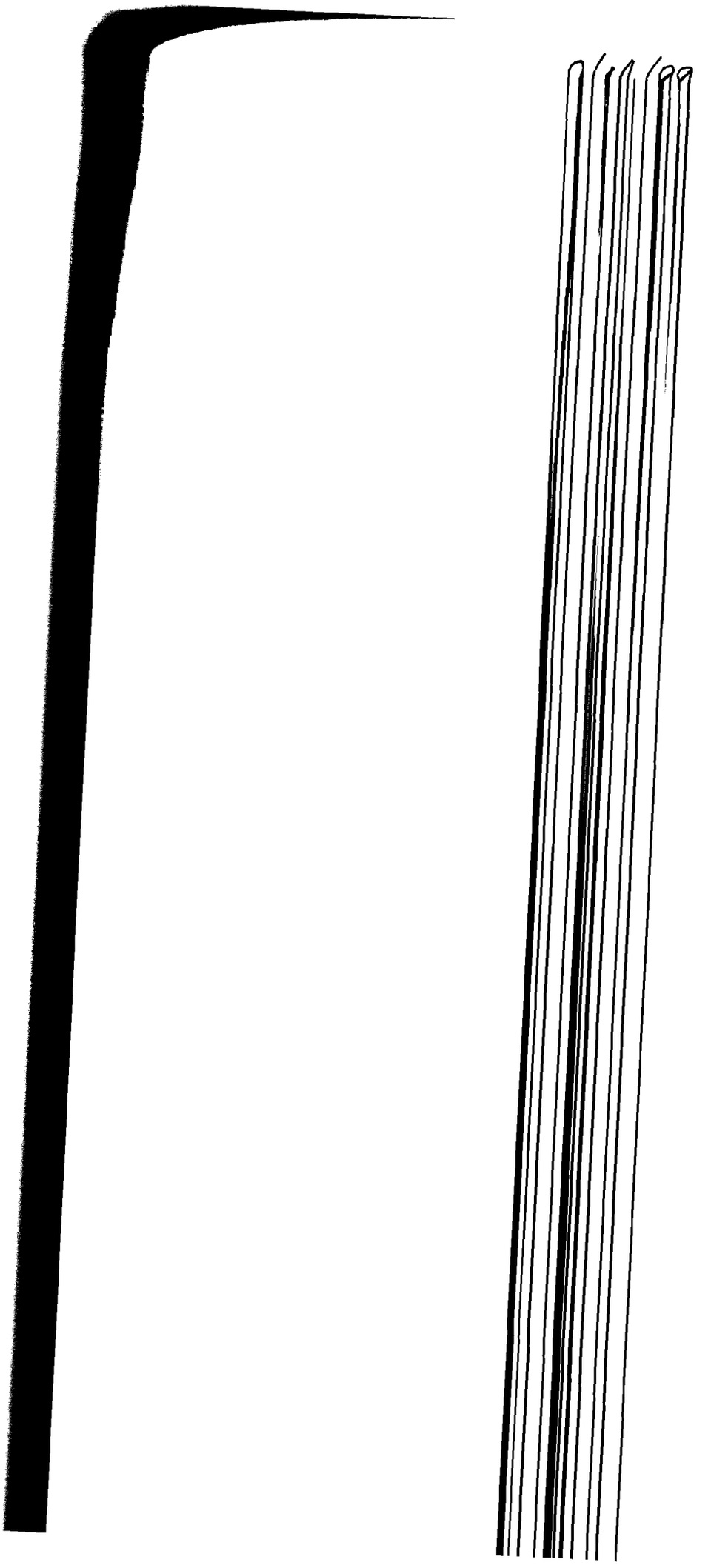
RELINQUISHED BY SAMPLER:	DATE/TIME:	RECEIVED BY:
1. TM Koch	9/22/99 : 11:52 AM	
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:
2.		2.
RELINQUISHED BY:	DATE/TIME:	RECEIVED FOR LAB BY:
3.		3.

Conditions of bottles or coolers at receipt: ☐ Compliant ☐ Non-Compliant ☐ Temp. of Cooler _____

Comments:

Page 2 of 2

Shipment Complete: Yes _____ No _____



DIVISION OF ENVIRONMENTAL REMEDIATION

CONTRACT LABORATORY WORK REQUEST

DATE 9/14/99

SAMPLER TM Koch PHONE # 7-0747

SITE NAME Columbia Mills

SITE REGISTRY # 738012

APPROXIMATE SAMPLING DATE Sept. 21-22, '99

NUMBER OF SAMPLES	SAMPLE MATRIX	ANALYSIS REQUESTED
10	water	VOAs, metals & cyanide
2	sediment	" " " "

COMMENTS Columbia Analytical is first choice; Chemtech is second choice

LAB REQUESTED Columbia Analytical

LAB ASSIGNED Chemtech

9/14/99

[redacted]/John/Sara;

R/7 Sampling adventure itinerary:

9/21: Leave 50 Wolf early 7 AM ± Venture up to Columbia Mills in lovely Minetto, N.Y. Extensive groundwater, leachate & sediment sampling – beyond anticipated levels of normal human endurance. Overnite @ the Days Inn in Oswego, N.Y. (315)-343-3136

9/22: Complete all sampling endeavors Possible side trip to Philo's pedophile pleasure palace in downtown Pulaski if there is enough time. Return to Albany & deliver samples to the UPS office on Wade Road.

September 15+16, 1998

Sample ID	Mon. Well	VOA's	Cyanide	Metals	Semi-Voa's
B332-01	1S	ND 10U	[illegible]	Ba 630 [illegible] Fe 610 Zn [illegible]	OK
-02	1D	ND [illegible]	[illegible]	Ba [illegible] Fe 480 Zn [illegible]	OK
-03	2S	ND 10U	[illegible]	Ba 500 [illegible] 400 Fe 6400 Zn [illegible]	OK 3 TICS
-04	2D	ND 10U	[illegible]	Ba 300 [illegible] 250 Fe 40 Zn [illegible]	OK
-05	3S	ND 10U	[illegible]	Ba 520 Mn 740 Fe 22000 Zn [illegible]	not enough wat.
-06	3D	Benzene 1 J all others ND 10U	[illegible]	not enough H_2O	[illegible]
-07	4S	ND 10U	0.010 U	Ba 300 Mn [illegible] Fe 1300 Zn [illegible]	OK
-08	4D	ND 10U	0.010 U	Ba 310 Mn [illegible] Fe 500 Zn 10 U	OK 2 TICS
-09	Leachate	[illegible]	0.010 U	MEETS [illegible] Ba 1700 Fe 50 U	OK
-10	Pond Sediment	Acetone [illegible] all others 15 U	0.752 U	Ba [illegible] Fe 9100 Zn 42	OK 6 TICS

Ba	[illegible]	300
Fe	[illegible]	300
Zn	[illegible]	4

1998 ANNUAL MONITORING

NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL REMEDIATION
CHAIN OF CUSTODY RECORD

Print legibly in ink:

Site Name: Columbia M.Pls Proj Manager: Strang, J.
Site Code: 738012 Region: 7 Bureau / Region:
TA Code: B332 Phone Number: 457-0927

VOA (40 ML)	BNA; PEST; PCBs (1 LITER)	METALS (preserved 500 ML/ 1 LITER)	SOIL JARS
11 sets plus TRIPBLANK		11	3 VOA/Metals

Bottles Released by: (Signature, Date/Time) Cheryl L Houck 9/12/97
Received by: (Signature, Date/Time)

Sampler complete items 1 thru 8, one sample per line. Check analyses requested.

(1)FIELD ID	(2)MATRIX *	(3)DATE COLLECTED	(4)VOA	(5)BNA	(6)PEST PCB	(7)METALS	(8)COMMENTS (or SPECIAL ANALYSIS)	LAB SAMPLE ID Lab use only
LF-1S	GW	9/16/97 15:30	✓			✓		797-260-111
LF-1D	GW	9/16/97 15:35	✓			✓	MS/MSD taken here for both metals and VOAs	797-260-112
LF-2S	GW	9/17/97 9:07	✓			✓		797-260-113
LF-2D		9/17/97 9:00	✓			✓		797-260-114
LF-3S		9/17/97 8:42	✓			✓		797-260-115
LF-3D		9/17/97 8:45	✓			✓		797-260-116
LF-4S		9/17/97 8:30	✓			✓		797-260-117
LF-4D		9/17/97 8:35	✓			✓		797-260-118
Sediment	SOIL	9/16/97 14:45	✓			✓	Composite	797-260-119
* Leachate	GW	9/16/97 14:55	~~✓~~			✓		797-260-120
TRIP-BLANK								797-260-121
							Voa septums were defective + previously used - would not be airtight. ~~Used~~ Replaced by bottles from Chris Rossi, Region 7 (From DUSA).	

*-As Per J. Strong - No VOA on Leachate
Leachate Metal marked 14:30 JRS

* Please categorize the sample matrix as one of the following:

GW - Groundwater	LEACH - Leachate
SW - Surface water	WASTE - Specify
SOIL - Soil	OTHER - Specify
SED - Sediment	TB - Trip Blank

Shipping Address:
DER LAB
431 ROUTE 50 SOUTH
SARATOGA SPRINGS, NY 12866
ATT: Cheryl Houck
Phone: 518-584-7774

COLLECTED BY: (Signature,date/time) JRStrang 9/16+9/17/97.
RELINQUISHED BY: (Signature,date/time) JRStrang 9/17/97 12:46

If you have any questions please call Fred Woodward at 518-457-3252 (office) or 518-584-8588 (lab).

LABORATORY ACCESSION BY: (Signature,date/time)

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

INVESTIGATION SUPPORT

ANALYSIS REQUEST FORM

Site name Columbia Mills Date 9/10/97

Registry number 7-38-012 T&A code B332

Sample submission date 9/17/97 Would like bottles on 9/15/97

Samples submitted by John Strang (OZM Section) Phone Number 7-0927

Person to receive report Strang

Water: VOA 11 BNA ____ PCB/PEST ____ METALS 11 and ~~cyanide~~

SOIL: VOA 3 BNA ____ PCB/PEST ____ METALS 3 and ~~cyanide~~

OTHER: VOA ____ BNA ____ PCB/PEST ____ METALS ____

COMMENTS:

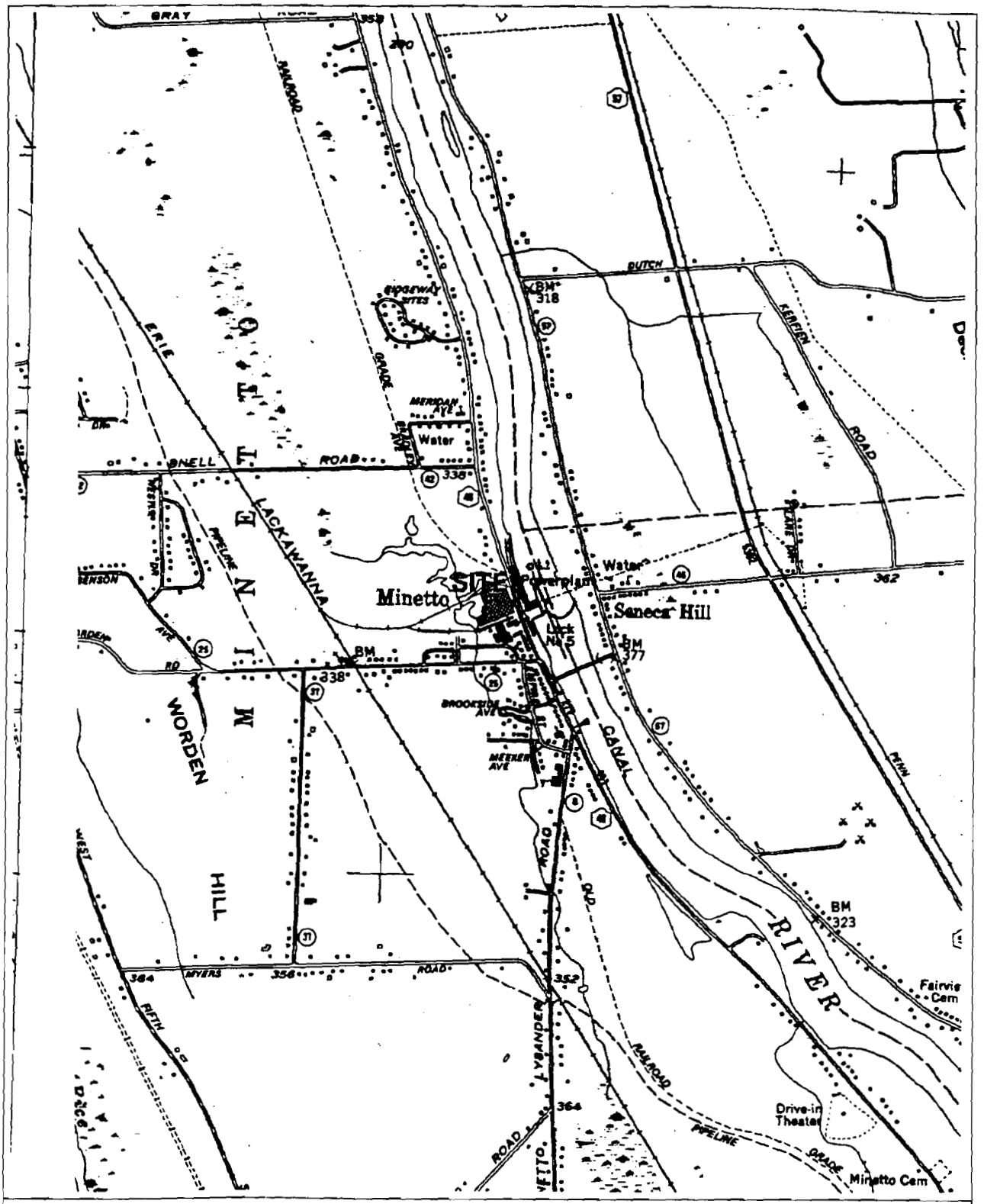
Water
8 gw wells
2 MS/MSD
1 Trip Blank

Soil
1 sediment
1 MS/MSD

Fred: Previous metals results attached for Columbia Mills. JCS.

Fred, Is this possible on such short notice? I asked John Rankin in your absence and he told me that the metals ~~analysis~~ samples would need to be held. Not a problem. Please see me on Thursday.

John Strang
7-0927



Site Location Map

738012 Columbia Mills Company

NYSDOT Planimetric Quadrangle(s):
OSWEGO WEST, OSWEGO EAST

N

0 500 1000 1500 2000
FEET

Scale 1:24,000

MALCOLM PIRNIE

TABLE 2-3

COLUMBIA MILLS LANDFILL
POST-CLOSURE OPERATIONS & MAINTENANCE PLAN

SAMPLE METHODS, PRESERVATIONS, AND HOLDING TIMES

Parameter	SW-846 Method	Preservation[1]		Holding Time
		Solids	Liquids	
TCL Volatiles	8240 (GC/MS)	Cool to 4°C	HCl to pH≤2 Cool to 4°C	14 days
Total Metals	6010A (ICP)	Cool to 4°C	HNO_3 to pH≤2 Cool to 4°C	6 months
Total Cyanide	9010A	Cool to 4°C	NaOH to pH≥12 Cool to 4°C	14 days

NOTE:
(1) Preservations will be added to the sample bottles in the laboratory prior to collection. Ice will be used to cool samples in the field and in transit to the laboratory.

What analyses can DVH do for us.

Sediment Metals are different than the Groundwater Metals.

Need Health & Safety Plan for Tom Kent.

MALCOLM PIRNIE

TABLE 2-1
COLUMBIA MILLS LANDFILL
POST-CLOSURE OPERATIONS & MAINTENANCE PLAN
CONTAMINANT MONITORING PROGRAM

Sample Measurement Type	Monitoring Location	Collection/ Measurement Frequency	Parameters	QC Samples
Groundwater	LF-1S,D LF-2S,D LF-3S,D LF-4S,D	Annually	Target Compound List (TCL) Volatiles Total Metals[1] Cyanide Field Parameters[2]	Matrix Spike Matrix Spike Duplicate[5]
Leachate/Groundwater Discharge	Amphibian Breeding Pond Inlet [3]	Monthly to Quarterly after First Year	Target Compound List (TCL) Volatiles Total Metals[1] Cyanide Field Parameters[2]	—
Sediment	Amphibian Breeding Pond Sediment	Every Five Years	Target Compound List (TCL) Volatiles Total Metals[1] Cyanide	Matrix Spike Matrix Spike Duplicate[5]
Landfill Gas	Gas Vents 1-2	At Year One and Evaluate	Explosive Gas (% LEL) & Percent Oxygen[4]	—
Groundwater Elevation	LF1-S,D LF2-S,D LF3-S,D LF4-S,D Piezometers LFP1-14	Annually	—	—

8 Wells
2 MSD/MS
1 TB
1 Eff
1 Sediment
2 MS/MSD
0
0 just elevations

NOTES:

(1) *Total metals include: aluminum, antimony, arsenic, barium, cadmium, chromium, copper, iron, lead, magnesium, manganese and zinc.*

(2) *Field parameters include: pH, Eh, temperature, turbidity and specific conductivity.*

(3) *If invert of Amphibian Breeding Pond inlet is below pond surface elevation, sample shall be collected from upstream sample manhole. If results exceed effluent criteria permit limits presented in Table 2-4, discrete samples shall be collected from each of the three feed lines to the sample manhole and analyzed for all indicated parameters.*

(4) *Percent lower explosive limit (%LEL) & percent oxygen to be measured with an explosimeter.*

(5) *Matrix Spike Duplicate applies to organics —Duplicate analyses shall be performed for inorganics.*

MALCOLM PIRNIE

TABLE 2-5

COLUMBIA MILLS LANDFILL
POST-CLOSURE OPERATIONS & MAINTENANCE PLAN

SEDIMENT CRITERIA FOR METALS

Metal	Criteria[1] mg/kg (ppm)	Limit of Tolerance[2] mg/kg (ppm)
Antimony	[3]	[3]
Arsenic	5 (4.0-5.5)	33
Cadmium	0.8 (0.6-1.0)	10
Chromium	26 (22-31)	111
Copper	19 (15-25)	114
Iron	24,000 (20,000-30,000)	40,000
Lead	27 (23-31)	250
Manganese	428 (400-457)	1,100
Nickel	22 (15-31)	40
Silver	[3]	[3]
Zinc	85 (65-110)	800

NOTE:

(1) *Source: NYSDEC Sediment Criteria Guidance Document, December 1989. Values in parenthesis are "no-effect" and "lowest-effect" levels, respectively.*

(2) *Source: NYSDEC Sediment Criteria Guidance Document, December 1989. Concentration that would be detrimental to the majority of species, potentially eliminating most.*

(3) *No criteria listed.*

MALCOLM PIRNIE

TABLE 2-4

EFFLUENT CRITERIA OF SURFACE WATER DISCHARGE PERMIT

Effluent	Daily Maximum (mg/L)
Toluene	0.01
Trichloroethane	0.01
Methyl ethyl ketone (MEK)	Monitor
Aluminum, Total	0.1
Antimony, Total	0.8
Barium, Total	0.3
Cadmium, Total	0.014
Chromium, Total	0.5
Copper, Total	0.1
Copper, Dissolved	Monitor
Iron, Total	0.3
Lead, Total	0.33
Manganese, Total	4.0
Zinc, Total	0.4
Cyanide, Total	0.06

TABLE 2-1
COLUMBIA MILLS LANDFILL
POST-CLOSURE OPERATIONS & MAINTENANCE PLAN
CONTAMINANT MONITORING PROGRAM

Sample Measurement Type	Monitoring Location	Collection/ Measurement Frequency	Parameters	QC Samples
Groundwater	LF-1S,D LF-2S,D LF-3S,D LF-4S,D	Annually	Target Compound List (TCL) Volatiles Total Metals[1] Cyanide Field Parameters[2]	Matrix Spike Matrix Spike Duplicate[5]
Leachate/Groundwater Discharge	Amphibian Breeding Pond Inlet [3]	Monthly to Quarterly after First Year	Target Compound List (TCL) Volatiles Total Metals[1] Cyanide Field Parameters[2]	—
Sediment	Amphibian Breeding Pond Sediment	Every Five Years	Target Compound List (TCL) Volatiles Total Metals[1] Cyanide	Matrix Spike Matrix Spike Duplicate[5]
Landfill Gas	Gas Vents 1-2	At Year One and Evaluate	Explosive Gas (% LEL) & Percent Oxygen[4]	—
Groundwater Elevation	LF1-S,D LF2-S,D LF3-S,D LF4-S,D LFP1-15	Annually	—	—

NOTES:

(1) *Total metals include: aluminum, antimony, arsenic, barium, cadmium, chromium, copper, iron, lead, magnesium, manganese and zinc.*

(2) *Field parameters include: pH, Eh, temperature, turbidity and specific conductivity.*

(3) *If invert of Amphibian Breeding Pond inlet is below pond surface elevation, sample shall be collected from upstream sample manhole. If results exceed effluent criteria permit limits presented in Table 2-4, discrete samples shall be collected from each of the three feed lines to the sample manhole and analyzed for all indicated parameters.*

(4) *Percent lower explosive limit (%LEL) & percent oxygen to be measured with an explosimeter.*

(5) *Matrix Spike Duplicate applies to organics —Duplicate analyses shall be performed for inorganics.*

TABLE 2-1
COLUMBIA MILLS LANDFILL
POST-CLOSURE OPERATIONS & MAINTENANCE PLAN
CONTAMINANT MONITORING PROGRAM

Sample Measurement Type	Monitoring Location	Collection/ Measurement Frequency	Parameters	QC Samples
Groundwater	LF-1S,D LF-2S,D LF-3S,D LF-4S,D	Annually	Target Compound List (TCL) Volatiles Total Metals[1] Cyanide Field Parameters[2]	Matrix Spike Matrix Spike Duplicate[5]
Leachate/Groundwater Discharge	Amphibian Breeding Pond Inlet [3]	Monthly to Quarterly after First Year	Target Compound List (TCL) Volatiles Total Metals[1] Cyanide Field Parameters[2]	—
Sediment	Amphibian Breeding Pond Sediment	Every Five Years	Target Compound List (TCL) Volatiles Total Metals[1] Cyanide	Matrix Spike Matrix Spike Duplicate[5]
Landfill Gas	Gas Vents 1-2	At Year One and Evaluate	Explosive Gas (% LEL) & Percent Oxygen[4]	—
Groundwater Elevation	LF1-S,D LF2-S,D LF3-S,D LF4-S,D Piezometers LFP1-14	Annually	—	—

NOTES:

(1) *Total metals include: aluminum, antimony, arsenic, barium, cadmium, chromium, copper, iron, lead, magnesium, manganese and zinc.*

(2) *Field parameters include: pH, Eh, temperature, turbidity and specific conductivity.*

(3) *If invert of Amphibian Breeding Pond inlet is below pond surface elevation, sample shall be collected from upstream sample manhole. If results exceed effluent criteria permit limits presented in Table 2-4, discrete samples shall be collected from each of the three feed lines to the sample manhole and analyzed for all indicated parameters.*

(4) *Percent lower explosive limit (%LEL) & percent oxygen to be measured with an explosimeter.*

(5) *Matrix Spike Duplicate applies to organics —Duplicate analyses shall be performed for inorganics.*

MALCOLM PIRNIE

TABLE 2-2

MONITORING WELL AND PIEZOMETER CONSTRUCTION SUMMARY

Well #	Ground Elev.[1]	Well Dia.	Borehole		Top of Screened Interval			Well/ Piezometer Construction Material	Top of Riser Elev.[1,4]
			Depth [2] (feet)	Elev.[1,3]	Depth[2] (feet)	Elev.[1,3]	Length (feet)		
LF-1S	322.85	2"	15.00	307.85	10.00	312.85	5.00	PVC	324.85
LF-1D	323.14	2"	25.00	298.14	20.00	303.14	5.00	PVC	325.14
LF-2S	333.93	2"	15.00	318.93	10.00	323.93	5.00	PVC	335.93
LF-2D	333.90	2"	25.00	308.90	20.00	313.90	5.00	PVC	335.90
LF-3S	314.02	2"	15.00	299.02	10.00	304.02	5.00	PVC	316.02
LF-3D	313.79	2"	25.00	288.79	20.00	293.79	5.00	PVC	315.79
LF-4S	319.63	2"	15.00	304.63	10.00	309.63	5.00	PVC	321.63
LF-4D	319.26	2"	25.00	294.26	20.00	299.26	5.00	PVC	321.26
LFP-1	336.94	2"	16.00	320.94	9.00	327.94	5.00	PVC	338.94
LFP-2	329.71	2"	14.50	315.21	9.50	320.21	5.00	PVC	331.71
LFP-3	326.94	2"	11.00	315.94	6.00	320.94	5.00	PVC	328.94
LFP-4	325.20	2"	10.00	315.20	5.00	320.20	5.00	PVC	327.20
LFP-5	328.64	2"	18.70	309.94	13.70	314.94	5.00	PVC	330.64
LFP-6	326.57	2"	17.50	309.07	12.50	314.07	5.00	PVC	328.57
LFP-7	324.30	2"	11.00	313.30	6.00	318.30	5.00	PVC	326.30
LFP-8	321.39	2"	12.00	309.39	7.00	314.39	5.00	PVC	323.39
LFP-9		2"	13.50		8.50		5.00	PVC	
LFP-10	321.90								323.90
LFP-11	336.68	2"	20.00	316.68	15.00	321.68	5.00	PVC	338.68
LFP-12		2"	20.00		15.00		5.00	PVC	
LFP-13	317.99	2"	6.00	311.99	1.00	316.99	5.00	PVC	319.99
LFP-14	338.82	2"	26.00	312.82	19.00	319.82	5.00	PVC	340.82

NOTES:

(1) Elevation is in feet; distance above sea level.

(2) Measured from ground surface.

(3) Elevation measured from ground surface.

(4) Elevation estimated based on standard two-foot above grade riser.

- Following collection, the samples must be properly packaged in laboratory precleaned containers, labeled, and shipped to the laboratory in a manner to ensure samples are kept at the appropriate temperature and that the holding times for the analysis can be met.

2.2.1 Groundwater Sampling

Eight groundwater samples will be collected from shallow and deep monitoring wells. Prior to each sampling event, water table measurements from the top of the well riser should be made to determine the general direction of groundwater flow and gradient.

Following the water table measurements and prior to sampling, each monitoring well will be purged of three to five times the volume of standing water in the well and until the specific conductance, temperature, pH, Eh, and turbidity of the groundwater are stabilized. If a well is pumped dry before removing this volume of water, the well can be sampled following sufficient recovery but before 24 hours from the purging end time. However, if possible, the wells should not be pumped dry. Table 2-2 summarizes the monitoring well and piezometer construction details.

Groundwater pumps fitted with dedicated collection tubing or disposable polyethylene bailers will be used to purge the wells. The purge rate and volume of water in the well should be recorded in the field notes. Purge water from monitoring wells known to be contaminated will be collected and stored in the leachate collection tank for proper disposal. Purge water from monitoring wells with minimal contamination can be discharged to the ground in the vicinity of the well.

Each groundwater sample will be collected using a new and unused disposable bailer and transferred to the appropriate containers. VOC samples will be filled in a manner which minimizes turbulence and ensures no head space or air bubbles remain in the sample vial. Any physical characteristics of the groundwater (e.g., color, sheen, odor) observed at the time of sampling will be recorded in the field notes.

Refer to Appendix A.1 for the SOP for groundwater sampling.

2.2.2 Leachate/Groundwater Discharge Sampling

One leachate/groundwater discharge grab sample will be collected at the ABP inlet, unless the pipe invert is below the pond surface elevation, in which case the sample must be collected from the upstream sample manhole. The laboratory precleaned container will be hand-filled or securely clamped to the end of a telescoping aluminum tube that serves as a handle. The sample container will be slowly submerged in the discharge pipe or, if necessary, in the manhole and retrieved with minimal surface disturbance. No air bubbles shall be present in or at the surface of the VOC sample prior to capping.

Refer to Appendix A.2 for the SOP for surface water sampling adapted for leachate/groundwater discharge sampling.

2.2.3 Sediment Sampling

A composite sediment sample will be collected from the ABP. The composite shall be comprised of equal volumes of sediment collected from a minimum of four locations, which will be field-selected to provide a representative indication of the entire pond floor. A stainless steel corer fitted with a cellulose acetate sample sleeve will be used to collect sediment from the pond. At each grab location, the sampler will be slowly driven through the water and approximately two to three inches into the sediment. It is important to keep the disturbance at the sediment/water interface to a minimum. The collection procedure shall be repeated at each grab location until adequate sample volume is obtained. For the VOC sample, an aliquot will be collected from each grab location and transferred to a discrete VOC sample jar for laboratory-compositing under controlled conditions. Equal sediment volumes from each grab location shall then be transferred to a precleaned stainless steel mixing bowl, mixed with a precleaned stainless steel trowel and transferred to the appropriate laboratory-supplied container for analysis of the remaining parameters.

Refer to Appendix A.3 for the SOP for sediment sampling in shallow water.

2.2.4 Landfill Gas Monitoring

Landfill gas measurements in Gas Vents 1 and 2 will be obtained as described below. Prior to sampling, an ambient air measurement for methane will be obtained from within five feet of the vent.

- An airtight seal will be formed over the end of the gas vent through the use of a steel band placed around a "Saranax" bag.
- Tygon tubing will be used to connect the bag to a 12-volt vacuum pump (see Figure 3).
- Prior to sampling, approximately five cubic feet will be withdrawn or five minutes of purging will occur (whichever is shorter) to ensure that a representative sample is collected.
- Following purging, the air stream will be monitored for explosive/ combustible gases through the use of an explosimeter.

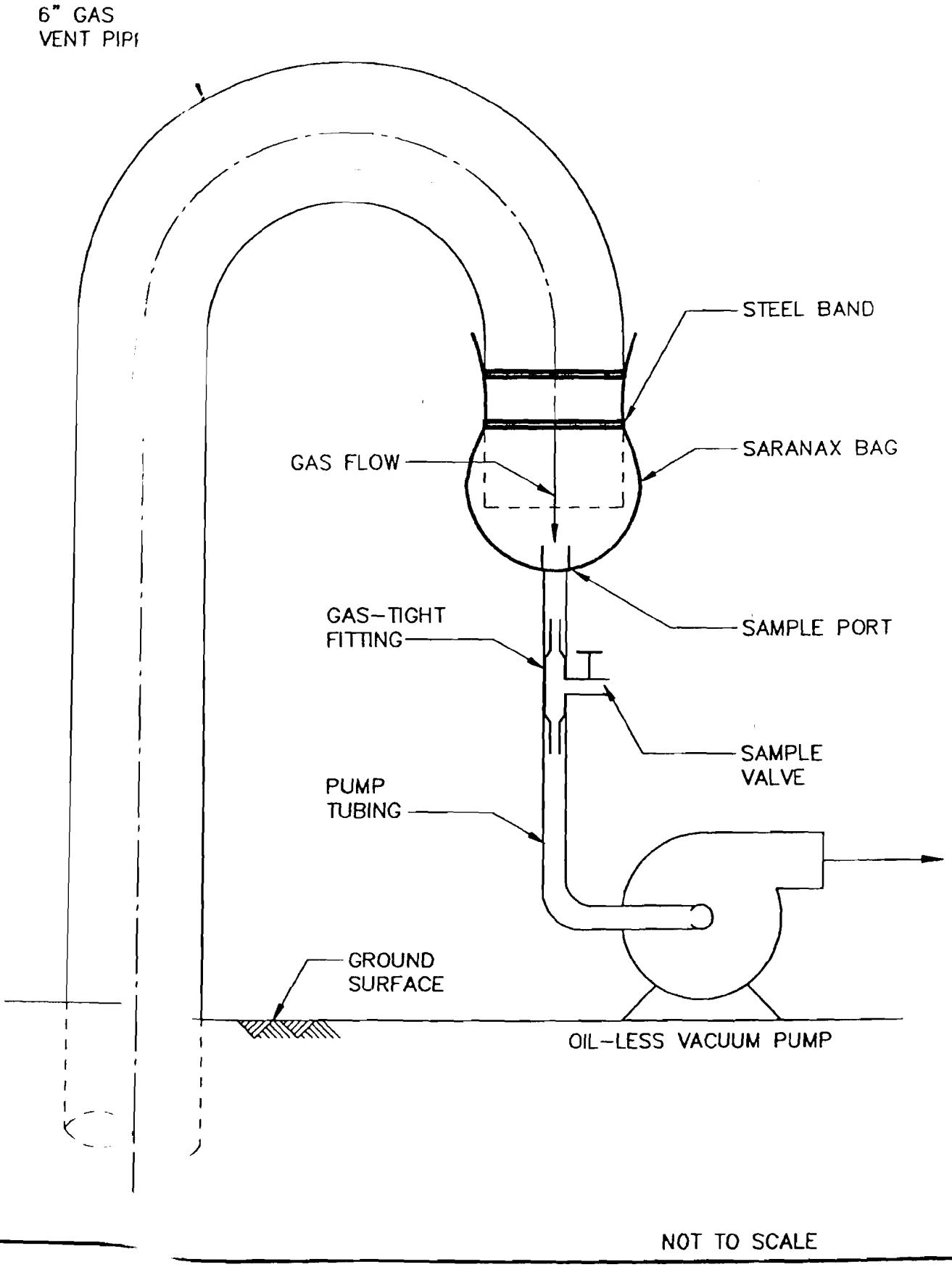
The results will be presented as percent LEL of methane and percent oxygen. The initial measurement will represent the concentration of combustible vapors being released from the gas vents to the open air. Measurements taken after purging will be more indicative of the actual concentration of migrating combustible gas which is in the soil surrounding the gas vents.

Small quantities of methane can occur naturally in the soil as a result of the decomposition of organic matter. Therefore, only monitoring results above 25 percent LEL will be considered significant.

2.3 SAMPLE ANALYTICAL PROGRAM

The following sections outline the parameters each sampling medium will be analyzed for and the methods the laboratory will follow, as well as the required laboratory quality control (QC) samples to be collected. The reporting format of the data, data usability procedures, and the analytical results to be discussed are also presented.

FIGURE 3



NOT TO SCALE

MALCOLM PIRNIE

COLUMBIA MILLS LANDFILL
GAS VENT MONITORING PLAN

SAMPLE COLLECTION METHOD

2.3.1 Analytical Parameters and Methods

The analysis of groundwater, leachate/groundwater discharge, and sediment samples during post-closure monitoring will include TCL volatiles, total metals, and cyanide as shown on Table 2-1. As indicated on Table 2-3, USEPA SW846 methodology will be used for chemical analysis of all samples collected during this monitoring program.

2.3.2 Laboratory QC Samples

To ensure that the sample results are representative of the environment from which they are collected, and that the results meet the needs of the sampling plan, quality control (QC) samples will be collected and analyzed. Quality control protocols have been designed to prevent cross-contamination of samples, document the entire sampling program, and maintain a chain-of-custody procedure for the samples.

The laboratory will prepare trip blanks that will accompany sample bottles into the field and be returned to the lab with the samples collected. One aqueous trip blank for volatile organics will be analyzed each day volatile organics are sampled. As indicated on Table 2-1, samples for matrix spike and matrix spike duplicate (duplicate) analyses will also be collected from one groundwater sample and from the ABP sediment composite. Since the sampling equipment is either dedicated or disposable, no equipment blanks will be prepared.

2.3.3 Reporting and Deliverable Requirements

Analytical data generated by the laboratory will be reported in a format that will allow the review of samples analyzed and evaluation of the usability of the sample data. The analytical report generated by the laboratory will include, for each sample:

- Sample location/sample number
- Date collected
- Date extracted or digested
- Date analyzed
- Analytical methodology (including digestion method used for metals analysis)

MALCOLM PIRNIE Tuesday Sept. 16, 1997 Columbia Mills
11:20 - 12:45

TABLE 2-2

MONITORING WELL AND PIEZOMETER CONSTRUCTION SUMMARY

Well #	Ground Elev.(1)	Well Dia.	Borehole		Top of Screened Interval			Well/ Piezometer Construction Material	Top of Riser Elev.(1,4)
			Depth (2) (feet)	Elev.(1,3)	Depth(2) (feet)	Elev.(1,3)	Length (feet)		
LF-1S	322.85	2"	15.00	307.85	10.00	312.85	5.00	PVC	324.85
LF-1D	323.14	2"	25.00	298.14	20.00	303.14	5.00	PVC	325.14
LF-2S	333.93	2"	15.00	318.93	10.00	323.93	5.00	PVC	335.93
LF-2D	333.90	2"	25.00	308.90	20.00	313.90	5.00	PVC	335.90
LF-3S	314.02	2"	15.00	299.02	10.00	304.02	5.00	PVC	316.02
LF-3D	313.79	2"	25.00	288.79	20.00	293.79	5.00	PVC	315.79
LF-4S	319.63	2"	15.00	304.63	10.00	309.63	5.00	PVC	321.63
LF-4D	319.26	2"	25.00	294.26	20.00	299.26	5.00	PVC	321.26
LFP-1	336.94	2"	16.00	320.94	9.00	327.94	5.00	3210 PVC	338.94
LFP-2	329.71	2"	14.50	315.21	9.50	320.21	5.00	3210 PVC	331.71
LFP-3	326.94	2"	11.00	315.94	6.00	320.94	5.00	PVC	328.94
LFP-4	325.20	2"	10.00	315.20	5.00	320.20	5.00	PVC	327.20
LFP-5	328.64	2"	18.70	309.94	13.70	314.94	5.00	3210 PVC	330.64
LFP-6	326.57	2"	17.50	309.07	12.50	314.07	5.00	3210 PVC	328.57
LFP-7	324.30	2"	11.00	313.30	6.00	318.30	5.00	3210 PVC	326.30
LFP-8	321.39	2"	12.00	309.39	7.00	314.39	5.00	3210 PVC	323.39
LFP-9		2"	13.50		8.50		5.00	3210 PVC	
LFP-10	321.90								323.90
LFP-11	336.68	2"	20.00	316.68	15.00	321.68	5.00	3210 PVC	338.68
LFP-12		2"	20.00		15.00		5.00	3210 PVC	
LFP-13	317.99	2"	6.00	311.99	1.00	316.99	5.00	PVC	319.99
LFP-14	338.82	2"	26.00	312.82	19.00	319.82	5.00	3210 PVC	340.82

NOTES:

(1) *Elevation is in feet; distance above sea level.*
(2) *Measured from ground surface.*
(3) *Elevation measured from ground surface.*
(4) *Elevation estimated based on standard two-foot above grade riser.*

depth to water
19.30
17.01
15.01
15.90
17.43
15.22
16.71
15.02
18.44
15.22
23.98
24.03
7.71
26.71

Bottom 20.80 OK
OK
Bent
Just slightly Bent
OK
Very slightly Bent
Bent
DRY OK
Bottom @ 18.20 OK
OK
Bottom 25.07 OK
Bottom 25.05 Bent
Right in the Ravine OK
Bent

25.05 - 1.02 = 24.03
24.04 - 1.09 = 23.98
20.80 - 1.50 = 19.30

MONITORING WELL LOG

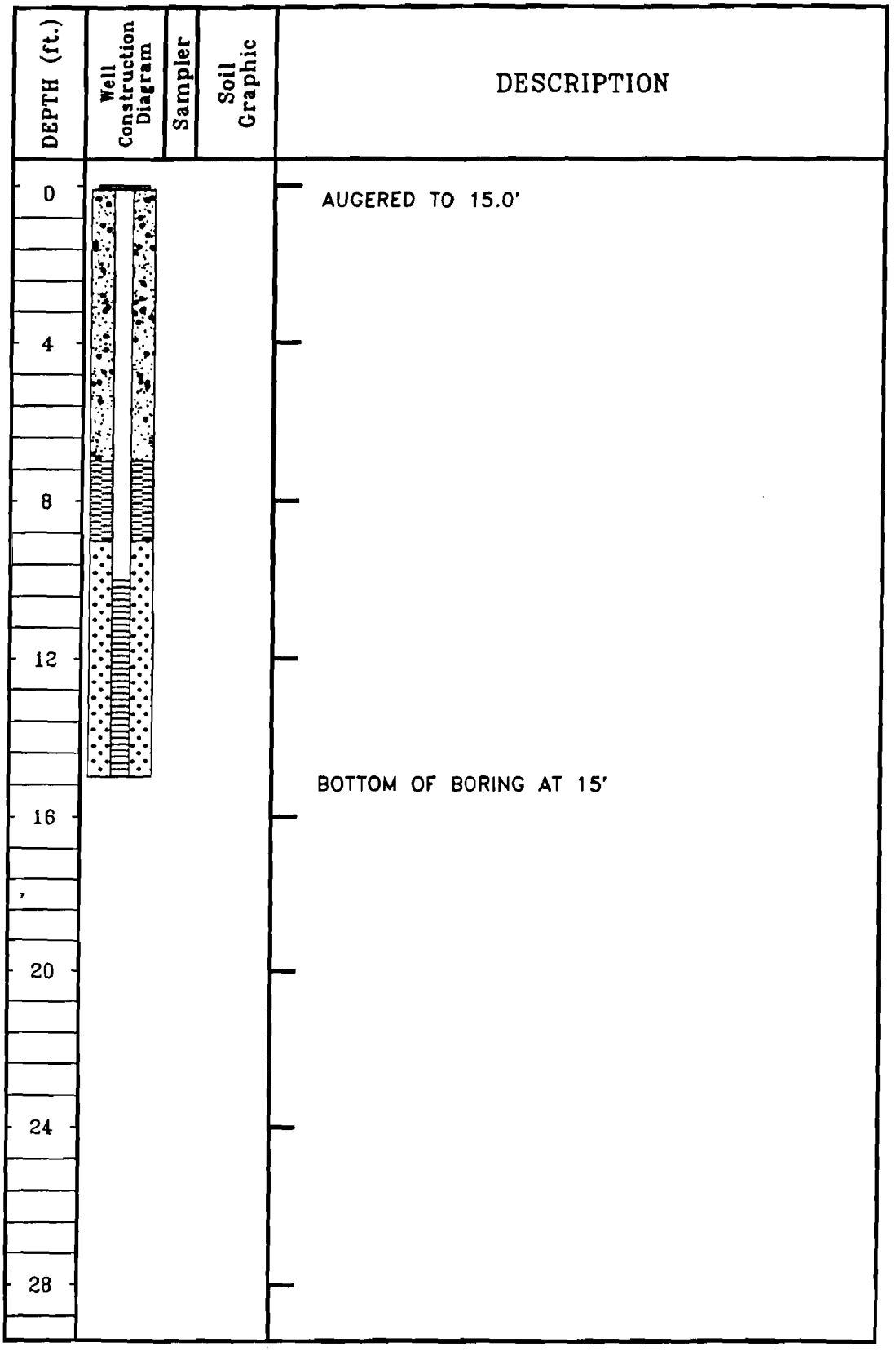
WELL NO. MW-1S

PROJECT: COLUMBIA MILLS LANDFILL CLOSURE — PROJECT NO.: SYR95025

LOCATION: MINETTO, NEW YORK — ELEVATION:

DRILLER: JOE JENSEN — DATE DRILLED: 12/13/95 — DATE COMPLETED: 12/13/95

WATER DEPTH: — INSPECTOR: MALCOLM PIRNIE — COMPLETION DEPTH: 15 feet



PROTECTIVE

COVER TYPE: STEEL

6" X 5' LONG

GROUT:

Type: CEMENT-BENTONITE

Quantity: 2.1 CF

Total Depth: 7.0'

BACKFILL:

Type: SELECT SAND

Top Depth: 9.0'

Bottom Depth: 15.0'

CASING:

Diameter: 2"

Length: 12.5'

Stick Up: 2.5'

SEAL

Type: BENTONITE

Quantity: 1 BUCKET

Top Depth: 7.0'

Bottom Depth: 9.0'

SCREEN

Type: PVC

Diameter: 2"

Slot Size: .010"

Top Depth: 10.0'

Bottom Depth: 15.0'

COMMENTS

VAN DER HORST ENGINEERING

MONITORING WELL LOG

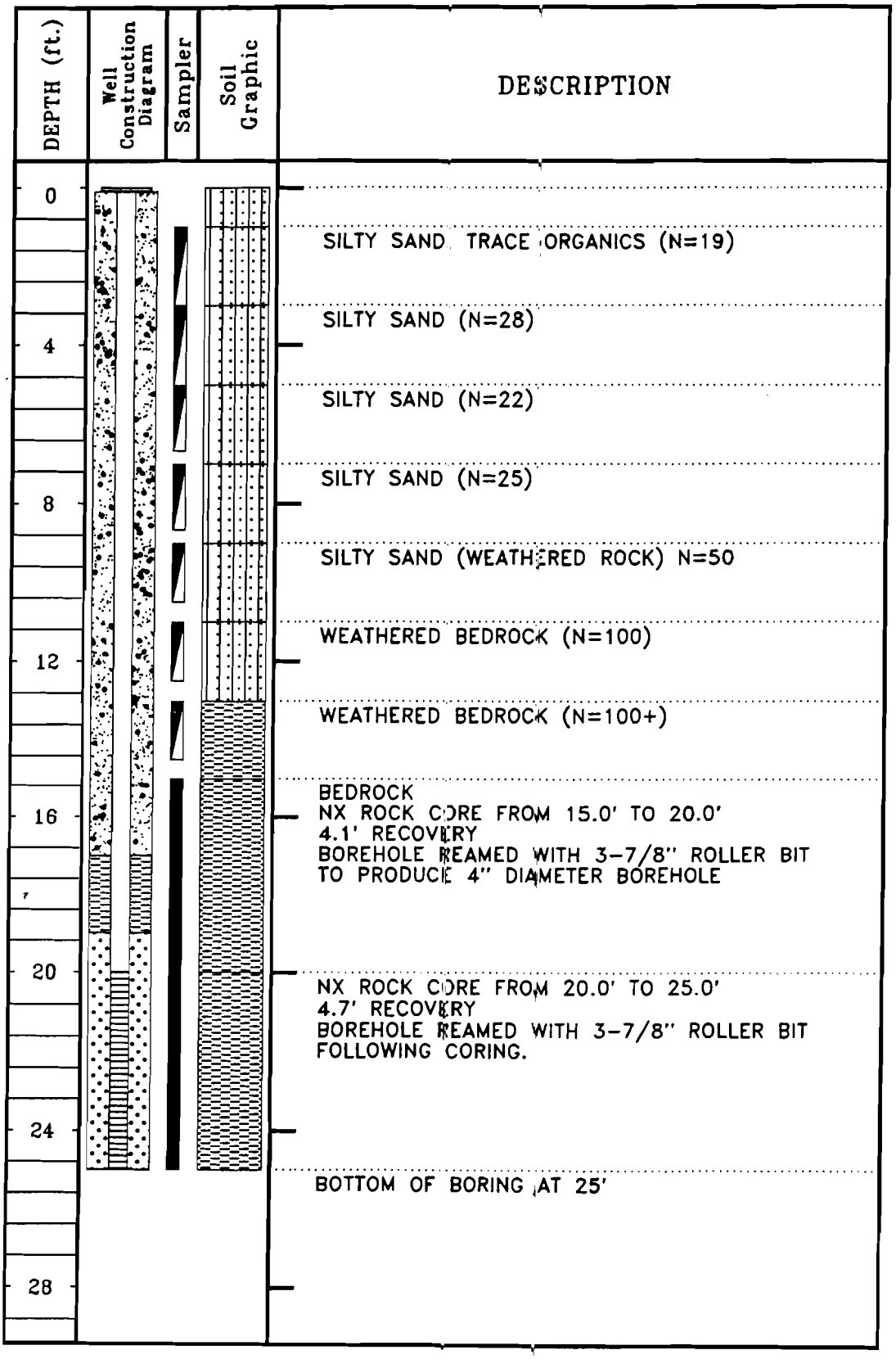
WELL NO. MW-1D

PROJECT: COLUMBIA MILLS LANDFILL CLOSURE — PROJECT NO.: SYR95025

LOCATION: MINETTO, NEW YORK — ELEVATION: _____

DRILLER: JOE JENSEN — DATE DRILLED: 12/12/95 — DATE COMPLETED: 12/12/95

WATER DEPTH: _____ — INSPECTOR: MALCOLM PIRNIE — COMPLETION DEPTH: 25 feet



PROTECTIVE

COVER TYPE: STEEL

6" X 5' LONG

GROUT:

Type: CEMENT-BENTONITE

Quantity: 5.1 C.F.

Total Depth: 17.0'

BACKFILL:

Type: SELECT SAND

Top Depth: 19.0'

Bottom Depth: 25.0'

CASING:

Diameter: 2"

Length: 22.5'

Stick Up: 2.5'

SEAL

Type: BENTONITE

Quantity: 1 BUCKET

Top Depth: 17.0'

Bottom Depth: 19.0'

SCREEN

Type: PVC

Diameter: 2"

Slot Size: .010"

Top Depth: 20.0'

Bottom Depth: 25.0'

COMMENTS

VAN DER HORST ENGINEERING

MONITORING WELL LOG

WELL NO. MW-2S

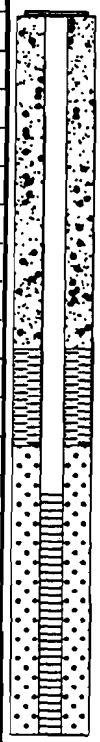
PROJECT: COLUMBIA MILLS LANDFILL CLOSURE — PROJECT NO.: SYR95025

LOCATION: MINETTO, NEW YORK — ELEVATION:

DRILLER: JOE JENSEN — DATE DRILLED: 12/4/95 — DATE COMPLETED: 12/4/95

WATER DEPTH: — INSPECTOR: MALCOLM PIRNIE — COMPLETION DEPTH: 15 feet

DEPTH (ft.)	Well Construction Diagram	Sampler	Soil Graphic	DESCRIPTION
0				AUGERED TO 15.0'
4				
8				
12				
16				BOTTOM OF BORING AT 15'
20				
24				
28				



PROTECTIVE

COVER TYPE: STEEL

6" X 5' LONG

GROUT:

Type: CEMENT-BENTONITE

Quantity: 2.1 CF

Total Depth: 7.0'

BACKFILL:

Type: SELECT SAND

Top Depth: 9.0'

Bottom Depth: 15.0'

CASING:

Diameter: 2"

Length: 12.5'

Stick Up: 2.5'

SEAL

Type: BENTONITE

Quantity: 1 BUCKET

Top Depth: 7.0'

Bottom Depth: 9.0'

SCREEN

Type: PVC

Diameter: 2"

Slot Size: .010"

Top Depth: 10.0'

Bottom Depth: 15.0'

COMMENTS

MONITORING WELL LOG

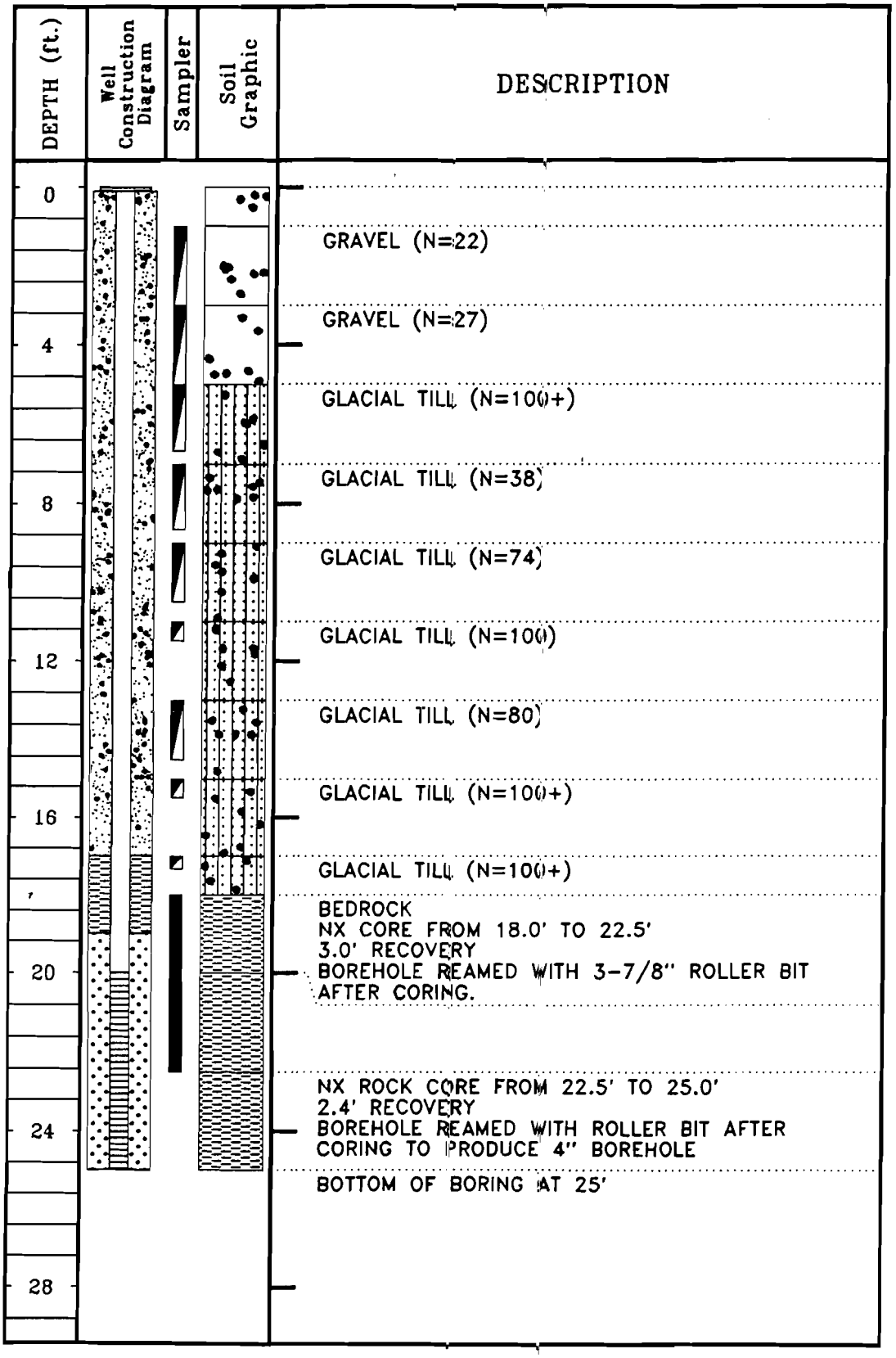
WELL NO. MW-2D

PROJECT: COLUMBIA MILLS LANDFILL CLOSURE — PROJECT NO.: SYR95025

LOCATION: MINETTO, NEW YORK — ELEVATION:

DRILLER: JOE JENSEN — DATE DRILLED: 12/1/95 — DATE COMPLETED: 12/4/95

WATER DEPTH: — INSPECTOR: MALCOLM PIRNIE — COMPLETION DEPTH: 25 feet



PROTECTIVE COVER TYPE: STEEL

6" X 5' LONG

GROUT:

Type: CEMENT-BENTONITE

Quantity: 5.1 C.F.

Total Depth: 17.0'

BACKFILL:

Type: SELECT SAND

Top Depth: 19.0'

Bottom Depth: 25.0'

CASING:

Diameter: 2"

Length: 22.5'

Stick Up: 2.5'

SEAL

Type: BENTONITE

Quantity: 1 BUCKET

Top Depth: 17.0'

Bottom Depth: 19.0'

SCREEN

Type: PVC

Diameter: 2"

Slot Size: .010"

Top Depth: 20.0'

Bottom Depth: 25.0'

COMMENTS

Figure 2

VANDER HORST ENGINEERING

MONITORING WELL LOG

WELL NO. MW-3S

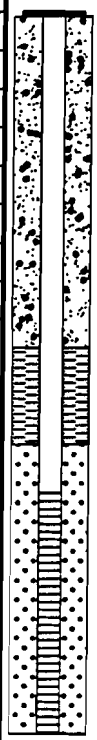
PROJECT: COLUMBIA MILLS LANDFILL CLOSURE — PROJECT NO.: SYR95025

LOCATION: MINETTO, NEW YORK — ELEVATION:

DRILLER: JOE JENSEN — DATE DRILLED: 12/14/95 — DATE COMPLETED: 12/14/95

WATER DEPTH: — INSPECTOR: MALCOLM PIRNIE — COMPLETION DEPTH: 15 feet

DEPTH (ft.)	Well Construction Diagram	Sampler	Soil Graphic	DESCRIPTION
0				AUGERED TO 8.0'
4				
8				3-7/8" ROLLER BIT TO 15'
12				
				BOTTOM OF BORING AT 15'
16				
20				
24				
28				



PROTECTIVE COVER TYPE: STEEL

6" X 5' LONG

GROUT:

Type: CEMENT-BENTONITE

Quantity: 2.1 CF

Total Depth: 7.0'

BACKFILL:

Type: SELECT SAND

Top Depth: 9.0'

Bottom Depth: 15.0'

CASING:

Diameter: 2"

Length: 12.5'

Stick Up: 2.5'

SEAL

Type: BENTONITE

Quantity: 1 BUCKET

Top Depth: 7.0'

Bottom Depth: 9.0'

SCREEN

Type: PVC

Diameter: 2"

Slot Size: .010"

Top Depth: 10.0'

Bottom Depth: 15.0'

COMMENTS

MONITORING WELL LOG

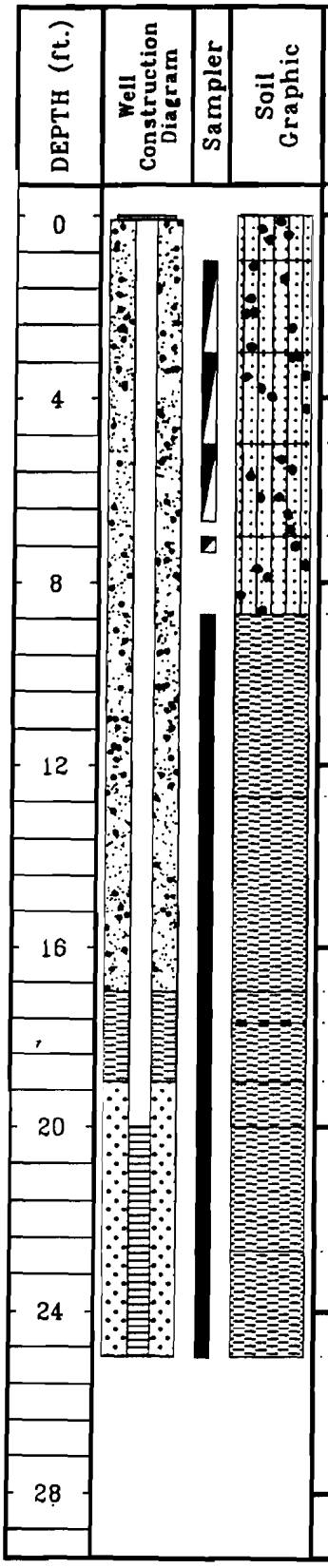
WELL NO. MW-3D

PROJECT: COLUMBIA MILLS LANDFILL CLOSURE — PROJECT NO.: SYR95025

LOCATION: MINETTO, NEW YORK — ELEVATION:

DRILLER: JOE JENSEN — DATE DRILLED: 12/13/95 — DATE COMPLETED: 12/13/95

WATER DEPTH: — INSPECTOR: MALCOLM PIRNIE — COMPLETION DEPTH: 25 feet



DESCRIPTION

SAND AND GRAVEL (N=25)

SAND AND GRAVEL (N=22)

SAND AND GRAVEL (100+)

SAND AND GRAVEL (N=100+)

BEDROCK
NX CORE FROM 8.7' TO 12.7'
BOREHOLE REAMED WITH ROLLER BIT AFTER CORING TO PRODUCE A 4" BOREHOLE

NX CORE FROM 12.7 TO 17.7'
4.9' RECOVERY
BOREHOLE REAMED WITH ROLLERBIT AFTER CORING TO PRODUCE 4" BOREHOLE

NX CORE FROM 17.7' TO 22.7'
4.7' RECOVERY
BOREHOLE REAMED WITH 3-7/8" ROLLER BIT AFTER CORING.

NX ROCK CORE FROM 22.7' TO 25.0'
2.3' RECOVERY
BOREHOLE REAMED WITH ROLLER BIT AFTER CORING TO PRODUCE 4" BOREHOLE

BOTTOM OF BORING AT 25'

PROTECTIVE COVER TYPE: STEEL
6" X 5' LONG

GROUT:
Type: CEMENT-BENTONITE
Quantity: 5.1 CF
Total Depth: 17.0'

BACKFILL:
Type: SELECT SAND
Top Depth: 19.0'
Bottom Depth: 25.0'

CASING:
Diameter: 2"
Length: 22.5'
Stick Up: 2.5'

SEAL
Type: BENTONITE
Quantity: 1 BUCKET
Top Depth: 17.0'
Bottom Depth: 19.0'

SCREEN
Type: PVC
Diameter: 2"
Slot Size: .010"
Top Depth: 20.0'
Bottom Depth: 25.0'

COMMENTS

VAN DER HORST ENGINEERING

MONITORING WELL LOG

WELL NO. MW-4S

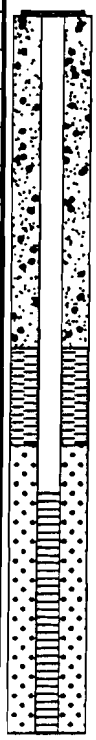
PROJECT: COLUMBIA MILLS LANDFILL CLOSURE — PROJECT NO.: SYR95025

LOCATION: MINETTO, NEW YORK — ELEVATION: _____

DRILLER: JOE JENSEN — DATE DRILLED: 12/14/95 — DATE COMPLETED: 12/14/95

WATER DEPTH: _____ — INSPECTOR: MALCOLM PIRNIE — COMPLETION DEPTH: 15 feet

DEPTH (ft.)	Well Construction Diagram	Sampler	Soil Graphic	DESCRIPTION
0				AUGERED TO 5.0'
4				NX CORE FROM 5.0' TO 15.0', FOLLOWED BY REAMING WITH ROLLER BIT TO PRODUCE 4" HOLE
8				
12				
16				BOTTOM OF BORING AT 15'
20				
24				
28				



PROTECTIVE COVER TYPE: STEEL

6" X 5' LONG

GROUT:

Type: CEMENT-BENTONITE

Quantity: 2.1 CF

Total Depth: 7.0'

BACKFILL:

Type: SELECT SAND

Top Depth: 9.0'

Bottom Depth: 15.0'

CASING:

Diameter: 2"

Length: 12.5'

Stick Up: 2.5'

SEAL

Type: BENTONITE

Quantity: 1 BUCKET

Top Depth: 7.0'

Bottom Depth: 9.0'

SCREEN

Type: PVC

Diameter: 2"

Slot Size: .010"

Top Depth: 10.0'

Bottom Depth: 15.0'

COMMENTS

MONITORING WELL LOG

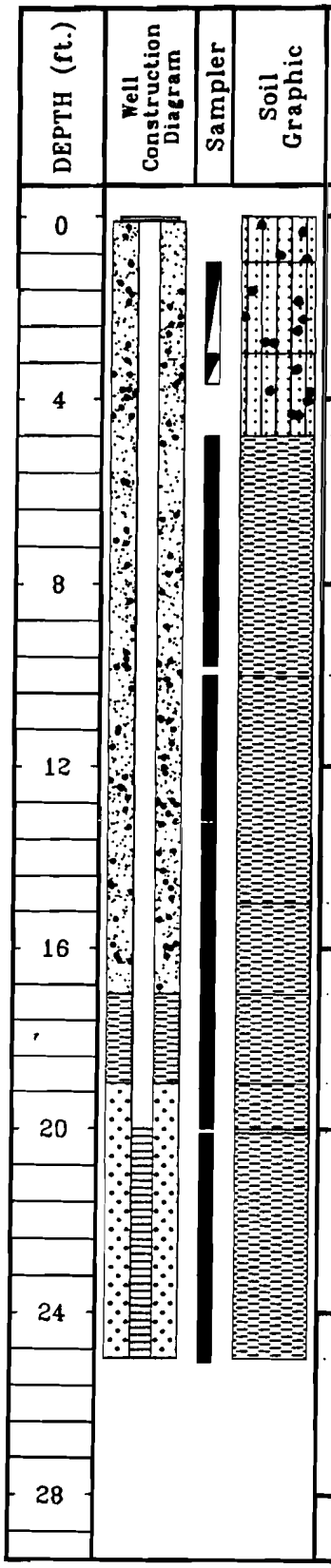
WELL NO. MW-4D

PROJECT: COLUMBIA MILLS LANDFILL CLOSURE — PROJECT NO.: SYR95025

LOCATION: MINETTO, NEW YORK — ELEVATION:

DRILLER: JOE JENSEN — DATE DRILLED: 12/13/95 — DATE COMPLETED: 12/13/95

WATER DEPTH: — INSPECTOR: MALCOLM PIRNIE — COMPLETION DEPTH: 25 feet



DESCRIPTION

SAND AND GRAVEL (N=15)

SAND AND GRAVEL (N=100+)

BEDROCK
NX CORE FROM 4.8' TO 10.0, 58" REC.
BOREHOLE REAMED WITH ROLLER BIT AFTER CORING TO PRODUCE A 4" BOREHOLE

NX CORE FROM 10.0' TO 15.0'
4.9' RECOVERY
BOREHOLE REAMED WITH ROLLERBIT AFTER CORING TO PRODUCE 4" BOREHOLE

NX CORE FROM 15.0' TO 20.0'
5.0' RECOVERY
BOREHOLE REAMED WITH ROLLERBIT TO PRODUCE 4" BOREHOLE

NX ROCK CORE FROM 20.0' TO 25.0'
5.0' RECOVERY
BOREHOLE REAMED WITH ROLLER BIT AFTER CORING TO PRODUCE 4" BOREHOLE

BOTTOM OF BORING AT 25'

PROTECTIVE

COVER TYPE: STEEL

6" X 5' LONG

GROUT:

Type: CEMENT-BENTONITE

Quantity: 5.1 CF

Total Depth: 17.0'

BACKFILL:

Type: SELECT SAND

Top Depth: 19.0'

Bottom Depth: 25.0'

CASING:

Diameter: 2"

Length: 22.5'

Stick Up: 2.5'

SEAL

Type: BENTONITE

Quantity: 1 BUCKET

Top Depth: 17.0'

Bottom Depth: 19.0'

SCREEN

Type: PVC

Diameter: 2"

Slot Size: .010"

Top Depth: 20.0'

Bottom Depth: 25.0'

COMMENTS

Figure 4

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MONITORING WELL LOG

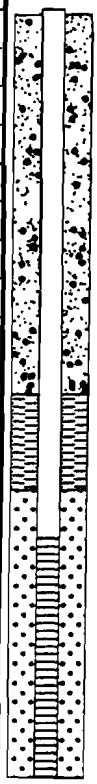
WELL NO. LFP-1

PROJECT: COLUMBIA MILLS LANDFILL CLOSURE — PROJECT NO.: SYR95025

LOCATION: MINETTO, NEW YORK — ELEVATION: _____

DRILLER: JOE JENSEN — DATE DRILLED: 12/6/95 — DATE COMPLETED: 12/6/95

WATER DEPTH: _____ — INSPECTOR: MALCOLM PIRNIE — COMPLETION DEPTH: 16 feet

DEPTH (ft.)	Well Construction Diagram	Sampler	Soil Graphic	DESCRIPTION
0				AUGERED TO 16.0'
4				
8				
12				
16				BOTTOM OF BORING AT 16.0'
20				
24				
28				

PROTECTIVE

COVER TYPE: NONE

GROUT:

Type: CEMENT-BENTONIT

Quantity: 2.4 CF

Total Depth: 8.0'

BACKFILL:

Type: SELECT SAND

Top Depth: 10.0'

Bottom Depth: 16.0'

CASING:

Diameter: 2"

Length: 16.0'

Stick Up: 5.0'

SEAL

Type: BENTONITE

Quantity: 1 BUCKET

Top Depth: 8.0'

Bottom Depth: 10.0'

SCREEN

Type: PVC

Diameter: 2"

Slot Size: .010"

Top Depth: 9.0'

Bottom Depth: 16.0'

COMMENTS

MONITORING WELL LOG

WELL NO. LFP-2

PROJECT: COLUMBIA MILLS LANDFILL CLOSURE — PROJECT NO.: SYR95025

LOCATION: MINETTO, NEW YORK — ELEVATION: _____

DRILLER: JOE JENSEN — DATE DRILLED: 12/7/95 — DATE COMPLETED: 12/7/95

WATER DEPTH: _____ — INSPECTOR: MALCOLM PIRNIE — COMPLETION DEPTH: 14.5 feet

DEPTH (ft.)	Well Construction Diagram	Sampler	Soil Graphic	DESCRIPTION
0				AUGERED TO 7.0'
4				
8				NX ROCK CORE FROM 7.0' TO 9.0' FOLLOWED BY ROLLER BIT REAMING AUGERED FROM 9.0' TO 13.0'
12				ROLLERBIT REAMING FROM 13.0' TO 14.5' BOTTOM OF BORING AT 14.5'
16				
20				
24				
28				

PROTECTIVE COVER TYPE: NONE

GROUT:

Type: CEMENT-BENTONITE

Quantity: 2.0 CF

Total Depth: 6.5'

BACKFILL:

Type: SELECT SAND

Top Depth: 8.5'

Bottom Depth: 14.5'

CASING:

Diameter: 2"

Length: 16.0'

Stick Up: 5.0'

SEAL

Type: BENTONITE

Quantity: 1 BUCKET

Top Depth: 6.5'

Bottom Depth: 8.5'

SCREEN

Type: PVC

Diameter: 2"

Slot Size: .010"

Top Depth: 9.5'

Bottom Depth: 14.5'

COMMENTS

MONITORING WELL LOG

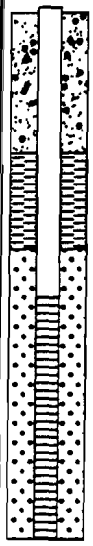
WELL NO. LFP-3

PROJECT: COLUMBIA MILLS LANDFILL CLOSURE — PROJECT NO.: SYR95025

LOCATION: MINETTO, NEW YORK — ELEVATION: _____

DRILLER: JOE JENSEN — DATE DRILLED: 12/7/95 — DATE COMPLETED: 12/7/95

WATER DEPTH: _____ — INSPECTOR: MALCOLM PIRNIE — COMPLETION DEPTH: 11 feet

DEPTH (ft.)	Well Construction Diagram	Sampler	Soil Graphic	DESCRIPTION
0				AUGERED TO 11.0'
4				
8				
12				BOTTOM OF BORING AT 11'
16				
20				
24				
28				

PROTECTIVE

COVER TYPE: NONE

GROUT:

Type: CEMENT-BENTONIT

Quantity: 0.9 CF

Total Depth: 3.0'

BACKFILL:

Type: SELECT SAND

Top Depth: 5.0'

Bottom Depth: 11.0'

CASING:

Diameter: 2"

Length: 16.0'

Stick Up: 5.0'

SEAL

Type: BENTONITE

Quantity: 1 BUCKET

Top Depth: 3.0'

Bottom Depth: 5.0'

SCREEN

Type: PVC

Diameter: 2"

Slot Size: .010"

Top Depth: 6.0'

Bottom Depth: 11.0'

COMMENTS

Figure 13

VAN DER HORST ENGINEERING

MONITORING WELL LOG

WELL NO. LFP-4

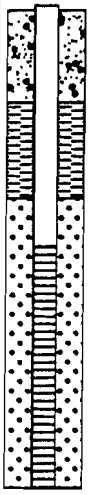
PROJECT: COLUMBIA MILLS LANDFILL CLOSURE — PROJECT NO.: SYR95025

LOCATION: MINETTO, NEW YORK — ELEVATION:

DRILLER: JOE JENSEN — DATE DRILLED: 12/11/95 — DATE COMPLETED: 12/11/95

WATER DEPTH: — INSPECTOR: MALCOLM PIRNIE — COMPLETION DEPTH: 10 feet

DEPTH (ft.)	Well Construction Diagram	Sampler	Soil Graphic	DESCRIPTION
0				AUGERED TO 10.0'
4				
8				
				BOTTOM OF BORING AT 10'
12				
16				
20				
24				
28				



PROTECTIVE COVER TYPE: NONE

GROUT:

Type: CEMENT-BENTONITE

Quantity: 0.6 CF

Total Depth: 2.0'

BACKFILL:

Type: SELECT SAND

Top Depth: 4.0'

Bottom Depth: 10.0'

CASING:

Diameter: 2"

Length: 15.0'

Stick Up: 5.0'

SEAL

Type: BENTONITE

Quantity: 1 BUCKET

Top Depth: 2.0'

Bottom Depth: 4.0'

SCREEN

Type: PVC

Diameter: 2"

Slot Size: .010"

Top Depth: 5.0'

Bottom Depth: 10.0'

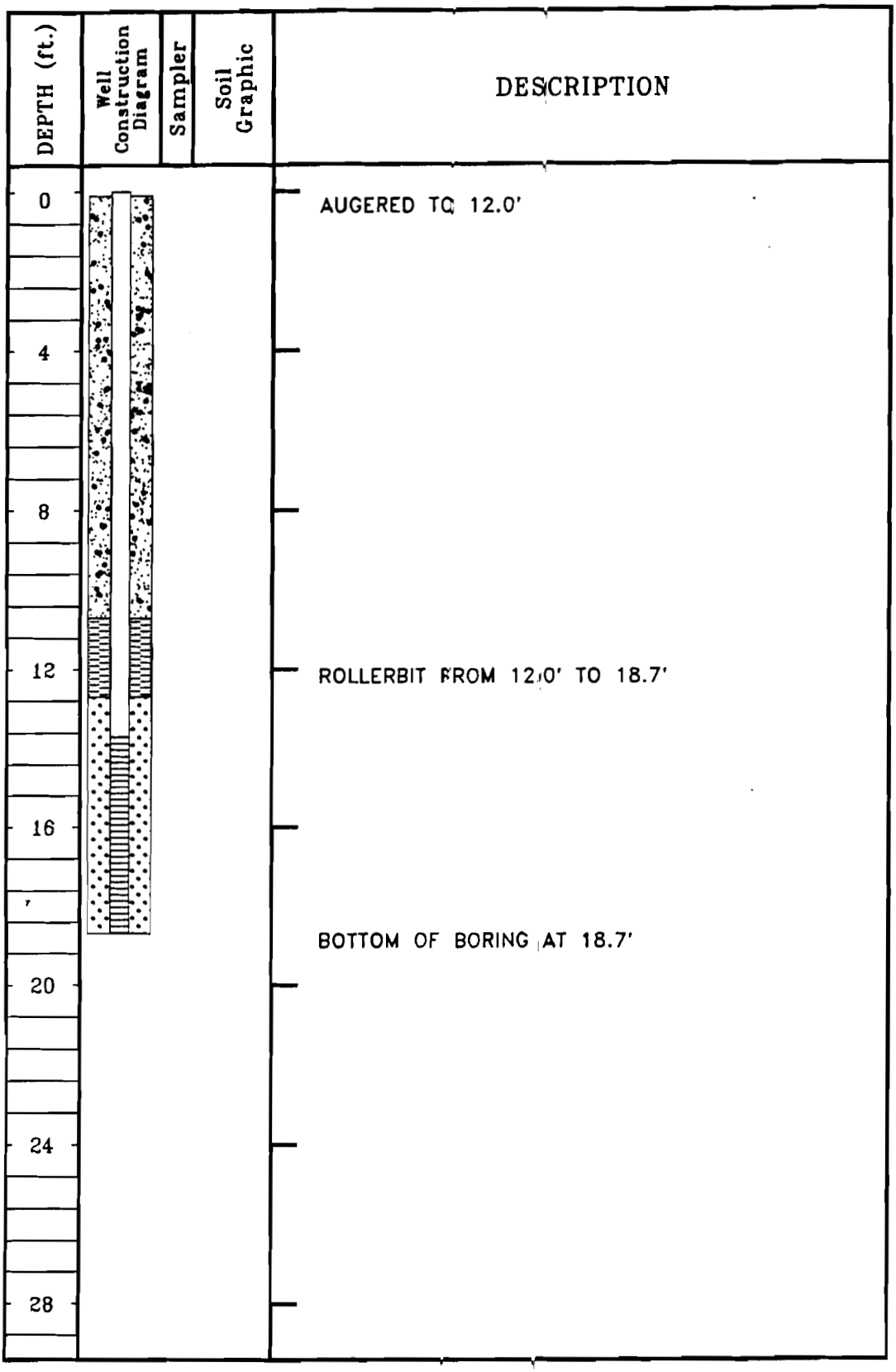
COMMENTS

VAN DER HORST ENGINEERING

MONITORING WELL LOG

WELL NO. LFP-5

PROJECT: COLUMBIA MILLS LANDFILL CLOSURE
PROJECT NO.: SYR95025
LOCATION: MINETTO, NEW YORK
ELEVATION:
DRILLER: JOE JENSEN
DATE DRILLED: 12/5/95
DATE COMPLETED: 12/6/95
WATER DEPTH:
INSPECTOR: MALCOLM PIRNIE
COMPLETION DEPTH: 18.7 feet



PROTECTIVE
COVER TYPE: NONE

GROUT:
Type: CEMENT-BENTONITE
Quantity: 3.2 CF
Total Depth: 10.7'

BACKFILL:
Type: SELECT SAND
Top Depth: 12.7'
Bottom Depth: 18.7'

CASING:
Diameter: 2"
Length: 18.7'
Stick Up: 5.0'

SEAL
Type: BENTONITE
Quantity: 1 BUCKET
Top Depth: 10.7'
Bottom Depth: 12.7'

SCREEN
Type: PVC
Diameter: 2"
Slot Size: .010"
Top Depth: 13.7'
Bottom Depth: 18.7'

COMMENTS

Figure 21

VAN DER HORST ENGINEERING

MONITORING WELL LOG

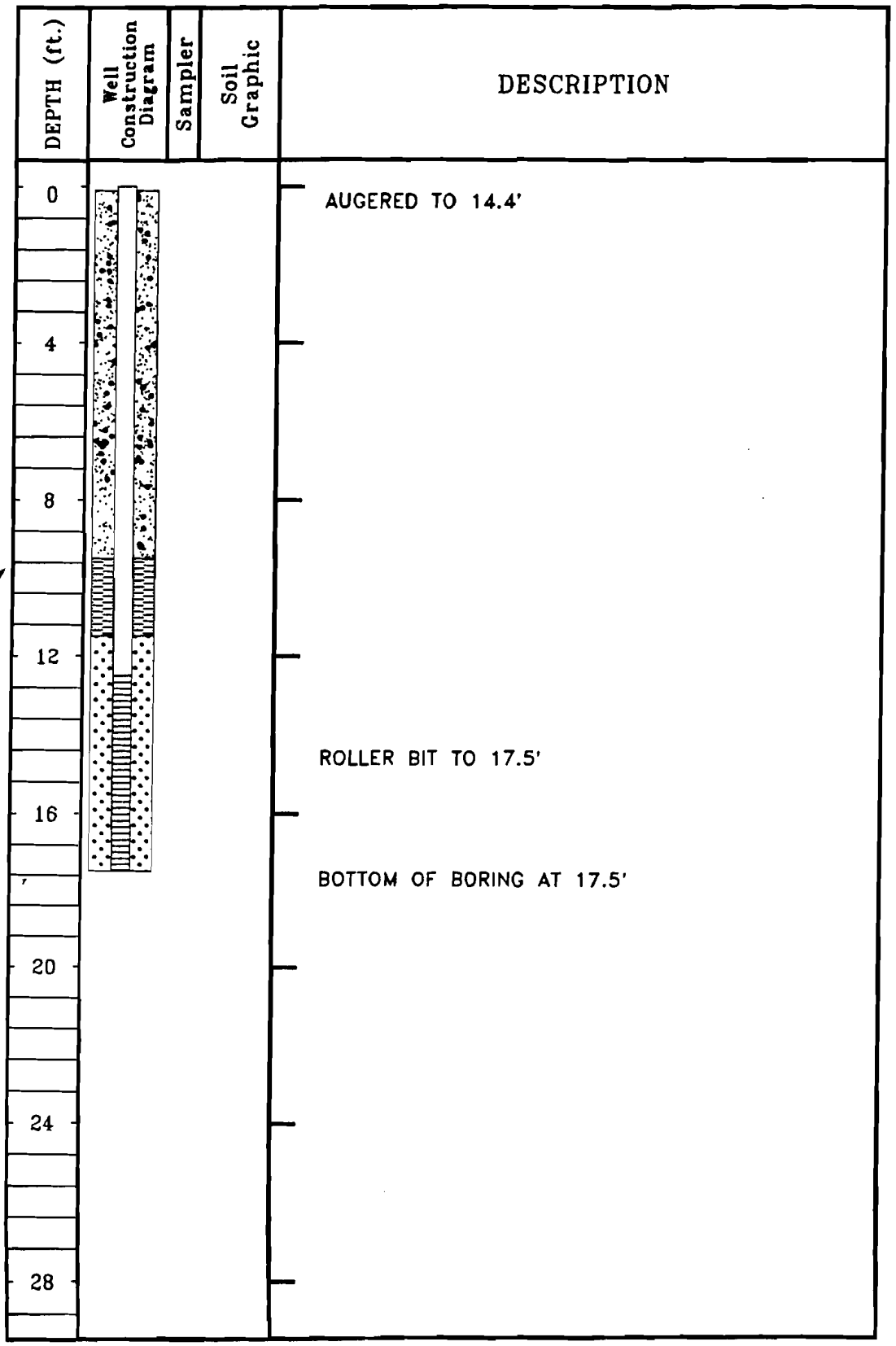
WELL NO. LFP-6

PROJECT: COLUMBIA MILLS LANDFILL CLOSURE — PROJECT NO.: SYR95025

LOCATION: MINETTO, NEW YORK — ELEVATION:

DRILLER: JOE JENSEN — DATE DRILLED: 12/5/95 — DATE COMPLETED: 12/5/95

WATER DEPTH: — INSPECTOR: MALCOLM PIRNIE — COMPLETION DEPTH: 17.5 feet



PROTECTIVE COVER TYPE: NONE

GROUT:

Type: CEMENT-BENTONITE

Quantity: 2.9 CF

Total Depth: 9.5'

BACKFILL:

Type: SELECT SAND

Top Depth: 11.5'

Bottom Depth: 17.5'

CASING:

Diameter: 2"

Length: 17.5'

Stick Up: 5.0'

SEAL

Type: BENTONITE

Quantity: 1 BUCKET

Top Depth: 9.5'

Bottom Depth: 11.5'

SCREEN

Type: PVC

Diameter: 2"

Slot Size: .010"

Top Depth: 12.5'

Bottom Depth: 17.5'

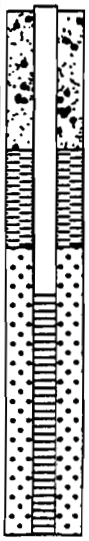
COMMENTS

VAN DER HORST ENGINEERING

MONITORING WELL LOG

WELL NO. LFP-7

PROJECT: COLUMBIA MILLS LANDFILL CLOSURE
PROJECT NO.: SYR95025
LOCATION: MINETTO, NEW YORK
ELEVATION:
DRILLER: JOE JENSEN
DATE DRILLED: 12/7/95
DATE COMPLETED: 12/7/95
WATER DEPTH:
INSPECTOR: MALCOLM PIRNIE
COMPLETION DEPTH: 11 feet

DEPTH (ft.)	Well Construction Diagram	Sampler	Soil Graphic	DESCRIPTION
0				AUGERED TO 11.0'
4				
8				
12				BOTTOM OF BORING AT 11'
16				
20				
24				
28				

PROTECTIVE
COVER TYPE: NONE

GROUT:
Type: CEMENT-BENTONITE
Quantity: 0.9 CF
Total Depth: 3.0'

BACKFILL:
Type: SELECT SAND
Top Depth: 5.0'
Bottom Depth: 11.0'

CASING:
Diameter: 2"
Length: 16.0'
Stick Up: 5.0'

SEAL
Type: BENTONITE
Quantity: 1 BUCKET
Top Depth: 3.0'
Bottom Depth: 5.0'

SCREEN
Type: PVC
Diameter: 2"
Slot Size: .010"
Top Depth: 6.0'
Bottom Depth: 11.0'

COMMENTS

Figure 15

MONITORING WELL LOG

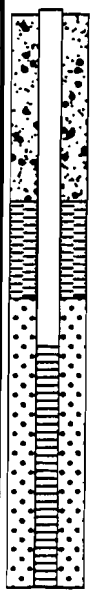
WELL NO. LFP-8

PROJECT: COLUMBIA MILLS LANDFILL CLOSURE — PROJECT NO.: SYR95025

LOCATION: MINETTO, NEW YORK — ELEVATION: _____

DRILLER: JOE JENSEN — DATE DRILLED: 12/7/95 — DATE COMPLETED: 12/7/95

WATER DEPTH: _____ — INSPECTOR: MALCOLM PIRNIE — COMPLETION DEPTH: 12 feet

DEPTH (ft.)	Well Construction Diagram	Sampler	Soil Graphic	DESCRIPTION
0				AUGERED TO 12.0'
4				
8				
12				BOTTOM OF BORING AT 12'
16				
20				
24				
28				

PROTECTIVE COVER TYPE: NONE

GROUT:

Type: CEMENT-BENTONITE

Quantity: 1.2 CF

Total Depth: 4.0'

BACKFILL:

Type: SELECT SAND

Top Depth: 6.0'

Bottom Depth: 12.0'

CASING:

Diameter: 2"

Length: 15.0'

Stick Up: 3.0'

SEAL

Type: BENTONITE

Quantity: 1 BUCKET

Top Depth: 4.0'

Bottom Depth: 6.0'

SCREEN

Type: PVC

Diameter: 2"

Slot Size: .010"

Top Depth: 7.0'

Bottom Depth: 12.0'

COMMENTS

MONITORING WELL LOG

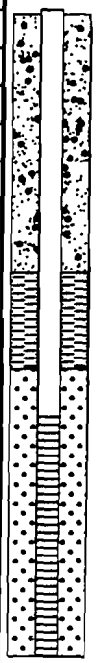
WELL NO. LFP-9

PROJECT: COLUMBIA MILLS LANDFILL CLOSURE — PROJECT NO.: SYR95025

LOCATION: MINETTO, NEW YORK — ELEVATION: _____

DRILLER: JOE JENSEN — DATE DRILLED: 12/7/95 — DATE COMPLETED: 12/7/95

WATER DEPTH: _____ — INSPECTOR: MALCOLM PIRNIE — COMPLETION DEPTH: 13.5 feet

DEPTH (ft.)	Well Construction Diagram	Sampler	Soil Graphic	DESCRIPTION
0				AUGERED TO 13.5'
4				
8				
12				BOTTOM OF BORING AT 13.5'
16				
20				
24				
28				

PROTECTIVE

COVER TYPE: NONE

GROUT:

Type: CEMENT-BENTONIT

Quantity: 1.7 CF

Total Depth: 5.5'

BACKFILL:

Type: SELECT SAND

Top Depth: 7.5'

Bottom Depth: 13.5'

CASING:

Diameter: 2"

Length: 13.5'

Stick Up: 5.0'

SEAL

Type: BENTONITE

Quantity: 1 BUCKET

Top Depth: 5.5'

Bottom Depth: 7.5'

SCREEN

Type: PVC

Diameter: 2"

Slot Size: .010"

Top Depth: 8.5'

Bottom Depth: 13.5'

COMMENTS

MONITORING WELL LOG

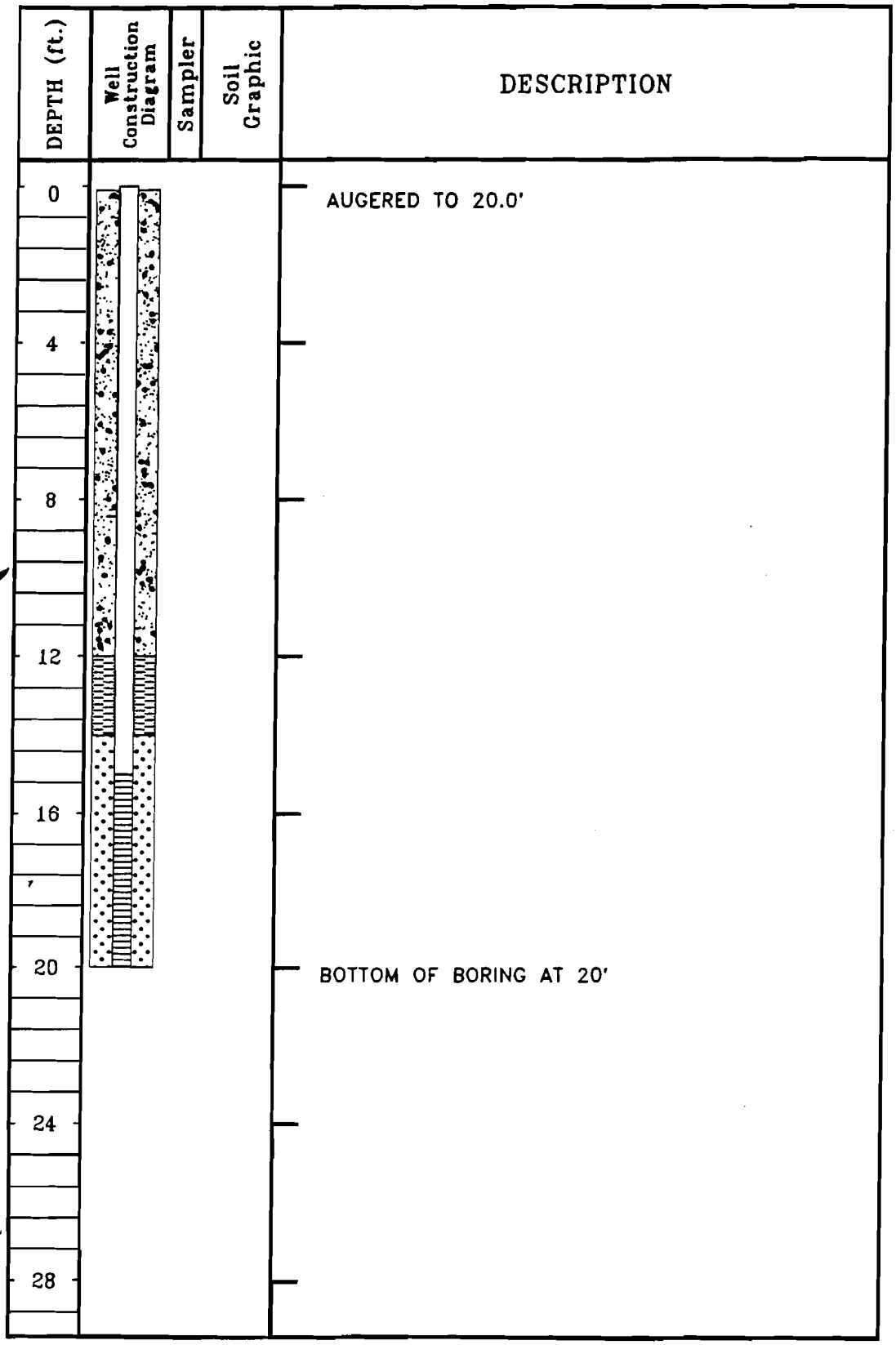
WELL NO. LFP-11

PROJECT: COLUMBIA MILLS LANDFILL CLOSURE — PROJECT NO.: SYR95025

LOCATION: MINETTO, NEW YORK — ELEVATION: _____

DRILLER: JOE JENSEN — DATE DRILLED: 12/6/95 — DATE COMPLETED: 12/6/95

WATER DEPTH: _____ — INSPECTOR: MALCOLM PIRNIE — COMPLETION DEPTH: 20 feet



PROTECTIVE COVER TYPE: NONE

GROUT:

Type: CEMENT-BENTONITE

Quantity: 3.6 CF

Total Depth: 12.0'

BACKFILL:

Type: SELECT SAND

Top Depth: 14.0'

Bottom Depth: 20.0'

CASING:

Diameter: 2"

Length: 20.0'

Stick Up: 5.0'

SEAL

Type: BENTONITE

Quantity: 1 BUCKET

Top Depth: 12.0'

Bottom Depth: 14.0'

SCREEN

Type: PVC

Diameter: 2"

Slot Size: .010"

Top Depth: 15.0'

Bottom Depth: 20.0'

COMMENTS

VAN DER HORST ENGINEERING

MONITORING WELL LOG

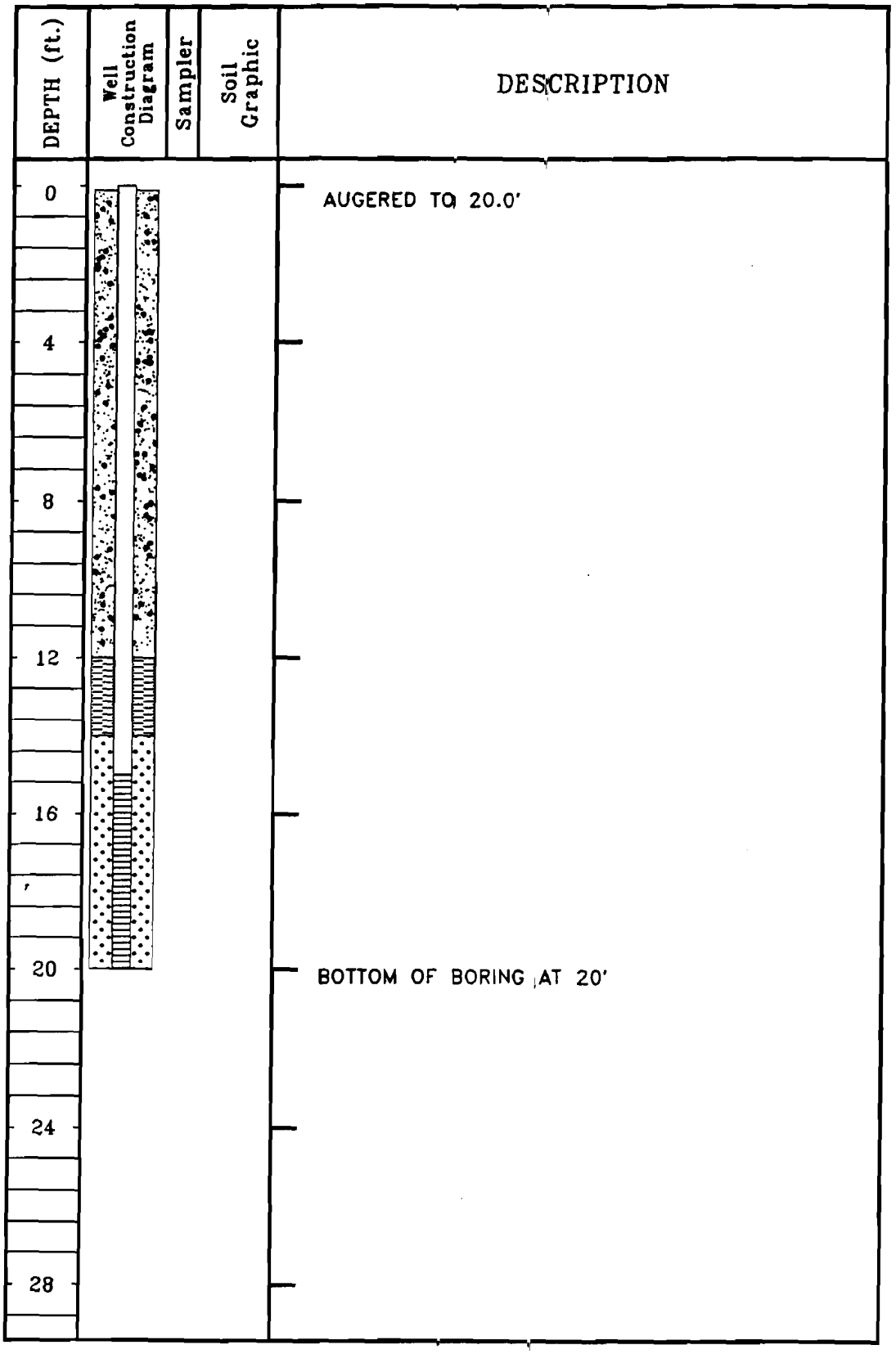
WELL NO. LFP-12

PROJECT: COLUMBIA MILLS LANDFILL CLOSURE — PROJECT NO.: SYR95025

LOCATION: MINETTO, NEW YORK — ELEVATION: _____

DRILLER: JOE JENSEN — DATE DRILLED: 12/6/95 — DATE COMPLETED: 12/6/95

WATER DEPTH: _____ — INSPECTOR: MALCOLM PIRNIE — COMPLETION DEPTH: 20 feet



PROTECTIVE COVER TYPE: NONE

GROUT:
- Type: CEMENT-BENTONITE
- Quantity: 3.6 CF
- Total Depth: 12.0'

BACKFILL:
- Type: SELECT SAND
- Top Depth: 14.0'
- Bottom Depth: 20.0'

CASING:
- Diameter: 2"
- Length: 20.0'
- Stick Up: 5.0'

SEAL
- Type: BENTONITE
- Quantity: 1 BUCKET
- Top Depth: 12.0'
- Bottom Depth: 14.0'

SCREEN
- Type: PVC
- Diameter: 2"
- Slot Size: .010"
- Top Depth: 15.0'
- Bottom Depth: 20.0'

COMMENTS

VAN DER HORST ENGINEERING

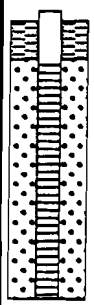
MONITORING WELL LOG
WELL NO. LFP-13

PROJECT: COLUMBIA MILLS LANDFILL CLOSURE — PROJECT NO.: SYR95025

LOCATION: MINETTO, NEW YORK — ELEVATION: _____

DRILLER: JOE JENSEN — DATE DRILLED: 12/11/95 — DATE COMPLETED: 12/11/95

WATER DEPTH: _____ — INSPECTOR: MALCOLM PIRNIE — COMPLETION DEPTH: 6 feet

DEPTH (ft.)	Well Construction Diagram	Sampler	Soil Graphic	DESCRIPTION
0				AUGERED TO 6.0'
4				BOTTOM OF BORING AT 6'
8				
12				
16				
20				
24				
28				

PROTECTIVE
COVER TYPE: NONE

GROUT:
Type: NONE
Quantity: _____
Total Depth: _____

BACKFILL:
Type: SELECT SAND
Top Depth: 1.0'
Bottom Depth: 6.0'

CASING:
Diameter: 2"
Length: 11.0'
Stick Up: 5.0'

SEAL
Type: BENTONITE
Quantity: 1 BUCKET
Top Depth: 0.0'
Bottom Depth: 1.0'

SCREEN
Type: PVC
Diameter: 2"
Slot Size: .010"
Top Depth: 1.0'
Bottom Depth: 6.0'

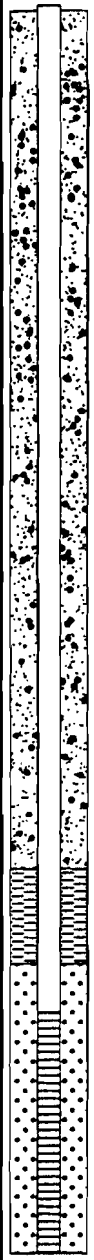
COMMENTS

MONITORING WELL LOG

WELL NO. LFP-14

PROJECT: COLUMBIA MILLS LANDFILL CLOSURE
PROJECT NO.: SYR95025
LOCATION: MINETTO, NEW YORK
ELEVATION:
DRILLER: JOE JENSEN
DATE DRILLED: 12/6/95
DATE COMPLETED: 12/6/95
WATER DEPTH:
INSPECTOR: MALCOLM PIRNIE
COMPLETION DEPTH: 26 feet

DEPTH (ft.)	Well Construction Diagram	Sampler	Soil Graphic	DESCRIPTION
0				AUGERED TO 26.0'
4				
8				
12				
16				
20				
24				BOTTOM OF BORING AT 26.0'
28				



PROTECTIVE COVER TYPE: NONE

GROUT:
Type: CEMENT-BENTONITE
Quantity: 5.4 CF
Total Depth: 18.0'

BACKFILL:
Type: SELECT SAND
Top Depth: 18.0'
Bottom Depth: 26.0'

CASING:
Diameter: 2"
Length: 26.0'
Stick Up: 5.0'

SEAL
Type: BENTONITE
Quantity: 1 BUCKET
Top Depth: 18.0'
Bottom Depth: 20.0'

SCREEN
Type: PVC
Diameter: 2"
Slot Size: .010"
Top Depth: 19.0'
Bottom Depth: 26.0'

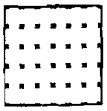
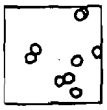
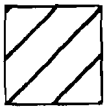
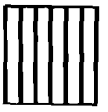
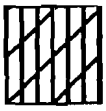
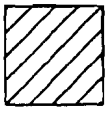
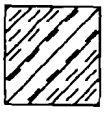
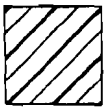
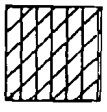
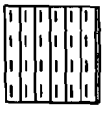
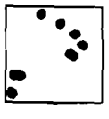
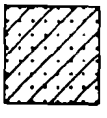
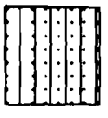
COMMENTS

MALCOLM PIRNIE

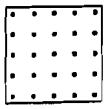
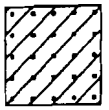
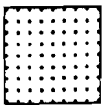
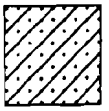
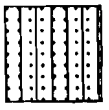
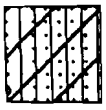
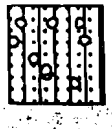
APPENDIX C

MONITORING WELL AND PIEZOMETER LOGS

KEY TO SYMBOLS

Symbol	Description	Symbol	Description
	Intrusive (V)		Poorly graded gravel with silt (GP-GM : NGZ3)
	Weathered (W)		Well graded gravel (GW : 83)
	Frac rock (X)		Well graded gravel with clay (GW-GC : 83O)
	Fine gravel (Y)		Well graded gravel with silt (GW-GM : 83Z)
	High plasticity clay (CH : C)		Elastic silt (MH : M)
	Inorganic silts and clays (CH-MH : MC)		Silt (ML : Z)
	Low plasticity clay (CL : O)		Organic clays (OC : RO)
	Low-high plasticity clays (CL-CH : CO)		High plasticity organic clays (OH : 5)
	Silty low plasticity clay (CL-ML : OZ)		Low plasticity organic silts (OL : 4)
	Clayey gravel (GC : O8)		Organic silts (OM : Z=)
	Silty gravel (GM : Z8)		Peat (PT : Q)
	Poorly graded gravel (GP : G)		Clayey sand (SC : NO)
	Poorly graded gravel with clay (GP-GC : NGO3)		Silty sand (SM : NZ)

KEY TO SYMBOLS

Symbol	Description
	Poorly graded silty fine sand (SM-ML : 1Z)
	Poorly graded sand (SP : S)
	Poorly graded sand with clay (SP-SC : SO)
	Poorly graded sand with silt (SP-SM : SZ)
	Well graded sand (SW : D)
	Well graded sand with clay (SW-SC : DO)
	Well graded sand with silt (SW-SM : DZ)
	Variable mixed sand, gravel, cobbles, silts and clays (VA : DZCBG)
	Silty sandy clay (VC : NCZ)
	Variable gravel and silty sand mix (VG : DZG)
	Variable sand and silt mix (VS : DZY)

Misc. Symbols

Symbol	Description
↑	Drill rejection (BOTTOM)

Symbol	Description
	Boring continues (CONTINUE)
	Water table at date indicated (LWATER)

Soil Samplers

Symbol	Description
	Auger (A)
	Bulk sample taken from 6 in. auger (B)
	California sampler (C)
	Dutch cone test (D)
	Corps of Engineers sampler (E)
	Piston (I)
	Standard penetration test (P)
	Rock core (R)
	Undisturbed thin wall Shelby tube (S)
	No recovery (X)

KEY TO SYMBOLS

Symbol	Description
Monitor Well Details	
	flush-mount cover (COVER)
	riser with cover and protective casing (CASED RISER)
	pipe riser (RISER)
	covered riser (COVERED RISER)
	recessed cover set in concrete (RECESSED)
	protective casing set in concrete (CASED)
	concrete seal (CONCRETE)
	gravel backfill (GRAVEL)
	pipe set in cement grout w/ protective casing (CEMENT CASED)
	assorted cuttings (CUTTINGS)
	bentonite slurry (BENTONITE)
	bentonite pellets (PELLETS)

Symbol	Description
	silica sand, blank PVC (SAND)
	slotted pipe w/ sand (SLOTTED)
	no pipe, filler material (END)
	no pipe, sealed (SEALED)
	silica sand, no pipe (end plug) (SAND PLUG)
	end of well installation (BLANK)

New York State Department of Environmental Conservation
Division of Hazardous Waste Remediation
Bureau of Hazardous Site Control

738012

ADDITIONS/CHANGES TO REGISTRY: SUMMARY OF APPROVALS

SITE NAME: Columbia Mills   DEC I.D. NUMBER 738012

Current Classification 2

Activity: ☐ Add as Class ___   ☑ Reclassify to 4   ☐ Delist Category ___   ☐ Modify ___

Approvals:

Regional Hazardous Waste Engineer	Yes	☐	No	☐	
BEEI of NYSDOH	Yes	☐	No	☐	
DEE	Yes	☐	No	☐	
________ Remediation Action Bureau Director [Class 2]	Yes	☐	No	☐	
BHSC: a. Investigation Section	Yes	☐	No	☐	
b. O&M Section [Class 4]	Yes	☑	No	☐	

ROD RECLASSIFICATION

c. Site Control Section ______________ Date ________

d. Director [signature] for [signature] Date 5/22/97

Completion Checklist

		Completed By: Initials	Date
OWNER NOTIFICATION LETTER?	☑		6/16/97
ADJACENT PROPERTY OWNER NOTIFICATION LETTER?	☑		7/2/97
ENB/LEGAL NOTICE SENT? (For Deletion Only)	☐		
COMMENTS SUMMARIZED/PLACE IN REPOSITORY	☐		
FINAL NOTIFICATION SENT TO OWNER? (For Deletion Only)			

(For proposed Class 2a sites only) Planned investigative activities & dates: ______________

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS WASTE REMEDIATION

8/23/94

SITE INVESTIGATION INFORMATION

1. SITE NAME	2. SITE NUMBER	3. TOWN/CITY/VILLAGE	4. COUNTY
Columbia Mills	7-38-012	Town of Minetto	Oswego

5. REGION	6. CLASSIFICATION		
7	CURRENT 2	PROPOSED 4	MODIFY . Boundaries

7. LOCATION OF SITE (Attach U.S.G.S. Topographic Map showing site location)

a. Quadrangle Oswego

b. Site Latitude 43° 24' 2" Site Longitude 76° 28' 34"

c. Tax Map Numbers 183.00 Section 02 Parcel No. 03.100

d. Site Street Address Route 48 in Minetto

8. BRIEFLY DESCRIBE THE SITE (Attach site plan showing disposal/sampling locations)

This is the former site of a coated cloth and vinyl products manufacturer. The plant operated from 1887 until 1976. The on-site disposal of wastes reportedly occurred throughout the plant's active period.

a. Area 11 acres b. EPA ID Number NYD000285478

c. Completed (X)Phase I (X)Phase II ( ) PSA (X)RI/FS ( )PA/SI (X)Other Remedial Action

9. Hazardous Waste Disposed (Include EPA Hazardous Waste Numbers)

Lead and chromium (D008 and D007), PCBs
various VOC's and semi VOC's

10. ANALYTICAL DATA AVAILABLE

a. ( )Air (X)Groundwater (X)Surface Water (X)Sediment (X)Soil ( )Waste ( )Leachate ( )EPTox ( )TCLP
b. Contravention of Standards or Guidance Values

etals, VOC's and semi VOC's in soils, groundwater and surface water(s); Metals in sediments

11. CONCLUSION

All work required in ROD is complete. A long-term operation and maintenance plan is being developed and implemented. Periodic sampling of the groundwater monitoring wells and leachate discharge for baseline and routine groundwater parameters is included in the O&M for the site. Site boundaries are being modified to encompass only the remediated landfill, other areas are being excluded.

12. SITE IMPACT DATA

a. Nearest Surface Water: Distance on-site	Direction N/A		Classification D		
b. Nearest Groundwater: Depth 5 ft.	Flow Direction north		( )Sole Source ( )Primary ( )Principal		
c. Nearest Water Supply: Distance 1500 ft.	Direction south		Active (X)Yes ( )No		
d. Nearest Building: Distance 1000 ft.	Direction south		Use residential		
e. In State Economic Development Zone?	( )Y	(X)N	i. Controlled Site Access? Partial	(X)Y	( )N
f. Crops or livestock on site?	( )Y	(X)N	j. Exposed hazardous waste?	( )Y	(X)N
g. Documented fish or wildlife mortality?	( )Y	(X)N	k. HRS Score below listing for NPL, <28.5		
h. Impact on special status fish or wildlife resource?	( )Y	(X)N	l. For Class 2: Priority Category 1		

13. SITE OWNER'S NAME	14. ADDRESS	15. TELEPHONE NUMBER
Town of Minetto and Oswego County	Minetto, New York 13115	unknown

16. PREPARER	17. APPROVED
Signature Date	Signature Date
Name, Title, Organization Project Manager, DER, BCS	Earl H. Barcomb, Director, RHSC, DEP Name, Title, Organization

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS WASTE REMEDIATION

8/23/94

SITE INVESTIGATION INFORMATION

1. SITE NAME	2. SITE NUMBER	3. TOWN/CITY/VILLAGE	4. COUNTY
Columbia Mills	7-38-012	Town of Minetto	Oswego

5. REGION	6. CLASSIFICATION		
7	CURRENT 2	PROPOSED 4	MODIFY Boundaries

7. LOCATION OF SITE (Attach U.S.G.S. Topographic Map showing site location)

a. Quadrangle Oswego

b. Site Latitude 43° 24' 2" Site Longitude 76° 28' 34"

c. Tax Map Numbers 183.00 Section 02 Parcel No. 03.100

d. Site Street Address Route 48 in Minetto

8. BRIEFLY DESCRIBE THE SITE (Attach site plan showing disposal/sampling locations)

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a. Area 11 acres b. EPA ID Number NYD000285478

c. Completed (X)Phase I (X)Phase II ( ) PSA (X)RI/FS ( )PA/SI (X)Other Remedial Action

9. Hazardous Waste Disposed (Include EPA Hazardous Waste Numbers)

Lead and chromium (D008 and D007), PCBs
various VOC's and semi VOC's

10. ANALYTICAL DATA AVAILABLE

a. ( )Air (X)Groundwater (X)Surface Water (X)Sediment (X)Soil ( )Waste ( )Leachate ( )EPTox ( )TCLP
b. Contravention of Standards or Guidance Values

letals, VOC's and semi VOC's in soils, groundwater and surface water(s); Metals in sediments

11. CONCLUSION

All work required in ROD is complete. A long-term operation and maintenance plan is being developed and implemented. Periodic sampling of the groundwater monitoring wells and leachate discharge for baseline and routine groundwater parameters is included in the O&M for the site. Site boundaries are being modified to encompass only the remediated landfill, other areas are being excluded.

12. SITE IMPACT DATA

a. Nearest Surface Water: Distance on-site	Direction N/A		Classification D		
b. Nearest Groundwater: Depth 5 ft.	Flow Direction north		( )Sole Source ( )Primary ( )Principal		
c. Nearest Water Supply: Distance 1500 ft.	Direction south		Active (X)Yes ( )No		
d. Nearest Building: Distance 1000 ft.	Direction south		Use residential		
e. In State Economic Development Zone?	( )Y	(X)N	i. Controlled Site Access? Partial	(X)Y	( )N
f. Crops or livestock on site?	( )Y	(X)N	j. Exposed hazardous waste?	( )Y	(X)N
g. Documented fish or wildlife mortality?	( )Y	(X)N	k. HRS Score below listing for NPL, < 28.5		
h. Impact on special status fish or wildlife resource?	( )Y	(X)N	l. For Class 2: Priority Category 1		

13. SITE OWNER'S NAME	14. ADDRESS	15. TELEPHONE NUMBER
Town of Minetto and Oswego County	Minetto, New York 13115	unknown

16. PREPARER	17. APPROVED
Signature 5/22/97 Date	x Signature 5-22-94 Date
Michael Cinquanta Project Manager NYSDEC	GEORGIE HARRIS PE III, BCS/DER
Name, Title, Organization Project Manager, DER, BCS	Name, Title, Organization

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL REMEDIATION 5/27/97
INACTIVE HAZARDOUS WASTE DISPOSAL REPORT

CLASSIFICATION CODE: 4 REGION: 7 SITE CODE: 738012
EPA ID: NYD000285478

NAME OF SITE : Columbia Mills Company
STREET ADDRESS: Route 48

TOWN/CITY:	COUNTY:	ZIP:
Minetto	Oswego	13115

SITE TYPE: Open Dump- X Structure-X Lagoon- Landfill- Treatment Pond-
ESTIMATED SIZE: 11 Acres

SITE OWNER/OPERATOR INFORMATION:
CURRENT OWNER NAME....: Town of Minetto & Oswego County
CURRENT OWNER ADDRESS.: Minetto, NY
OWNER(S) DURING USE...: Columbia Mills Company
OPERATOR DURING USE...: Columbia Mills Corp.
OPERATOR ADDRESS.....: Route 48, Minetto, NY
PERIOD ASSOCIATED WITH HAZARDOUS WASTE: From 1887 To 1977

SITE DESCRIPTION:
Columbia Mills was a factory that manufactured vinyl window shades & coverlets, that closed in 1977. Wastes stored in the buildings have been removed. Organic contamination from buried tanks has been confirmed. High levels of heavy metal contamination has been confirmed in the drum disposal area at the back of the plant property by the swamp. Several underground storage tanks (USTs) were removed by August 1988. Asbestos had been found on site and the USEPA initiated an emergency response to remove it. The EPA also took down the huge on-site chimney. An Order for an Interim Remedial Measure (IRM) & a Remedial Investigation/Feasibility Study (RI/FS) was signed in March 1989 by the PRPs (Columbia Mills, Inc.). The RI/FS was completed in early 1992. A Record of Decision (ROD) was signed on March 31,1992. The ROD calls for the consolidation and capping of wastes and site sediments in the drum disposal area, the removal of sediments in the plant sewers, and the treatment of groundwater in a contaminated "hot spot" area near a former underground storage tank. The IRM consisted of three activities. The first part consisted of excavating, drumming & disposing PCB contaminated soil in the area of the old boilerhouse. The work was completed in December of 1989. The second part consisted of treatment of the solvent contaminated soil from excavations of the USTs and was conducted in July and August 1990. The third part consisted of remediation of the contaminated soil near test pit No. 3 by vacuum extraction. This task has been completed. A Consent Order for a Remedial Design/Remedial Action (RD/RA) was been signed. By April 1994, all RD had been completed. Construction related to the sewers & activities for UST area No. 1 were complete in May 1994. Landfill capping has been completed, and the site has moved into the O&M Phase. The site boundaries have been modified to encompass only the capped landfill.

HAZARDOUS WASTE DISPOSED:

TYPE	QUANTITY (units)
Solvents	unknown
Heavy metals	unknown
PCBs	unknown

SITE CODE: 738012

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

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

LEGAL ACTION:

TYPE..: C.O., RI-FS and IRMs State- X Federal-
STATUS: Negotiation in Progress- Order Signed- X

REMEDIAL ACTION:

Proposed- Under design- In Progress- Completed-X
NATURE OF ACTION: Soil removal and remediation

GEOTECHNICAL INFORMATION:
SOIL TYPE:
GROUNDWATER DEPTH: 5 ft.

ASSESSMENT OF ENVIRONMENTAL PROBLEMS:

Groundwater contamination has been confirmed in the main plant area and to a lesser degree in the drum disposal area. Metal contamination is present in the drum area and pond sediment.
Due to the remedial measures conducted, hazardous waste has been placed in a capped landfill, eliminating exposure potential.

ASSESSMENT OF HEALTH PROBLEMS:

Direct contact and inhalation concerns arose because this site was heavily trespassed by recreational users allowing for exposures to soils containing heavy metals and asbestos. Measures to cap the heavy metals area and eliminate access as requested by DOH were implemented. Sampling of private wells did not detect site-related impacts and a drinking water survey found that private wells are upgradient of the site. The surface water ponds onsite are contaminated. The site is fences and no additional exposure concerns have been identified. The ROD incorporates a variety of measures which will remove, treat or encapsulate the wastes in a manner which will permanently eliminate exposures.

15 (12-75)

New York State Department of Environmental Conservation

MEMORANDUM

TO: Earl Barcomb, Director, Bureau of Hazardous Site Control
FROM: George Harris, Chief, Western Field Services Section
SUBJECT: THRU: H. Richard Koelling, Director, Bureau of Construction Services
DATE: Site Reclassification - Columbia Mills, Oswego County, Site No. 7-38-012

MAR 2 5 1997

Remedial work at the Columbia Mills Landfill was performed in accordance with the Record of Decision and the approved Contract Documents and is now considered complete. The landfill was the last part of the overall remedial work to be performed on the site.

It is proposed to reclassify the site from a class 2 "significant threat to the public health or environment - action required" to a class 4 "site properly closed - requires continued management".

This proposal is based on the fact that the landfill has been properly capped, extraction and treatment of groundwater in UST Area 1 with vapor extraction of soil hot spots is complete and the former plant sewers have been abandoned. Additionally, the PRP completed a number of IRMs including fencing of the main plant area, removal of over 100 containers of chemicals, removal of 8 underground storage tanks, placement of a six inch soil cover over the former drum disposal area, removal of building 8 soils contaminated with PCBs, spreading/aerating stockpiled soils and vapor extraction of test pit 3 soils. Also, USEPA is conducting a response action to address asbestos contamination which includes demolition and removal of the former plant buildings.

This reclassification should include modifications to the "site" boundaries to include the landfill area only. The remaining areas of the property are now considered remediated and require no continued management. Refer to the "as-builts" attached to the Final Remediation Report for the surveyed boundary of the cap system and associated components (i.e., the area fenced and the frog pond).

A summary of previous reports describing the completed work follows:

Operable Unit	Work	Report
A1	Tank Pull	Oct'88 RI Report (pages 3-1 to 3-9)
B1	Soil Tanks	Treatment of VOC contaminated soils from UST excavations by Malcolm Pirnie 12/90
B1	PCBs	Removal of PCB contamination in Bldg. 8 Area by Malcolm Pirnie 1/90
C1	UST Area 3	Attached

Operable Unit	Work	Report
02	UST Area 1	Attached
01	Sewer Cleaning	Sewer Decommissioning Project by Malcolm Pirnie 1/94
03	Landfill	Attached

Reports for operable units A1 and 01 can be found in the non-administrative record (D. Camp). Operable Unit B1 reports are included in the formal administrative record (T. Bennett).

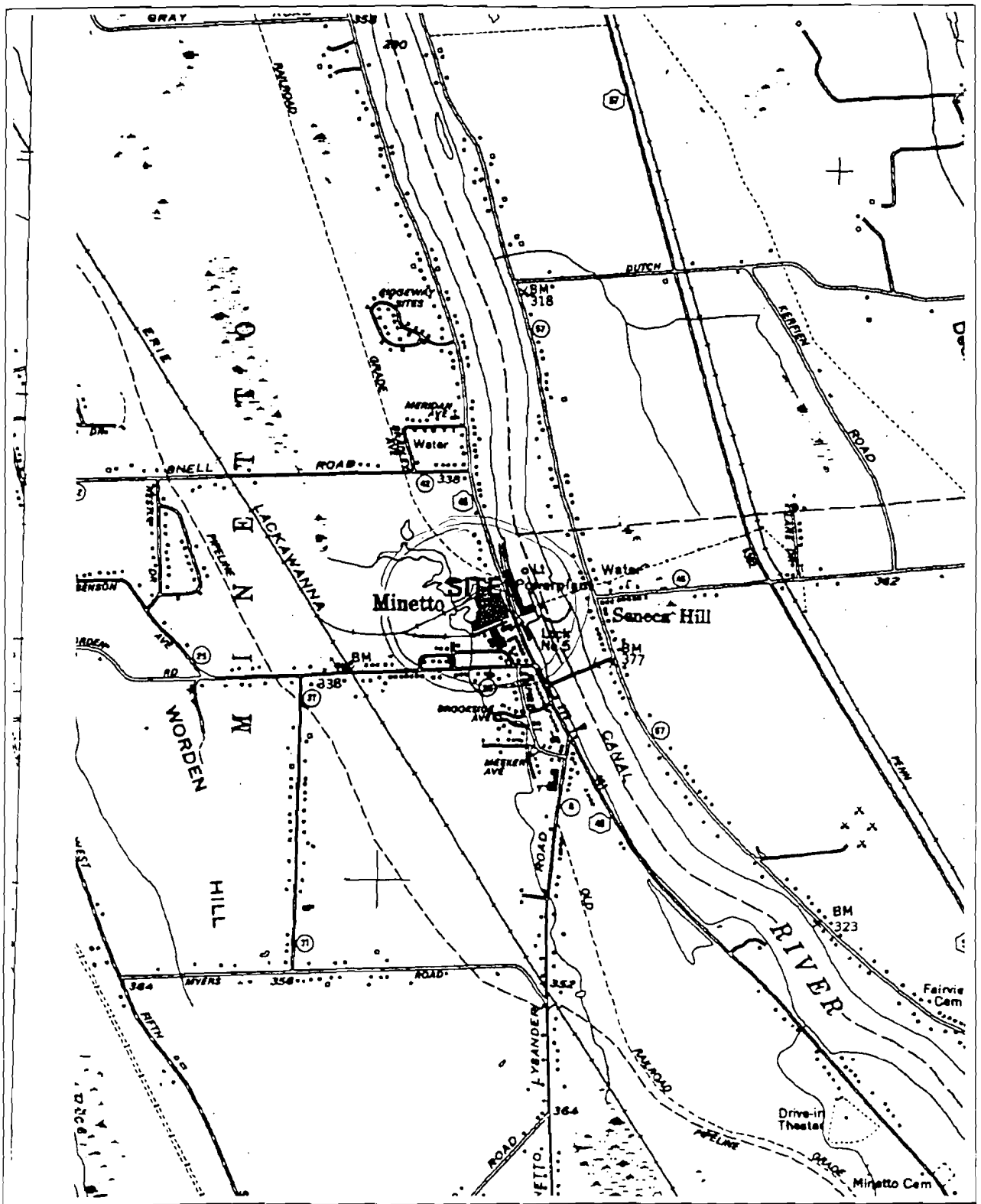
A copy of the Post Closure Operations, Maintenance and Monitoring Plan is also attached for your information.

A site registry site classification decision form for the site is attached.

If you have any questions, please call Michael Cruden at 7-7878.

Attachment

cc: w/o Att.: C. Branagh - NYSDEC Region 7
R. Heerkens - NYSDOH



Site Location Map

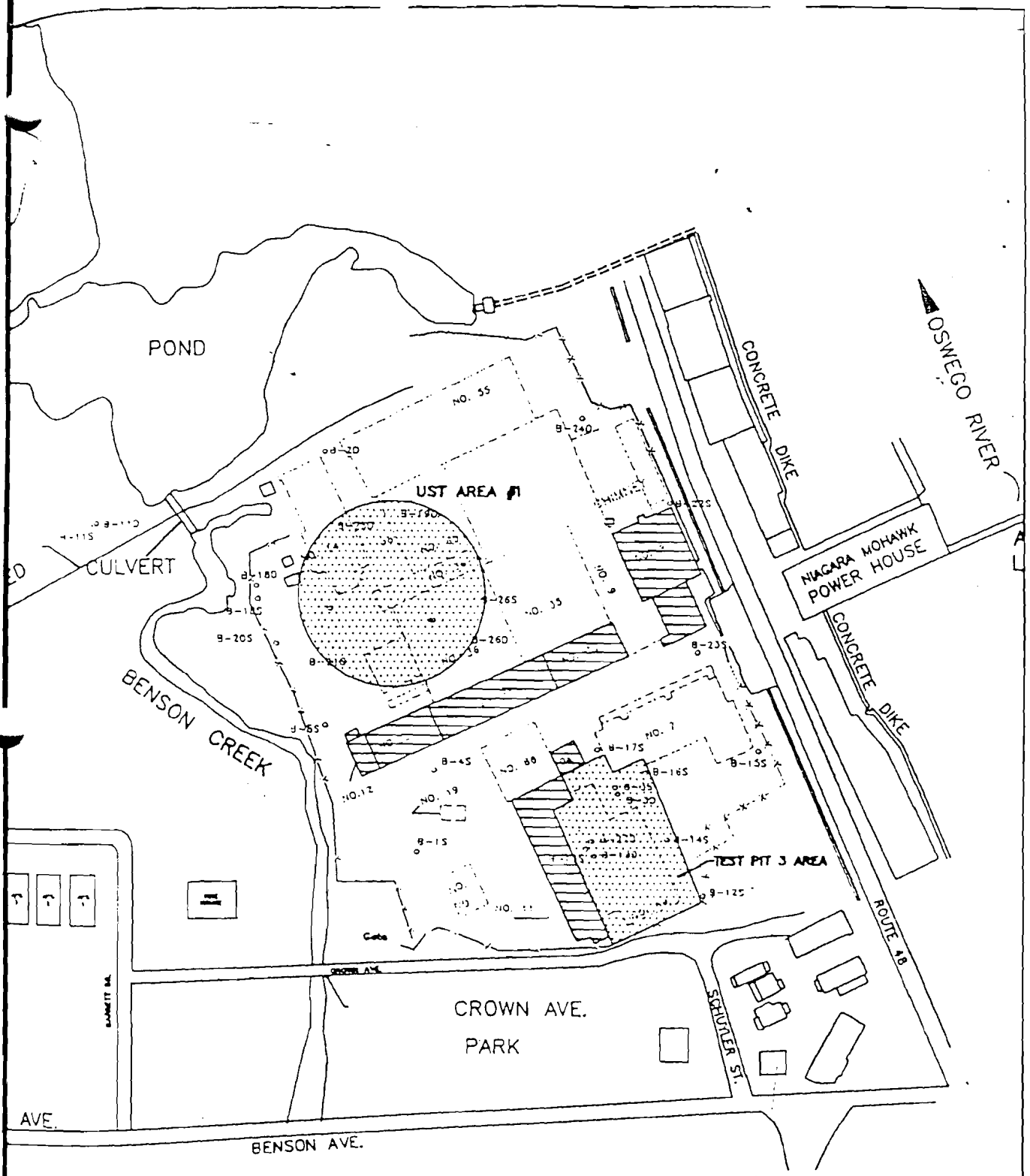
738012 Columbia Mills Company

NYSDOT Planimetric Quadrangle(s):
OSWEGO WEST, OSWEGO EAST

N

0 500 1000 1500 2000
FEET

Scale 1:24,000



MALCOLM PIRNIE

COLUMBIA MILLS
UST AREA #1 & TEST PIT 3 LOCATION MAP

MALCOLM PIRNIE, INC.

FIGURE 1-1

Columbia Mills Site

Minetto (T), Oswego County, New York

Site No. 7-38-012

RECORD OF DECISION

March 1992

Prepared by:
New York State Department of Environmental Conservation
Division of Hazardous Waste Remediation

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233

Thomas C. Jorling
Commissioner

DECLARATION STATEMENT - RECORD OF DECISION (ROD)

Columbia Mills Site
Minetto, Oswego County
Site No. 07-38-012

Statement of Purpose

The Record of Decision (ROD) sets forth the selected Remedial Action Plan for the Columbia Mills inactive hazardous waste site. This Remedial Action Plan was developed in accordance with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, and the New York State Environmental Conservation Law (ECL). The selected remedial plan complies to the maximum extent practicable with the National Oil and Hazardous Substance Pollution Contingency Plan, 40 CFR Part 300, of 1985.

Statement of Basis

This decision is based upon the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the Columbia Mills 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 5 of the ROD.

Description of Selected Remedy

The selected remedial action plan will control the potential contaminant routes of exposure to human health and the environment through excavation, capping and containment, and treatment of the source waste. The remedy is technically feasible and complies with the statutory requirements. Briefly, the selected remedial action plan includes the following:

A) Stabilize and cap wastes in the former plant disposal area and collected and treat groundwater from the area of capped wastes. Wastes in the landfill area will be

stabilized to prevent leaching of metals followed by containment. Containment will consist of the construction of a single membrane barrier cap in conjunction with a barrier drain to collect and transport for treatment, the leachate from the fill. In addition a second trench system will drain three ponds which currently form the edges of the landfill and will serve to direct surface water and groundwater away from the containment area. The contaminated pond and stream sediments, as well as soils and sediments from the main plant also contaminated with metals will also be included in this on-site containment system.

This containment system will eliminate the infiltration of precipitation into the landfill waste, prevent migration of contaminants into the surrounding environment, and will prevent the direct contact by both people and wildlife with the waste. Leachate will be collected and is expected to be treated on site and discharged to surface water or collected for off-site treatment, as appropriate. Treatment will meet the appropriate permit requirements for its discharge.

A groundwater monitoring program will be implemented to monitor the effectiveness of this system. Since the selected remedy results in hazardous wastes remaining on site, at a minimum, a five-year review of the effectiveness of the remedy is required. This review will be conducted to evaluate whether the implemented remedy continues to provide adequate protection of human health and the environment.

B) Extraction and treatment of the volatile organic compound contaminated groundwater in the UST Area 1 with vapor extraction treatment of soil hot spots. Groundwater treatment will commence first and will control contaminant migration in the aquifer. The vacuum extraction will be used only as necessary to remediate contaminated soil hot spots. Groundwater will be treated as necessary to meet the appropriate permit requirements for its discharge. Treatment is expected to be accomplished with air stripping or carbon absorption, and will be discharged to surface water. Groundwater and soils treatment design will incorporate proper controls so that all air discharge and water quality standards or criteria for discharge will be met.

C) Remove the sediments from the plants sewers and dispose of in the on-site landfill or off-site facility followed by the abandonment of sewer lines. This remedy will project the public health by eliminating the possibility of future contact with these materials and will eliminate current discharges to the Oswego River. It is expected that most sediments will be disposed of on the on-site landfill. However, any sediments which test as characteristic hazardous waste or contain high levels of organic contamination will be disposed of in an off-site facility.

New York State Department of Health Acceptance

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

Declaration

The selected Remedial Action Plan is protective of human health and the environment. The remedies selected will meet the substantive requirements of the Federal and State laws, regulations and standards that are applicable or relevant and appropriate to the remedial action. The remedies will satisfy, to the maximum extent practicable, the statutory preference for remedies that employ treatment that reduce toxicity, mobility or volume as a principal element. This statutory preference will be met in the landfill by eliminating the mobility of contaminant pathways of exposure to human health and the environment through the installation of a containment system for the source waste at this site. In UST Area 1, the toxicity, mobility and volume of contaminants in the soil and groundwater will be reduced by the treatment system to be implemented, while in the sewer systems, the mobility of the contaminants will be addressed by their removal from an area of active migration on the sewers and contained either on or off site.

3-5-92
DATE

Edward O. Sullivan
Deputy Commissioner

2.2 VAPOR EXTRACTION SYSTEM

A schematic of the vapor extraction system is included in Figure 3. At the end of 1993, all Test Pit 3 Area vacuum wells had been shut down (December 23, 1993) and arrangements had been made for the changeout of the carbon in both vapor phase adsorbers. Both adsorbers were changed out on January 12, 1994, and the vapor extraction system was restarted on January 13, 1994. Listed below are the start-up and shut-down dates for the vapor extraction system during 1994. These dates refer to the periods of operation of the vacuum wells, or the actual vapor extraction system. The vacuum pump does also operate during groundwater treatment, serving to capture vapors from the first and last tanks in the groundwater treatment system for vapor carbon treatment.

Days of System Operation	Notes
Jan 13 - Jan 28	All VWs turned off Jan 28 - low contaminant concentrations in vapors, system turned off to allow contaminant vapors to build back up in Test Pit 3 Area soil
Feb 4 - Mar 17	All VWs turned off Mar 17 - low contaminant concentrations in vapors and relatively low removal efficiency being achieved by primary carbon adsorber, system turned off to allow vapors to build back up in soil
Mar 21 & Apr 1	Tried to start vacuum wells; however, low contaminant concentrations in vapors and elevated groundwater levels in vacuum wells did not permit startup at this time
May 31 - Jun 30	All VWs turned off Jun 30 - normalized treatment efficiency of primary carbon dropped below 70%, VWs had been shut down for a few days during this time period for groundwater system modification

Jul 15 - Jul 25	All VWs shut down on July 25 (following a power failure in the Town) for system maintenance
Aug 2 - Aug 11	All VWs except VW-5 in operation; VWs shut down for approx. 2 days during this period of time due to power failure in Town; all VWs turned off Aug 11 for transition of operations from The Columbia Mills, Inc. to the NYSDEC
Nov 9 - Nov 23	Vacuum wells VW-1, 3, 4, and 9 turned on Nov 9; VWs 2 and 5 turned on Nov 15; VW-7 turned on Nov 18; all VWs turned off Nov 23 - low contaminant concentrations in vapors, system turned off to allow contaminant vapors to build back up in Test Pit 3 Area soil

When the vacuum wells were shut off on November 23, it was planned to restart them during the following week and cycle them on and off during December. However, the wells remained off through the end of December. Buildup of pressure in the vapor extraction system raised concern regarding the increased load placed on the vacuum pump's motor. Malcolm Pirnie investigated possible causes and solutions to this problem; however, no cause could be determined.

Operation of the vapor extraction system during 1994 was affected by the level of the groundwater table in the Test Pit 3 Area. Groundwater levels began to increase during March due to the snow melt and amount of precipitation received, and levels remained high during April and May. Because of this increase in elevation of the water table, the vacuum wells could not be put into operation during this period of time.

The vacuum wells operated for a total of approximately 113 days during 1994.

3.3 VAPOR EXTRACTION SYSTEM

Air Monitoring and Sampling

Vapor extraction system air monitoring and sampling were performed during 1994 to ensure air discharge limits were being met and to monitor vapor phase carbon performance. Periodic monitoring of the air stream was conducted by Malcolm Pirnie with a Foxboro Century OVA (Model 108) flame ionization meter during system operation. Monitoring was conducted in accordance with the schedules contained in the Test Pit 3 Area Treatment Trailer Operations 1993 Annual Report, revised May 1994, and the July 1994 New York State Superfund Standby Contract Project Work Plan. A summary of OVA meter results is provided in Table 2.

Air samples of the primary carbon unit influent (the stream entering the first in the series of two carbon adsorbers) and the primary carbon effluent (the stream exiting the first adsorber and entering the second adsorber) were also obtained by Upstate Laboratories, Inc. (Upstate), East Syracuse, New York following each month-long period of operation. This was done in accordance with the schedules contained in the report and work plan mentioned above. The air samples were analyzed for USEPA 8240 VOCs. Analysis for phenol was performed during the first part of the year; however, this compound was dropped from the monitoring requirements since it was not normally detected and did not appear to be a Test Pit 3 Area contaminant. The requirement of analyzing the effluent stream from the secondary carbon unit (the air being discharged to the atmosphere) was also dropped during 1994 since discharge limits for the system apply to the effluent from the first carbon. The second carbon unit is meant to serve only as a back-up. Upstate's analytical results are summarized in Table 3.

Carbon Treatment System Performance - Comparison of Monitoring/Sampling Results to Discharge Limits

As previously mentioned, the air discharge limits for the system are applicable to the primary carbon effluent stream, or the stream entering the secondary carbon unit. Concentration limits and efficiency criteria have been set for each target compound, while a normalized removal efficiency of 70 percent must be met by the primary carbon unit for total hydrocarbons (as measured with the OVA meter). The normalized percent removal

TABLE 2
COLUMBIA MILLS – TEST PIT 3 AREA
VAPOR EXTRACTION SYSTEM
RESULTS OF OVA METER MONITORING – 1994

Date	Time	Primary Influent (ppm)+	Primary Effluent (ppm)+	Secondary Effluent (ppm)+	Normalized Primary % Removal+	Active Wells	Dilution Valve
01/13/94	7:30	Turned on vacuum wells					
	8:00	630	170	150	96	All	Closed
	9:00	600	145	115	94	All	Closed
	10:00	510	130	110	95	All	Closed
01/14/94*	9:30	330	50	40	97	All	Closed
01/17/94	8:00	290	50	30	92	All	Closed
01/18/94	8:00	280	40	25	94	All	Closed
01/19/94	8:00	270	40	30	96	All	Closed
01/28/94	9:00	40	38	37	67	All	Closed
	9:15	Turned off vacuum wells					
02/04/94	8:55	Turned on vacuum wells					
	9:00	270	42	40	99	All	Closed
02/09/94	10:00	100	46	26	73	All	Closed
02/14/94*	8:30	125	25	22	97	All	Closed
03/01/94	8:00	70	35	23	74	All	Closed
03/15/94*	8:30	100	56	28	61	All	Closed
03/17/94	8:00	Turned off vacuum wells					
03/21/94	11:20	Turned on vacuum wells					
	11:30	49	44	38	45	All	Closed
	12:00	38	36	32	33	All	Closed
	12:00	Turned off vacuum wells					
04/01/94	7:30	Turned on vacuum wells					
	8:00	38	34	33	80	All	Closed
	8:15	Turned off vacuum wells					
05/31/94	12:53 PM	Turned on vacuum wells					
	12:55 PM	520	180	140	89	All	Closed
	1:40 PM	490	160	110	87	All	Closed
	2:50 PM	285	98	65	82	All	Opened
06/08/94	8:00	190	56	36	87	All	Opened
06/30/94	10:00	110	80	30	38	All	Opened
	10:10	Turned off vacuum wells					
07/15/94	10:45	Turned on vacuum wells					
	10:45	800	215	140	89	All	Closed
	10:55	770	205	135	89	All	Closed
07/20/94*	8:30	280	100	44	76	All	Closed
07/25/94	Vacuum wells shut off						
08/02/94	11:20	Turned on vacuum wells					
	11:30	>1000	500	360	78	All but VW-5	Closed
	11:45	>1000	500	360	78	All but VW-5	Closed
08/11/94	10:25	500	330	180	53	All but VW-5	Closed
	10:30	Turned off vacuum wells					

NO OPERATION DUE TO HIGH WATER TABLE

TABLE 2
COLUMBIA MILLS – TEST PIT 3 AREA
VAPOR EXTRACTION SYSTEM
RESULTS OF OVA METER MONITORING – 1994

Date	Time	Primary Influent (ppm)+	Primary Effluent (ppm)+	Secondary Effluent (ppm)+	Normalized Primary % Removal+	Active Wells	Dilution Valve
1/09/94	AM	Turned on vacuum wells					
	AM	600	310	240	81	1,3,4,9	Closed
1/15/94	AM	82	38	28	81	1-5,9	Closed
1/18/94	AM	120	68	50	74	1-5,7,9	Closed
1/22/94	AM	72	24	22	96	1-5,7,9	Closed
1/23/94	AM	42	12	10	94	1-5,7,9	Closed
	AM	Turned off vacuum wells					

NOTES: Total air flow rate = 210-220 cfm

* – Upstate Labs at site to obtain air samples for lab analysis

\+ – Definitions:

The primary influent concentration is the concentration of contaminants, as measured with the OVA meter, in the air stream entering the first in the series of two carbon adsorbers.

The primary effluent concentration is the concentration of contaminants, as measured with the OVA meter, in the air stream after the air has passed through the first carbon adsorber. This is the concentration of contaminants entering the second carbon adsorber.

The secondary effluent concentration is the concentration of contaminants, as measured with the OVA meter, in the air stream after the air has passed through both carbon adsorbers. This is the concentration being discharged to the atmosphere.

The normalized percent removal takes into account the effluent concentration of the secondary carbon. To calculate this removal, the secondary effluent concentration was first subtracted from each of the two readings for the primary unit. The percent removal was then calculated. This assumes that what is passing through the secondary unit cannot be treated with carbon in general (e.g. methane).

No OVA readings were taken between August 11, 1994 and September 30, 1994 since the entire facility was shut down. No readings were taken during October because all vacuum wells remained off.

No OVA readings were taken during the month of December, as all vacuum wells remained off.

TABLE
COLUMBIA MILLS – TEST PIT 3 AREA SYSTEM
ROUTINE VAPOR EXTRACTION SYSTEM SAMPLING
SUMMARY OF ANALYTICAL RESULTS – 1994
TARGET COMPOUNDS DETECTED OR PREVIOUSLY DETECTED

PARAMETER	OVA Reading	USEPA 8240 Volatile Organics							
		Ethylbenzene		Toluene		Xylenes		Phenol	
DATE	ppm	µg/m3	ppm	µg/m3	ppm	µg/m3	ppm	µg/m3	ppm
Primary Vapor Carbon Influent									
01/14/94	330	<50	<0.0115	<50	<0.0133	100	0.0230	<77	<0.0200
02/14/94	125	<75	<0.0173	<75	<0.0199	110	0.0253	<77	<0.0200
03/15/94	100	<50	<0.0115	<50	<0.0133	52	0.0120	<77	<0.0200
07/20/94	280	<210	<0.0484	<210	<0.0557	<210	<0.0484	--	--
Primary Vapor Carbon Effluent									
01/14/94	50	<5	<0.0012	<5	<0.0013	<5	<0.0012	<77	<0.0200
02/14/94	25	<5	<0.0012	<5	<0.0013	<5	<0.0012	<77	<0.0200
03/15/94	56	<5	<0.0012	<5	<0.0013	<5	<0.0012	<77	<0.0200
07/20/94	100	<100	<0.0230	<100	<0.0265	<100	<0.0230	--	--
Secondary Vapor Carbon Effluent									
01/14/94	40	<5	<0.0012	<5	<0.0013	<5	<0.0012	<77	<0.0200
02/14/94	22	<5	<0.0012	<5	<0.0013	<5	<0.0012	<77	<0.0200
03/15/94	28	<5	<0.0012	<5	<0.0013	<5	<0.0012	<77	<0.0200
Max Allowable Discharge Limit for the Primary Vapor Carbon	--	278098	64.0	278098	73.8	278098	64.0	--	--
Control/Media Blank									
01/14/94	--	<0.04 µg	--	<0.04 µg	--	<0.04 µg	--	<5 µg	--
02/14/94	--	<0.025 µg	--	<0.025 µg	--	<0.025 µg	--	<5 µg	--
03/15/94	--	<0.05 µg	--	<0.05 µg	--	<0.05 µg	--	<5 µg	--
07/20/94*	--	<0.2 µg	--	0.3 µg	--	<0.2 µg	--	--	--

Notes:

-- = not applicable or not analyzed

* = indicates methylene chloride also detected at 0.6 ug, and acetone detected at 1.4 ug.

A known volume of air was collected for each sample then passed through two carbon adsorbant tubes in series. The VOCs adsorb onto the carbon; the carbon is then analyzed for VOCs.

Conversion from µg/m³ to ppm assumes T = 77°F and V = 24.45.

ppm = [(µg/m³)(V)]/[(molecular weight)(1000)]

takes into account the effluent concentration of the secondary carbon; the secondary effluent concentration is first subtracted from each of the two readings for the primary unit before calculating the percent removal. This assumes that what is passing through the secondary unit cannot be treated with carbon in general (eg., methane); this assumption is based on results of air sampling conducted since system start-up in 1993.

As is apparent from the OVA meter data in Table 2, contaminant concentrations in the vapor removed from the Test Pit 3 Area soil were initially high each time the vacuum wells were started. Concentrations and, subsequently, the removal efficiency of the carbon then dropped over time. Once the efficiency of the primary carbon dropped to near 70 percent, the system was shut off, and contaminant vapors were allowed to build back up in the soil. The system was then restarted, and this cycling continued through the year.

Results of air sampling performed by Upstate after each month of vacuum well operation indicated that the only target compound present in the air stream from the vacuum wells was xylene. This compound was detected at very low concentrations going into the primary carbon and was not detected coming out. No other target compounds were detected. Thus, discharge limits were met for all target compounds.

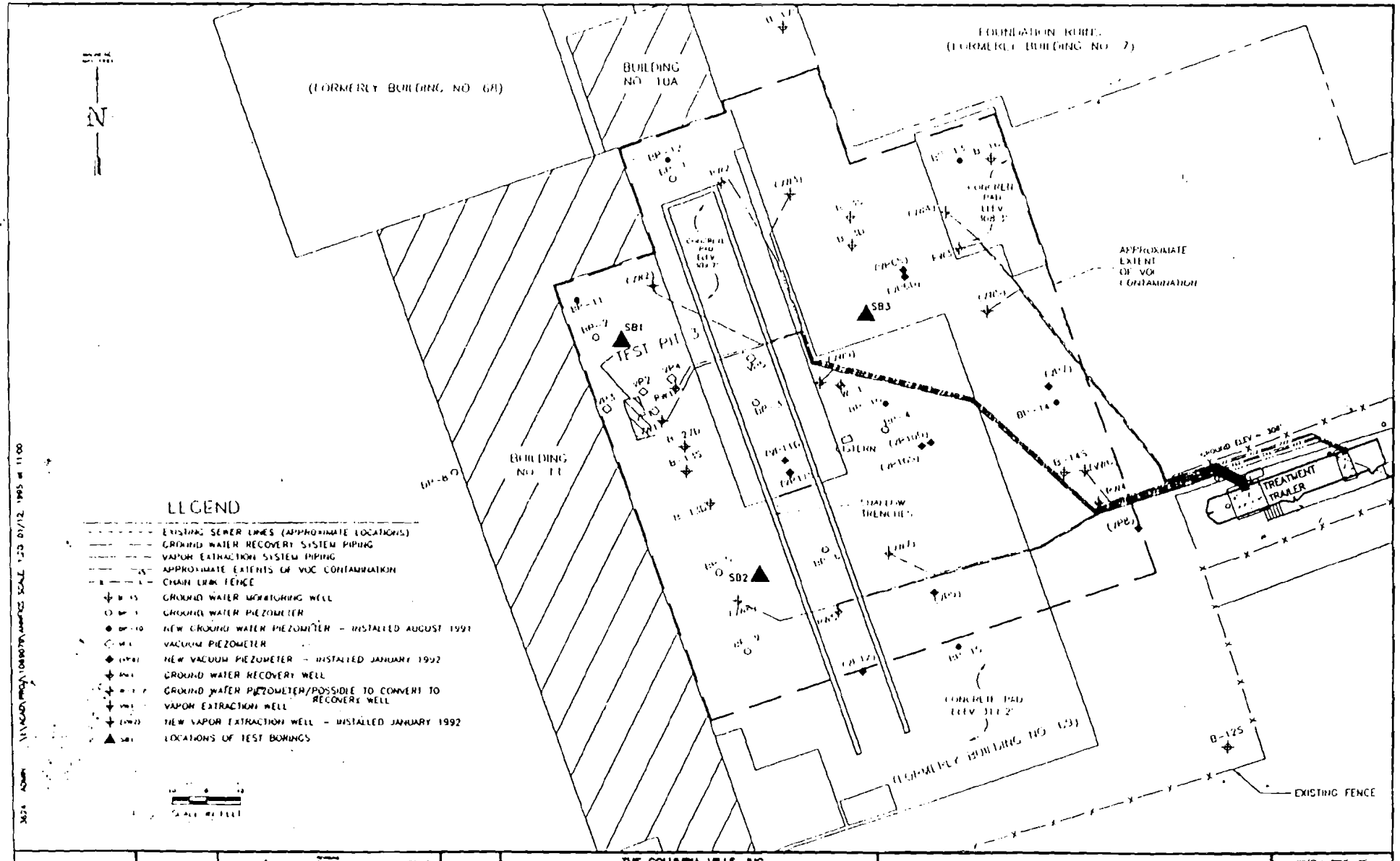
Attachment 4

TABLE 4
COLUMBIA MILLS – TEST PIT 3 AREA
DEC. 13, 1994 SOIL SAMPLING
SUMMARY OF ANALYTICAL RESULTS

Sample Location/Depth		VOLATILE ORGANICS (ug/kg)					TPH (mg/kg)
		Xylenes	Toluene	Methylene Chloride	Acetone	2-Butanone (MEK)	
SB1	5-7 ft.	<11	<11	6JB	13	<11	290
	9-11 ft	<11	<11	6JB	<11	<11	<10
SB2	5-7 ft	1800E	<11	6JB	30	<11	<10
	5-7 ft (DL)	1200D	<57	66BD	51JD	11JBD	—
	7-9 ft	2600E	<55	15JB	14JB	<55	<10
	7-9 ft (DL)	2600D	<1300	910JD	<1300	<1300	—
SB3	6-8 ft.	16	1J	11JB	11J	<12	<10
	10-12 ft	14	2J	11JB	9J	<11	<10
Soil Clean-Up Level*		1200	1500	100	200	300	—

NOTES: TPH = Total Petroleum Hydrocarbons
J = Indicates an estimated value.
B = Indicates compound was found in the associated blank as well as the sample.
E = Indicates compound whose concentration exceeded the calibration range of the analytical instrument.
D = Indicates compound was detected in an analysis at a secondary dilution factor.
(DL) = Indicates diluted sample. The concentrations of xylenes (which initially exceeded the calibration range for both SB2 samples) should be taken from this more dilute analysis.
* = Clean-up levels from NYSDEC TAGM on determination of soil clean-up levels. A soil organic carbon content of 1% was assumed for the calculations.

The soil clean-up goal was also defined in the April 1991 IRM report "Evaluation of Alternatives for Treatment of VOC Contaminated Subsurface Soils In Test Pit 3 Area" as reducing total target VOC concentrations to approximately 1 ppm, or 1000ug/kg.



MALCOLM

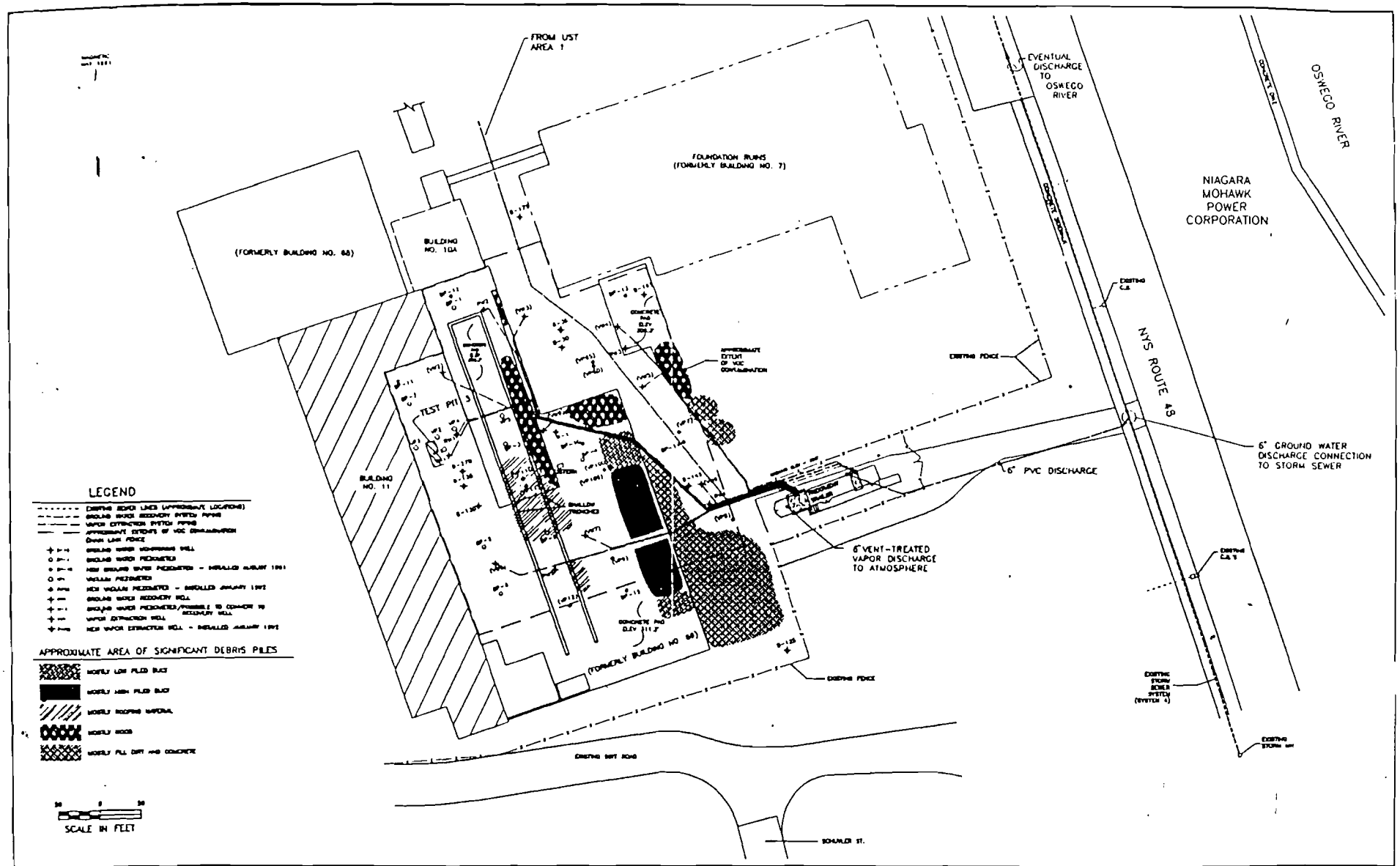
THE COLUMBIA MILLS, INC.
MINETTO, NEW YORK

TEST PIT #3 AREA
VAPOR EXTRACTION SYSTEM

SOIL BORING LOCATIONS

JANUARY 1992

FIGURE 1



MALCOLM PIRNIE

THE COLUMBIA MILLS, INC.
MINETTO, NEW YORK

TEST PIT #3 AREA IRM VAPOR EXTRACTION SYSTEM

SITE PLAN

DATE: JULY 1994

FIGURE 1-2

Attachment 5

Attachment 6

Columbia Mills - Test Pit 3 Area
Vapor Extraction System

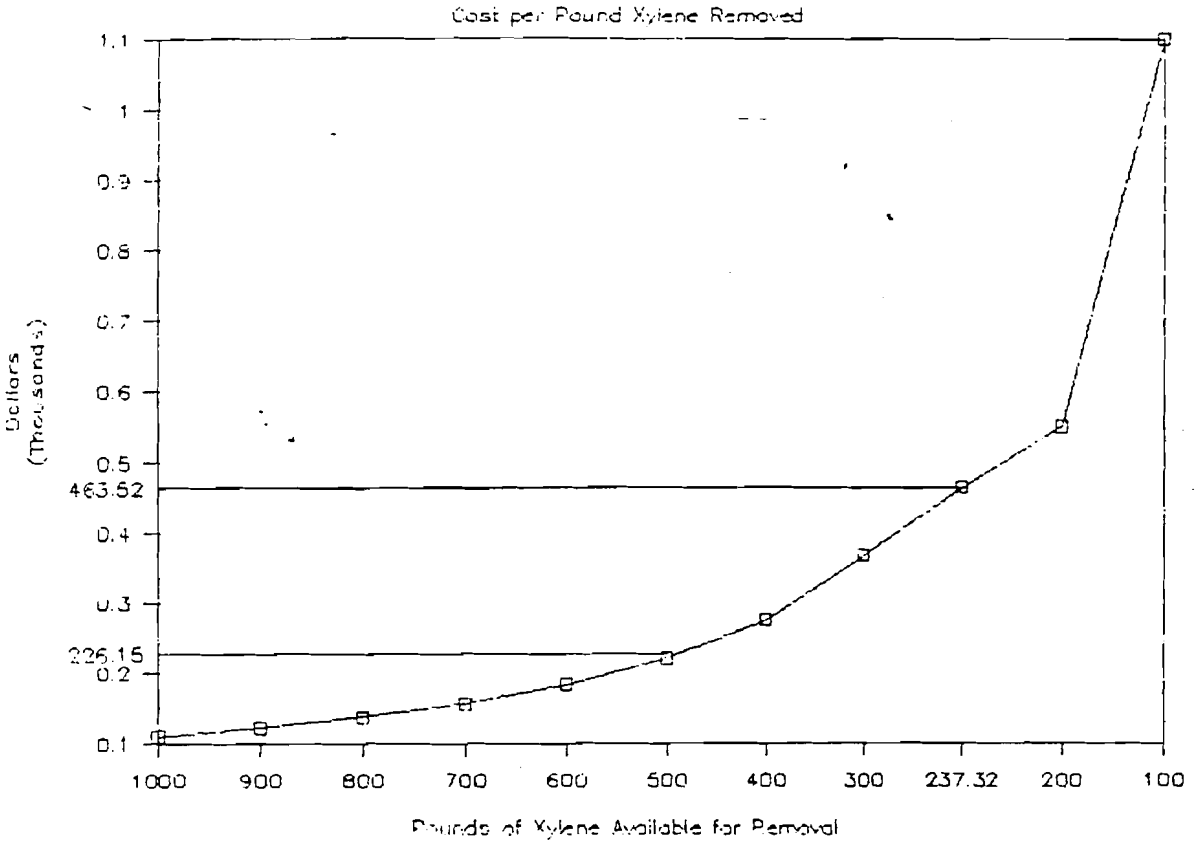
Date	No. of Days	Primary Influent (ppm)	Xylene Removal Rate (lb./hr.)	Xylene Removal Rate (lb./day)	Xylene Removed/ Period (lb.)	Xylene Removed To Date (lb.)	
1/13/94	-	630	2.23	-	0	0.00	
	1 hr	600	2.13	-	2.18	2.18	
	1 hr	510	1.81	-	1.97	4.15	
1/14/94	1	330	1.17	34.98	34.98	39.13	
1/17/94	3	290	1.03	25.82	77.46	116.58	
1/18/94	1	280	0.99	24.24	24.24	140.83	
1/19/94	1	270	0.96	23.39	23.39	164.22	
1/28/94	9	40	0.14	13.25	119.21	283.43	- All VWs turned off - low contaminant
2/4/94	-	270	0.96	0.00	0.00	283.43	concentrations in vapors. System
2/9/94	5	100	0.35	15.87	79.34	362.76	turned off to allow contaminant vapors
2/14/94	5	125	0.44	9.45	47.25	410.01	to build back up in Test Pit Area 3.
3/1/94	15	70	0.25	8.28	124.23	534.24	
3/15/94	14	100	0.35	7.24	101.37	635.61	
3/21/94	-	49	0.17	-	0.00	635.61	- Elevated GW levels. Low concentrations
	0.5 hr	38	0.13	-	0.08	635.68	
4/1/94	-	38	0.13	-	0.00	635.68	- Elevated GW levels. Low concentrations
5/31/94	60	520	1.84	0.00	0.00	635.68	- System turned back on.
	1 hr	490	1.74	-	1.34	637.03	
	1 hr	285	1.01	-	1.65	638.67	
'94	8	190	0.67	20.20	161.61	800.29	
6/30/94	22	110	0.39	12.81	281.76	1082.05	- System shut down for maintenance.
7/15/94	-	800	2.84	-	0.00	1082.05	- System turned back on.
	10 min	770	2.73	-	0.56	1082.60	
7/20/94	5	280	0.99	43.73	218.63	1301.23	
8/2/94	12	500	1.77	0.00	0.00	1301.23	- System shut down 7/25 due to power fai
	15 min	500	1.77	-	0.44	1301.67	
8/11/94	9	500	1.77	42.33	381.00	1682.67	- System shut down for transfer to NYSDE
11/9/94	-	600	2.13	-	0.00	1682.67	- System turned back on.
11/15/94	6	82	0.29	29.01	174.03	1856.70	
11/18/94	3	120	0.43	8.59	25.77	1882.47	
11/22/94	4	72	0.26	8.17	32.66	1915.14	
11/23/94	1	42	0.15	4.85	4.85	1919.99	

System operated a total of 113 days during 1994.

Number of days system operated during the month of November 1994:	14	Operation of system impeded by elevated GW
Pounds of xylene removed during this period:	237.32	levels.
Cost per pound of xylene removed: ($53,669.13/237.32 lbs):	$226.15	

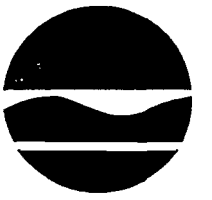
Theoretical maximum amount of xylene that could be removed if plant operates approx. 14 days month for 4 months:	949.26 lbs	This assumes that water table can be sufficiently lowered to allow uninterrupted operation of the vapor recovery wells.
oretical maximum cost per pound of xylene removed ($110,000/237.32 lbs):	$463.52	This assumes that only 237 pounds of xylene is available for removal.
Theoretical minimum cost per pound of xylene removed ($110,000/949.26 lbs):	$115.88	This assumes that 949 pounds of xylene (theoret. max.) is available for removal.

Figure 2


Cost per Pound Xylene Removed
Dollars (Thousands)
1.1
1
0.9
0.8
0.7
0.6
0.5
463.52
0.4
0.3
226.15
0.2
0.1
1000
900
800
700
600
500
400
300
237.32
200
100
Pounds of Xylene Available for Removal

H. Syracuse

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-7010



John P. Cahill
Commissioner

JUL 02 1997

This letter was sent to the people on the attached list.

Dear :

The Department of Environmental Conservation (DEC) maintains a Registry of sites where hazardous waste disposal has occurred. Property located at Route 48 in the Town of Minetto and County of Oswego and designated as Tax Map Number 183-02-03.100 was recently reclassified as a Class 4 in the Registry. The name and site I.D. number of this property as listed in the Registry is Site #738012, Columbia Mills Co.

The Classification Code 4 means that the site is properly closed – requires continued management.

We are sending this letter to you and others who own property near the site listed above, as well as the county and town clerks. We are notifying you about these activities at this site because we believe it is important to keep you informed.

If you currently are renting or leasing your property to someone else, please share this information with them. If you no longer own the property to which this letter was sent, please provide this information to the new owner and provide this office with the name and address of the new owner so that we can correct our records.

The reason for this recent classification decision is as follows:

- All work required in Record of Decision is complete. A long-term operation and maintenance plan is being developed and implemented. Periodic sampling of the groundwater monitoring wells and leachate discharge for baseline and routine groundwater parameters is included in the Operation and Maintenance for the site. Site boundaries are being modified to encompass only the remediated landfill, other areas are being excluded.

If you would like additional information about this site or the inactive hazardous waste site remedial program, call:

DEC's Inactive Hazardous Waste Site Toll-Free Information Number 1-800-342-9296 or New York State Health Department's Health Liaison Program (HeLP) 1-800-458-1158, ext. 402.

Sincerely,

Robert L. Marino
Chief
Site Control Section
Bureau of Hazardous Site Control
Division of Environmental Remediation

bcc: R. Marino
T. Reamon
S. Miller, R/7
A. Sylvester
A. Carlson
L. Ennist
C. Branagh, R/7

AS/srh

Town Clerk
Town of Minetto
Town Hall
P.O. Box 220, Community Drive
Minetto, NY 13115

County Clerk
County of Oswego
County Office Building
46 E. Bridge Street
Oswego, NY 13126

Patricia Labrador
Box 196
Minetto, NY 13115

Bartolo Natoli
P.O. Box 514
Minetto, NY 13115

Don P. and Cathy Bosnic
P.O. Box 439
Minetto, NY 13115

Harold and Dorothy Thorpe
Benson Avenue
Minetto, NY 13115

Norma Kolch
P.O. Box 105
Minetto, NY 13115

Harry and Arlene Knopp
P.O. Box 6
Minetto, NY 13115

Augustine Silveira
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Minetto, NY 13115

Albert and Helen Pfaff
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Minetto, NY 13115

Paul and Janice Hutko
P.O. Box 33
Minetto, NY 13115

James Castiglia
RR 5, Box 139
Oswego, NY 13126

Gary Cunningham
P.O. Box 317
Minetto, NY 13115

Herbert Ranous
P.O. Box 207
Minetto, NY 13115

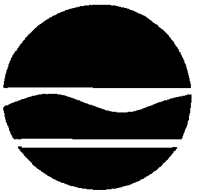
Albert and Helen Pfaff
P.O. Box 75
Minetto, NY 13115

John and Judy Belt
P.O. Box 450
Minetto, NY 13115

Richard and Elaine Cohen
RD. 5, W. River Road
Oswego, NY 13126

A. Syracuse

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-7010



John P. Cahill
Acting Commissioner

JUN 16 1997

Town of Minetto
Town Hall
P.O. Box 220
Community Drive
Minetto, NY 13115

Dear Sir/Madam:

As mandated by Section 27-1305 of the Environmental Conservation Law (ECL), the New York State Department of Environmental Conservation (NYSDEC) must maintain a Registry of all inactive disposal sites suspected or known to contain hazardous waste. The ECL also mandates that this Department notify the owner of all or any part of each site or area included in the Registry of Inactive Hazardous Waste Disposal Sites as to changes in site classification.

Our records indicate that you are the owner or part owner of the site listed below. Therefore, this letter constitutes notification of change in the classification of such site in the Registry of Inactive Hazardous Waste Disposal Sites in New York State.

DEC Site No.: 738012
Site Name: Columbia Mills Company
Site Address: Route 48, Minetto, New York 13115

Classification change from 2 to 4

The reason for the change is as follows:

- All work required in Record of Decision is complete. A long-term operation and maintenance plan is being developed and implemented. Periodic sampling of the groundwater monitoring wells and leachate discharge for baseline and routine groundwater parameters is included in the Operation and Maintenance for the site. Site boundaries are being modified to encompass only the remediated landfill, other areas are being excluded.

Enclosed is a copy of the New York State Department of Environmental Conservation, Division of Hazardous Waste Remediation, Inactive Hazardous Waste Disposal Site Report form as it appears in the Registry and Annual Report, and an explanation of the site classifications. The Law allows the owner and/or operator of a site listed in the Registry to petition the Commissioner of the New York State Department of Environmental Conservation for deletion of such site, modification of site classification, or modification of any information regarding such site, by submitting a written statement setting forth the grounds of the petition. Such petition may be addressed to:

John P. Cahill
Acting Commissioner
New York State Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233-0001

For additional information, please contact me at (518) 457-0747.

Sincerely,

Robert L. Marino
Chief
Site Control Section
Bureau of Hazardous Site Control
Division of Environmental Remediation

Enclosures

bcc: E. Barcomb
R. Marino
T. Reamon
A. Sylvester

w/Enc. (Copy of Site Report form only)
R. Dana
A. Carlson, DOH
J. Sama
S. Ervolina
T. Fucillo, R/7
C. Branagh, R/7
E. Belmore

AS/srh

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-7010

John P. Cahill
Acting Commissioner

JUN 16 1997

County of Oswego
County Office Building
46 E. Bridge Street
Oswego, NY 13126

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John P. Cahill
Acting Commissioner
New York State Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233-0001

For additional information, please contact me at (518) 457-0747.

Sincerely,

Robert L. Marino
Chief
Site Control Section
Bureau of Hazardous Site Control
Division of Environmental Remediation

Enclosures

bcc: E. Barcomb
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w/Enc. (Copy of Site Report form only)
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C. Branagh, R/7
E. Belmore

AS/srh

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL REMEDIATION 091297
INACTIVE HAZARDOUS WASTE DISPOSAL REPORT

CLASSIFICATION CODE: 4 REGION: 7 SITE CODE: 738012
EPA ID: NYD000285478

NAME OF SITE : Columbia Mills Company
STREET ADDRESS: Route 48

TOWN/CITY:	COUNTY:	ZIP:
Minetto	Oswego	13115

SITE TYPE: Open Dump- X Structure-X Lagoon- Landfill- Treatment Pond-
ESTIMATED SIZE: 11 Acres

SITE OWNER/OPERATOR INFORMATION:
CURRENT OWNER NAME....: Town of Minetto & Oswego County
CURRENT OWNER ADDRESS.: Minetto, NY
OWNER(S) DURING USE...: Columbia Mills Company
OPERATOR DURING USE...: Columbia Mills Corp.
OPERATOR ADDRESS.....: Route 48, Minetto, NY
PERIOD ASSOCIATED WITH HAZARDOUS WASTE: From 1887 To 1977

SITE DESCRIPTION:
Columbia Mills was a factory that manufactured vinyl window shades & coverlets, that closed in 1977. Wastes stored in the buildings have been removed. Organic contamination from buried tanks has been confirmed. High levels of heavy metal contamination has been confirmed in the drum disposal area at the back of the plant property by the swamp. Several underground storage tanks (USTs) were removed by August 1988. Asbestos had been found on site and the USEPA initiated an emergency response to remove it. The EPA also took down the huge on-site chimney. An Order for an Interim Remedial Measure (IRM) & a Remedial Investigation/Feasibility Study (RI/FS) was signed in March 1989 by the PRPs (Columbia Mills, Inc.). The RI/FS was completed in early 1992. A Record of Decision (ROD) was signed on March 31,1992. The ROD calls for the consolidation and capping of wastes and site sediments in the drum disposal area, the removal of sediments in the plant sewers, and the treatment of groundwater in a contaminated "hot spot" area near a former underground storage tank. The IRM consisted of three activities. The first part consisted of excavating, drumming & disposing PCB contaminated soil in the area of the old boilerhouse. The work was completed in December of 1989. The second part consisted of treatment of the solvent contaminated soil from excavations of the USTs and was conducted in July and August 1990. The third part consisted of remediation of the contaminated soil near test pit No. 3 by vacuum extraction. This task has been completed. A Consent Order for a Remedial Design/Remedial Action (RD/RA) was been signed. By April 1994, all RD had been completed. Construction related to the sewers & activities for UST area No. 1 were complete in May 1994. Landfill capping has been completed, and the site has moved into the O&M Phase. The site boundaries have been modified to encompass only the capped landfill.

HAZARDOUS WASTE DISPOSED:

TYPE	QUANTITY (units)
Solvents	unknown
Heavy metals	unknown
PCBs	unknown

SITE CODE: 738012

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

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

LEGAL ACTION:

TYPE..: C.O., RI-FS and IRMs State- X Federal-
STATUS: Negotiation in Progress- Order Signed- X

REMEDIAL ACTION:

Proposed- Under design- In Progress- Completed-X
NATURE OF ACTION: Soil removal and remediation

GEOTECHNICAL INFORMATION:
SOIL TYPE:
GROUNDWATER DEPTH: 5 ft.

ASSESSMENT OF ENVIRONMENTAL PROBLEMS:

Groundwater contamination has been confirmed in the main plant area and to a lesser degree in the drum disposal area. Metal contamination is present in the drum area and pond sediment.
Due to the remedial measures conducted, hazardous waste has been placed in a capped landfill, eliminating exposure potential.

ASSESSMENT OF HEALTH PROBLEMS:

Direct contact and inhalation concerns arose because this site was heavily trespassed by recreational users allowing for exposures to soils containing heavy metals and asbestos. Measures to cap the heavy metals area and eliminate access as requested by DOH were implemented. Sampling of private wells did not detect site-related impacts and a drinking water survey found that private wells are upgradient of the site. The surface water ponds onsite are contaminated. The site is fences and no additional exposure concerns have been identified. The ROD incorporates a variety of measures which will remove, treat or encapsulate the wastes in a manner which will permanently eliminate exposures.