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QUARTERLY OPERATING REPORT

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OCT - DEC 1999

WORK ASSIGNMENT D003825-14

**FORT EDWARD LANDFILL
FORT EDWARD (T)**

**SITE NO. 5-58-001
WASHINGTON (C), NY**

Prepared for:
NEWYORKSTATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
50 Wolf Road, Albany, New York
John P. Cahill, Commissioner

DIVISION OF ENVIRONMENTAL REMEDIATION

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Buffalo, New York 14202

QUARTERLY REPORT OF OPERATIONS

OCTOBER 1 TO DECEMBER 31, 1999

FOR THE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

WORK ASSIGNMENT NO. D003825-1

FORT EDWARD LANDFILL

NYSDEC SITE NO. 5-58-001

FORT EDWARD (T), WASHINGTON (C), NEW YORK

SUBMITTED BY:

URS CORPORATION GROUP CONSULTANTS

282 DELAWARE AVENUE

BUFFALO, NEW YORK 14202

MARCH 2001

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1.0 INTRODUCTION

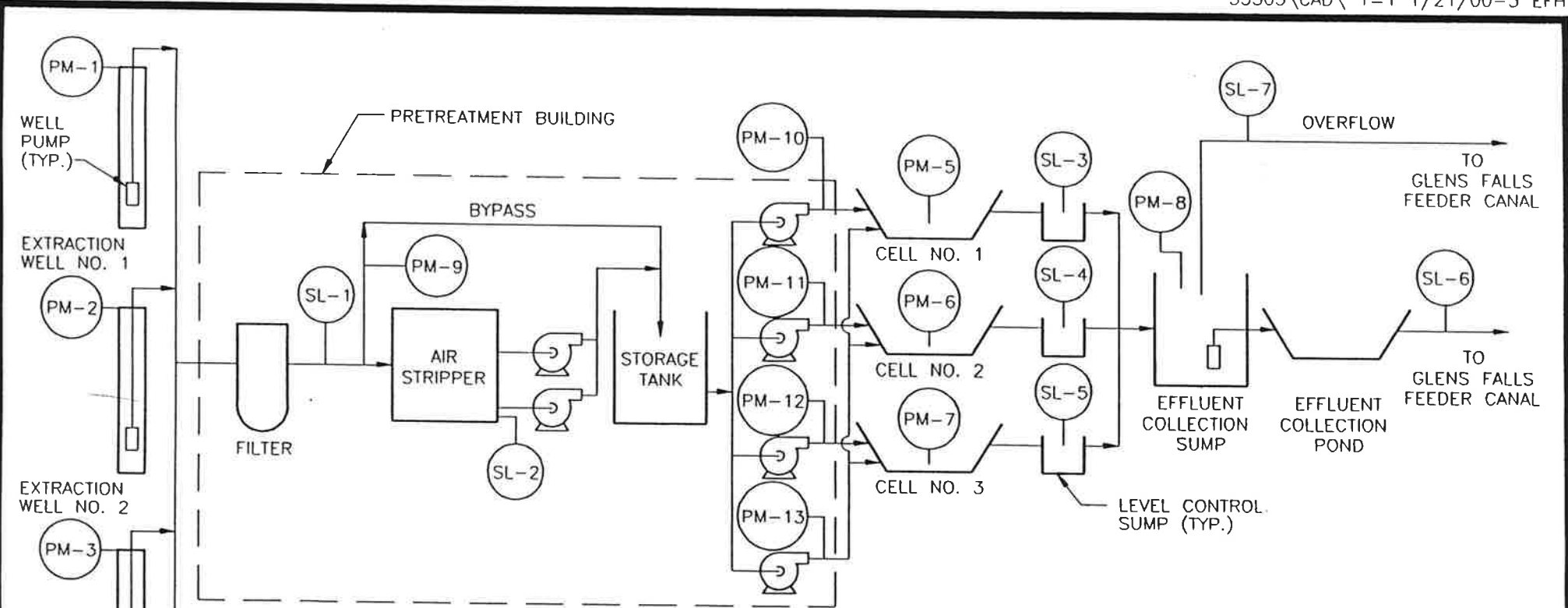
This report summarizes the long-term operation and maintenance (O&M) activities at the Fort Edward Landfill for the period from October 1 to December 31, 1999. The Fort Edward Landfill is a Class 2 Inactive Hazardous Waste Site (No. 5-58-001) located in the Town of Fort Edward, Washington County. The O&M services for this project will be provided for a period of 18 months with system operation reports being submitted on a quarterly basis. This is the third of six scheduled quarterly reports under this work assignment.

The Fort Edward Landfill remediation consists of a final cover system over the landfill, a leachate/groundwater collection system, a landfill gas collection trench, and a groundwater/leachate treatment system; including a pretreatment building and a constructed wetland treatment system (CWTS) with three cells. Refer to Figure 1 for a schematic of the process.

The air stripper was installed to remove volatile organic compounds (VOCs) from the water. During the start-up period, however, it became apparent that the air stripper was not needed, since the concentrations of VOCs in the influent were below the discharge criteria. As a result, the air stripper is not currently being used.

Also, the deposit control chemical FeREMEDE[®] is added to the incoming water to keep the iron in solution, thereby preventing it from depositing and fouling the system.

Mitekem Corporation provided analytical services for the first of eight weekly sampling events and the first round (year 1) of groundwater and surface water sampling. On May 14, 1999, the Department requested that URS Corporation Group Consultants (URS) utilize the New York State Department of Health (NYSDOH) laboratory for all analytical services after June 1, 1999. All analytical results included in this report are from the NYSDOH laboratory.



PROCESS MONITORING LOCATION KEY

- PM-1 = LEVEL EXT. WELL NO. 1
- PM-2 = LEVEL EXT. WELL NO. 2
- PM-3 = LEVEL EXT. WELL NO. 3
- PM-4 = LEVEL COLLECTION TRENCH SUMP
- PM-5 = LEVEL CELL 1
- PM-6 = LEVEL CELL 2
- PM-7 = LEVEL CELL 3
- PM-8 = LEVEL EFFLUENT COLLECTION SUMP
- PM-9 = BYPASS FLOW
- PM-10 = DISCHARGE FLOW TO CELL 1
- PM-11 = DISCHARGE FLOW TO CELL 2
- PM-12 = DISCHARGE FLOW TO CELL 3
- PM-13 = DISCHARGE FLOW TO EITHER CELL 1, CELL 2 OR CELL 3

SAMPLE LOCATION KEY

- SL-1 = AST INFLUENT
- SL-2 = AS EFFLUENT
- SL-3 = CELL 1 EFF
- SL-4 = CELL 2 EFF
- SL-5 = CELL 3 EFF
- SL-6 = POND EFF
- SL-7 = OVERFLOW

LEGEND

- (PM) PROCESS MONITORING LOCATION
- (SL) SAMPLE LOCATION
- (PUMP) PUMP

2.0 PROCESS MONITORING

Process monitoring includes physical measurements of process parameters. Measurements for this remediation system include flow rates and water levels. The flow rates are measured at five (5) locations, and the water levels are measured at eight (8) locations (Figure 1). Measurements for the period are summarized in Table 1.

3.0 PERFORMANCE MONITORING

Performance monitoring included water sampling and analysis at two (2) locations (SL-1 and SL-6 on Figure 1). The analytical results are utilized to evaluate the progress of the remediation at the site.

The samples were analyzed for target compound list (TCL) volatile organic compounds (VOCs) by NYSDEC ASP Method 95-1 and site-specific target analyte list (TAL) metals by NYSDEC ASP Methods CLP-M. Each effluent sample was also analyzed for total dissolved solids by Standard Method SM2540C, total suspended solids by SM2540D, total phenols by SM5530B and pH by SM4500H.

System influent (SL-1) and effluent (SL-6) results for all detected analytes are summarized in Table 2 (VOCs) and Table 3 (Metals). The data for total dissolved solids (TDS), total suspended solids (TSS), total phenols and pH, of the effluent samples, are summarized in Table 4. Analytical results are included in Appendix A.

During this operating period, the discharge criterion (500 mg/l) for total dissolved solids (TDS) was exceeded in all three effluent samples. However, the average TDS concentration for this period (535 mg/l) is less than last period (619 mg/l).

TABLE 1
PROCESS MONITORING SUMMARY

MONITORING LOCATION	PARAMETER	OCTOBER 1999	NOVEMBER 1999	DECEMBER 1999
PM-1	Level (ft of H ₂ O)	NM	5.2	5.6
PM-2	Level (ft of H ₂ O)	NM	9.6	10.4
PM-3	Level (ft of H ₂ O)	NM	6.9	19
PM-4	Level (ft of H ₂ O)	NM	4.7	4.7
PM-5	Level (ft of H ₂ O)	2.2 - 2.4	2.3 - 2.4	2.3 - 2.4
PM-6	Level (ft of H ₂ O)	2.3 - 2.4	2.3 - 2.4	2.3 - 2.4
PM-7	Level (ft of H ₂ O)	2.5	2.5 - 2.6	2.5 - 2.6
PM-8	Level (ft of H ₂ O)	NM	4.7	4.7
PM-9	Flow (gpm) ⁽¹⁾	16.8	25.7	21
PM-10	Flow (gpm) ⁽¹⁾	10.1	8.3	8.7
PM-11	Flow (gpm) ⁽¹⁾	10.4	10.6	9.9
PM-12	Flow (gpm) ⁽¹⁾	9.5	11.6	10.4
PM-13	Flow (gpm) ^{(1),(2)}	20.8	24.8	12.4

Notes:

- (1) Flow rates are intermittent. Total flows are not available because the flow indicators are not equipped with totalizers.
- (2) The fourth pump, which is common to all three cells, discharged to cell #1 during this three-month period.

NM - No measurement was taken

TABLE 2
VOLATILE ORGANIC COMPOUNDS (VOCs)
SUMMARY OF ANALYTICAL RESULTS
FROM GROUNDWATER TREATMENT SYSTEM

		CONCENTRATION ($\mu\text{g/l}$)	CONCENTRATION ($\mu\text{g/l}$)	CONCENTRATION ($\mu\text{g/l}$)
	Discharge Criteria,	October 1999	November 1999	December 1999
Contaminant		20 th	16 th	15 th
	($\mu\text{g/l}$)	I : E	I : E	I : E
Vinyl Chloride	50	110:ND	ND:ND	ND:ND
1,2 Dichloroethene	30	58:ND	3B:ND	2:ND
Benzene	10	3:ND	2B:ND	0.9:ND
Chlorobenzene	10	3:ND	2B:ND	1B:ND
Chloroethane	20	3:ND	3B:ND	2:ND
Ethylbenzene	10	0.8:ND	0.4B:ND	0.07B:ND
Toluene	10	0.5:ND	0.5B:0.08B	0.2B:ND
Total Xylenes	10	7:ND	3B:0.1B	0.3B:ND
Methylene Chloride	50	0.3B:0.2B	0.4B:0.2B	0.3B:0.1B
1,1 Dichloroethane	30	0.6:ND	ND:ND	0.5:ND
Methyl Ethylketone	NV	ND:ND	ND:ND	7:ND

I = Influent E = Effluent ND = Not Detected NA = Not Analyzed NV = No discharge criteria
has been established

B = Blank Contamination

Only detected analytes are included.

Shaded area indicates result exceeds standard.

**TABLE 3 – METALS
SUMMARY OF ANALYTICAL RESULTS
FROM GROUNDWATER TREATMENT SYSTEM**

		CONCENTRATION ($\mu\text{g/l}$)	CONCENTRATION ($\mu\text{g/l}$)	CONCENTRATION ($\mu\text{g/l}$)
	Discharge Criteria ($\mu\text{g/l}$)	October 1999	November 1999	December 1999
Contaminant		20 th	16 th	15 th
		I : E	I : E	I : E
Barium	3500	98:46	99:56	95:67
Calcium	NV	115*:92*	120*:96.4*	114*:103*
Cobalt	5	7:ND	9:ND	7:ND
Iron	300	30.6*:39	35.3*:82	34.2*:81
Magnesium	NV	31*:26.4*	34.1*:27.2*	31.1*:29.1*
Manganese	NV	2.9*:11	2.9*:27	2.8*:7
Nickel	9.6	7:5	5:7	ND:5
Potassium	NV	6.6*:5.6*	5.6*:8.4*	6.3*:9*
Sodium	NV	54.2*:38.4*	55.7*:44.1*	56.7*:41.9*
Zinc	170	ND:ND	ND:17	15:30

I = Influent E = Effluent ND = Not Detected NA = Not Analyzed NV = No discharge criteria
has been established

* = Multiply by 1,000

B = Blank Contamination

Only detected analytes are included.

Shaded area indicates result exceeds standard.

TABLE 4
SUMMARY OF ADDITIONAL ANALYTICAL RESULTS
FROM GROUNDWATER TREATMENT SYSTEM

		CONCENTRATION (mg/l)	CONCENTRATION (mg/l)	CONCENTRATION (mg/l)
	Discharge Criteria	October 1999	November 1999	December 1999
Contaminant		20 th	16 th	15 th
		E	E	E
Total Dissolved Solids	500 mg/l	501	541	564
Total Suspended Solids	50 mg/l	ND	ND	ND
Total Phenols	0.008 mg/l	ND	.004	.003
pH	6.0 - 9.0	7.8	7.5	NA

I = Influent E = Effluent ND = Not Detected NA = Not Analyzed NV = No discharge criteria
has been established

B = Blank Contamination

Only detected analytes are included.

Shaded area indicates result exceeds standard.

It is significant to note that two parameters (cobalt and iron) that exceeded discharge criteria in the previous report were not detected above the criteria in this report.

In general, effluent quality has significantly improved based on data from this report.

4.0 GROUNDWATER MONITORING

Samples are scheduled to be collected and analyzed from the network of groundwater monitoring wells twice per year (Figure 2). Samples were collected on October 21, 1999 during this reporting period. These samples were analyzed for target compound list (TCL) volatile organic compounds (VOCs) by NYSDEC ASP Method 95-1, site-specific target analyte list (TAL) Metals by NYSDEC ASP Methods CLP-M and various wet chemistry parameters. Chemicals detected in the samples from the groundwater monitoring wells are summarized in Table 5. For comparison, the groundwater monitoring well data from May 1999 has also been included. Analytical results are presented in Appendix A.

During this operating period, the established groundwater criteria for eight analytical parameters were exceeded in one or more sampling locations. These parameters were benzene, chlorobenzene, arsenic, cadmium, iron, magnesium, manganese and sodium. A summary is provided below.

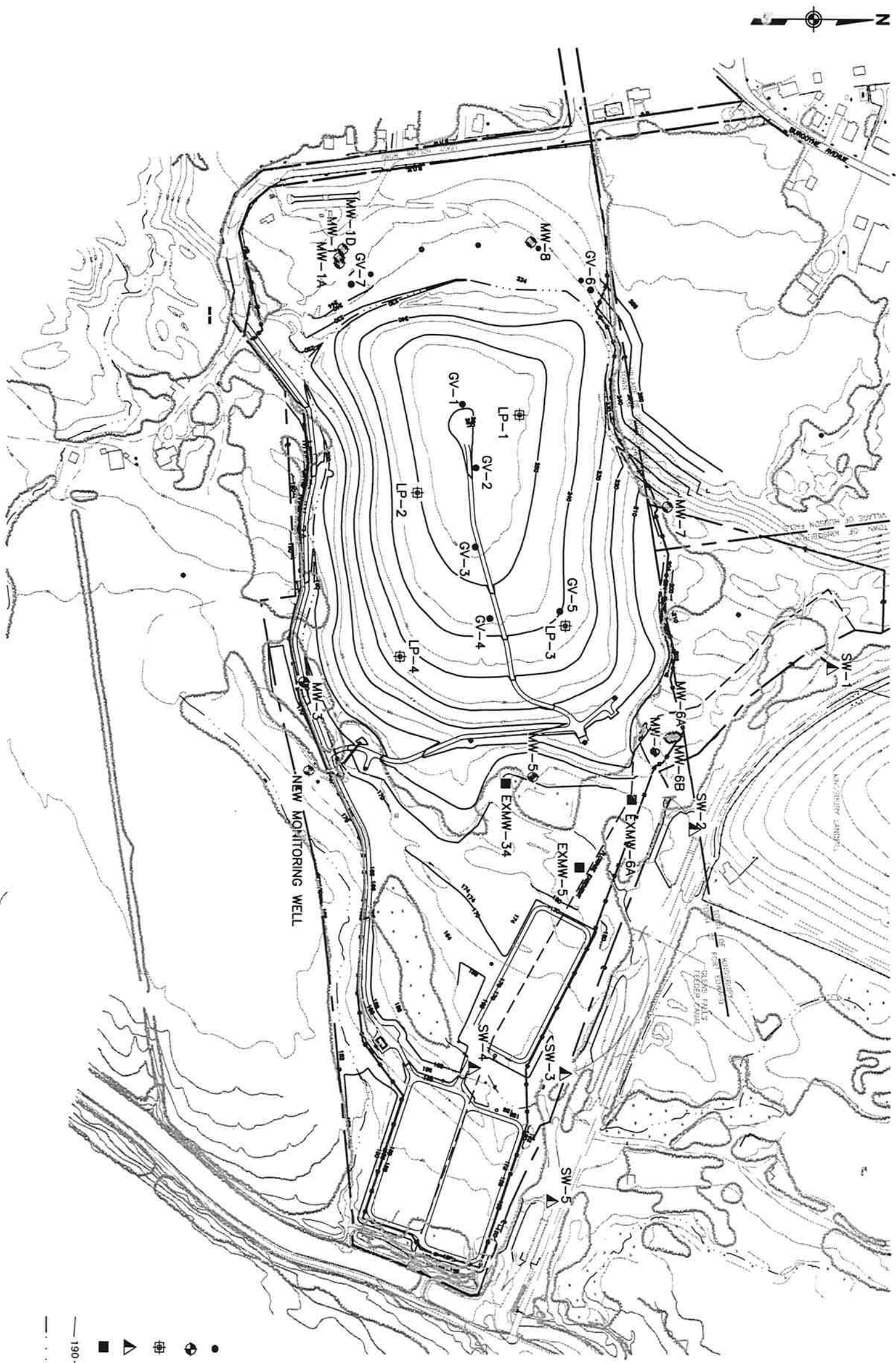
Benzene: Benzene exceeded the groundwater criterion (1 µg/l) in MW-01D, MW-06 and MW-06A.

Chlorobenzene: Chlorobenzene exceeded the groundwater criterion (5 µg/l) in MW-06.

Arsenic: Arsenic exceeded the groundwater criterion (25 µg/l) in MW-06.

Cadmium: Cadmium exceeded the groundwater criterion (5 µg/l) in MW-06 and MW-07

Iron: Iron exceeded the groundwater criterion (300 µg/l) in ten of the eleven monitoring wells.



NOTE:
 BASE MAPPING FOR THIS DRAWING WAS TAKEN FROM DRAWING NO.5, FINAL SITE PLAN, OF THE
 FORT EDWARD LANDFILL REMEDIAL ACTION RECORD DRAWINGS, ISSUED SEPTEMBER 1999.



- LEGEND**
- GAS MONITORING WELL
 - ⊕ MONITORING WELL
 - ⊕ LANDFILL PIEZOMETER
 - ▲ SURFACE WATER SAMPLING LOCATION
 - EXISTING MONITORING WELL
 - 190 — TOPOGRAPHIC CONTOUR
 - — — STREAM/DRAINAGE CHANNEL/POND

GROUNDWATER, SURFACE WATER, AND
 GAS MONITORING LOCATIONS

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FIGURE 2

TABLE 5 (October 1999)
SUMMARY OF ANALYTICAL RESULTS
FROM GROUNDWATER MONITORING WELLS

Concentration (µg/l)																						
Contaminant	NYSDEC Groundwater Standards*	MW-01		MW-01A		MW-01D		MW-02		MW-02A		MW-06		MW-06A		MW-06B		MW-07		MW-08		NW
		May '99	Oct '99	May '99	Oct '99	May '99	Oct '99	May '99	Oct '99	May '99	Oct '99	May '99	Oct '99	May '99	Oct '99	May '99	Oct '99	May '99	Oct '99	May '99	Oct '99	Oct '99
Acetone	50	ND	ND	ND	ND	ND	ND	8	ND	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	1	ND	ND	ND	ND	ND	9	ND	ND	ND	ND	2	4	ND	2	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	24	34	ND	1	ND	ND	ND	ND	ND	ND	ND
Chloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4	ND	ND	ND	ND	ND	5	ND	ND	ND	ND
Methylene Chloride	5	ND	ND	ND	ND	ND	ND	2	ND	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	3	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aluminum	NV	47.7	140	951	1500	3230	140	329	320	264	430	261	420	209	200	ND	920	176	190	841	430	630
Antimony	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.9	ND	ND	ND	ND
Arsenic	25	ND	ND	8.7	ND	ND	ND	ND	ND	ND	ND	17.7	40	ND	ND	6	ND	ND	ND	ND	ND	ND
Barium	1000	32.1	ND	20.5	ND	888	780	74.7	ND	92.4	ND	210	160	127	160	491	ND	27.9	ND	28.1	ND	ND
Cadmium	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.2	18	ND	ND	83.4	ND	0.45	24	ND	ND	ND
Calcium	NV	41800	39000	12300	16000	25600	13000	103000	120000	61200	67000	111000	80000	108000	110000	ND	9800	89900	92000	35100	43000	64000
Chromium	50	2.3	ND	3	ND	5.8	ND	4.2	ND	3.1	ND	1.7	ND	0.96	ND	52.4	ND	1.8	ND	2.4	ND	ND

Only detected analytes are included. ND = Not Detected NV = No Criteria Established NA = Not Analyzed B = Blank Contamination

* New York State Department of Environmental Conservation, June 1998
 Division of Water Technical and Operational Guidance Series (1.1.1)

Shaded area indicates result exceeds standard.