QUARTERLY OPERATING REPORT
APRIL-JUNE 1999

WORK ASSIGNMENT D003825-1

FORT EDWARD LANDFILL
FORT EDWARD (T)

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

Prepared for:
NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
50 Wolf Road, Albany, New York

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DIVISION OF ENVIRONMENTAL REMEDIATION

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QUARTERLY REPORT OF OPERATIONS

APRIL 1 TO JUNE 30, 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:
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The air stripper was installed to remove volatile organic compounds (VOCs) from the water. During the start-up period, the concentrations of VOCs in the influent were below the discharge criteria, therefore the air stripper was not needed. As a result, the air stripper was bypassed in the treatment system on October 29, 1998 and is not currently being used.

1.0 INTRODUCTION

This report summarizes the long-term operation and maintenance (O&M) activities at the Fort Edward Landfill for the period from April 1 to June 30, 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.

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.

CORRECTION

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, therefore was bypassed in the treatment system on October 29, 1998 and 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.

Mitkem 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 URSGWC utilize the New York State Department of Health (NYSDOH) laboratory for all analytical services after June 1, 1999.

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 includes water sampling and analysis at seven (7) locations (Figure 1). The analytical results are utilized to evaluate the progress of the remediation at the site.

Water samples were collected from the treatment system influent (SL-1 on Figure 1) and effluent (SL-6 on Figure 1). The samples were collected on April 8, 14, 21, 28 and May 5, 12, 20 and 25, 1999. 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 and effluent 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 criteria for seven analytical parameters were exceeded in one or more sampling events at the point of compliance (polishing pond effluent). These parameters were cobalt, iron, lead, nickel, total dissolved solids, total suspended solids, and total phenols. Data for these seven parameters are presented in Tables 3 and 4. A summary is provided below.

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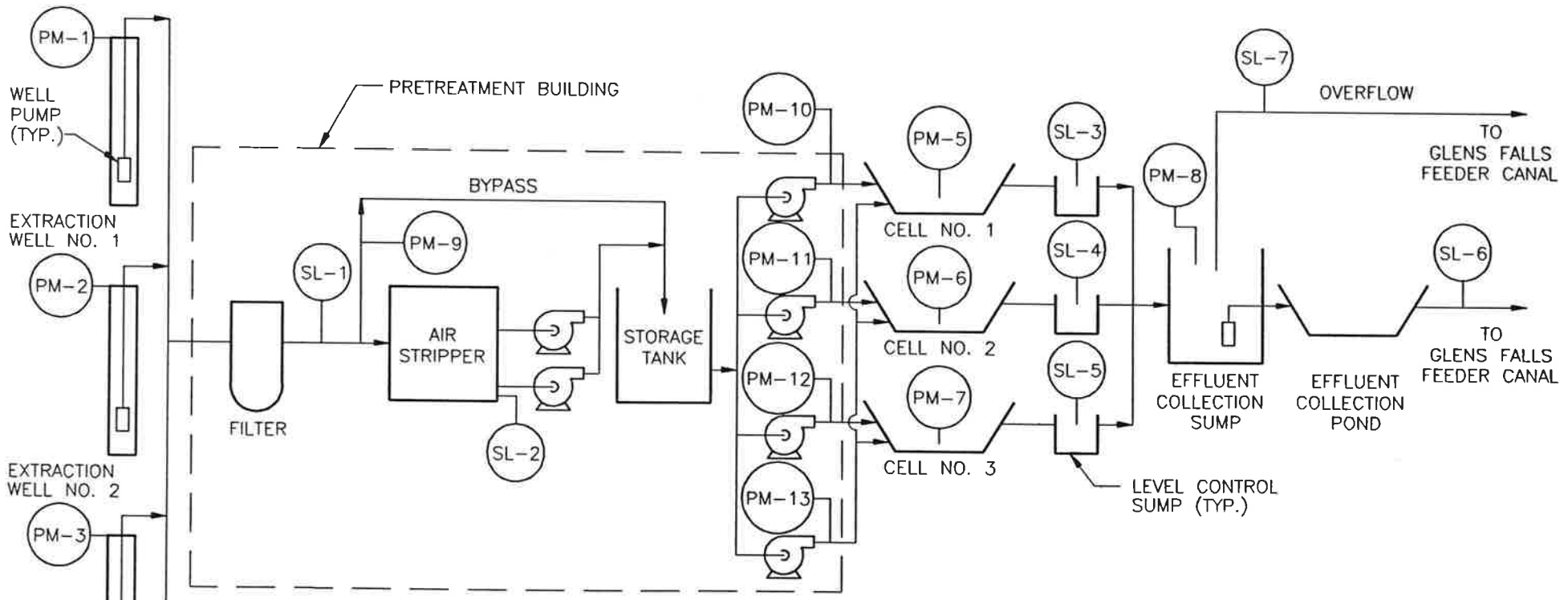

PROCESS MONITORING LOCATION KEY

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

URS CONSULTANTS, INC.

SAMPLE AND PROCESS MONITORING LOCATIONS

FIGURE 1

TABLE 1
PROCESS MONITORING SUMMARY

MONITORING LOCATION	PARAMETER	APRIL 1999	MAY 1999	JUNE 1999
PM-1	Level (ft of H_2O)	4.8	5.7 – 11.4	4.3 – 7.1
PM-2	Level (ft of H_2O)	10.6	7.4 – 10.2	7.4 – 18.0
PM-3	Level (ft of H_2O) [(1)]	---	7.9 – 10.4	6.8 – 10.0
PM-4	Level (ft of H_2O) [(1)]	---	0.98 – 4.8	4.8
PM-5	Level (ft of H_2O)	1.96 – 2.11	1.9 – 2.1	1.8 – 2.2
PM-6	Level (ft of H_2O)	1.82 – 1.89	1.8 – 1.9	1.8 – 2.25
PM-7	Level (ft of H_2O)	1.71 – 1.79	1.5 – 1.96	1.8 – 2.25
PM-8	Level (ft of H_2O)	4.75	4.7	4.75 – 5.1
PM-9	Flow (gpm)	41.1	27.1 - 31.6	20.1 - 25.5
PM-10	Flow (gpm) [(2)]	17.5	0 - 15.5	11.6 – 15.7
PM-11	Flow (gpm) [(2)]	13.0	7.5 - 12.9	10.4 - 20.1
PM-12	Flow (gpm) [(2)]	7.1	9.7 - 11.8	6.8 - 15.5
PM-13	Flow (gpm) [(2),(3)]	14.1	6.3 – 8.9	11.0 – 20.3

Notes:

(1) No data was taken at PM-3 and PM-4 during the month of April.

(2) Flow rates are intermittent. Total flows are not available because the flow indicators are not equipped with totalizers.

(3) The fourth pump, which is common to all three cells, discharged to cell #1 during this three-month period.

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

Contaminant	Discharge Criteria, (µg/l)	CONCENTRATION, (µg/l) April, 1999				CONCENTRATION, (µg/l) May, 1999				(µg/l) June, 1999
		8th	14th	21st	28th	5th	12th	20th	25th	2nd
		I : E	I : E	I : E	I : E	I : E	I : E	I : E	I : E	Effluent
Vinyl Chloride	50	5 : ND	10 : ND	4 : ND	1 : ND	19 : ND	8 : ND	ND : ND	ND : ND	ND
1,2 Dichloroethene	30	4 : ND	8 : ND	5 : ND	2 : 1	22 : ND	6 : 1	ND : ND	2 : ND	ND
Acetone	NV	ND : 15	ND : 23	ND: ND	ND : ND	ND : ND	ND : ND	ND : ND	ND : ND	ND
Bromodichloromethane	30	ND : 4	ND : ND	ND : ND	ND : ND	ND : ND	ND : ND	ND : ND	ND : ND	ND
Benzene	10	2 : ND	4 : ND	4 : ND	2 : ND	8 : ND	2 : 1	ND : ND	1 : ND	ND
Chlorobenzene	10	ND : ND	2 : ND	2 : ND	ND : ND	4 : ND	2 : ND	1 : ND	ND : ND	0.08
Chloroethane	20	4 : ND	ND : ND	2 : ND	3 : 1	1 : ND	2 : ND	2 : ND	2 : ND	ND
Chloroform	150	ND : 33	ND : ND	ND : ND	ND : ND	ND : ND	ND : ND	ND : ND	ND : ND	ND
Ethylbenzene	10	1 : ND	2 : ND	1 : ND	ND : ND	7 : ND	1 : ND	ND : ND	ND : ND	0.2
Toluene	10	ND : ND	9 : ND	4 : ND	2 : ND	**14** : 1	1 : 1	ND : ND	ND : ND	0.2
Total Xylenes	10	5 : ND	**13** : ND	7 : ND	3 : ND	**33** : ND	4 : ND	ND : ND	ND : ND	0.8
Trichloroethene	NV	ND : 13	ND : ND	ND : ND	2 : ND	ND : ND	2 : ND	ND : ND	2 : ND	ND

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

Only detected analytes are included.

Bold type indicates result exceeds standard..

TABLE 3 - METALS
SUMMARY OF ANALYTICAL RESULTS
FROM GROUNDWATER TREATMENT SYSTEM

Contaminant	Discharge Criteria, (µg/l)	CONCENTRATION, (µg/l) April, 1999				CONCENTRATION, (µg/l) May, 1999				(µg/l) June, 1999
		8th	14th	21st	28th	5th	12th	20th	25th	2nd
		I : E	I : E	I : E	I : E	I : E	I : E	I : E	I : E	Effluent
Aluminum	NV	NA : NA	NA : 88.8	ND : 14.9	31.5 : 24.9	ND : ND	ND : ND	ND : 30.9	ND : 43.6	32
Antimony	NV	NA : NA	NA : ND	ND : 1.9	ND : ND	ND : ND	ND : ND	ND : 20.8	ND : ND	ND
Arsenic	150	ND : ND	ND : ND	8.8 : 3.9	6.3 : 3.2	13.9 : 10.6	16.2 : 6.5	9.3 : ND	4.2 : ND	ND
Barium	3500	116 : 54.3	122 : 152	139 : 157	117 : 160	202 : 166	196 : 161	114 : 49.6	117 : 50.8	25
Cadmium	1	**1.1** : ND	0.8 : 0.42	**1.1** : ND	0.8 : ND	**2.9** : 0.36	**3.1** : 0.71	ND : ND	ND : ND	ND
Calcium	NV	NA : NA	NA : 124*	130*: 125*	113*: 123*	124*: 118*	120*: 116*	116*: 88.1*	116*: 103*	83.7
Chromium	210	ND : 1.2	0.96 : 1.2	1.9 : 1.5	2.9 : 3.0	2.2 : 0.92	3.8 : 1.2	ND : 1.2	1.4 : 1.1	ND
Cobalt	5	**11** : 3.0	**11 : 14.1**	**13.7 : 15**	**14.6 : 13.8**	**16.6 : 15.2**	**16.5 : 14.4**	**11.1** : 1.9	**10.9** : 3.8	ND
Copper	24	ND : 7.9	ND: ND	ND : ND	0.89 : ND	ND : ND	ND : ND	ND : 1.4	ND : 2.2	ND

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

* = Multiply by 1,000

Only detected analytes are included.

Bold type indicates result exceeds standard.

TABLE 3 – METALS (Continued)
SUMMARY OF ANALYTICAL RESULTS
FROM GROUNDWATER TREATMENT SYSTEM

Contaminant	Discharge Criteria, (µg/l)	CONCENTRATION, (µg/l) April, 1999				CONCENTRATION, (µg/l) May, 1999				(µg/l) June, 1999
		8th	14th	21st	28th	5th	12th	20th	25th	2nd
		I : E	I : E	I : E	I : E	I : E	I : E	I : E	I : E	Effluent
Iron	300	**38.6*: 5.4***	**29.5* : 20.2***	**34.8*: 17.2***	**20*: 19.4***	**46.9*: 19.1***	**53.8*: 24.4***	**35.9*: 520**	**34.9*: 529**	**389**
Lead	3.2	**16.3 : 11.4**	**7.4 : 7.7**	**9.1 : 7.1**	**8.1 : 7.3**	**8.9 : 7.5**	**10.9 : 9.6**	**7.4 : 5.2**	**9.8 : 8.1**	ND
Magnesium	NV	NA : NA	NA : 32.5*	38.4*: 34*	35.1* : 35.9*	41.3*: 32.8*	37.6*: 33.6*	33.6*: 35.8*	36*: 35.1*	31.7
Manganese	NV	NA : NA	NA : 2.62*	3.55*: 2.64*	3.29*: 2.58*	2.83* : 2.28*	3.12* : 2.77*	3.48*: 445	3.46*: 507	1480
Nickel	9.6	4.6 : 4.8	6.8 : **16.4**	**10.6 : 17.6**	**10.0 : 15.5**	**13.1 : 17.9**	**12.4 : 13.9**	5.4 : 9.1	5.9 : **11.4**	**11**
Potassium	NV	NA : NA	NA : 8800	9750 : 9260	6920 : 8340	18.8*: 9760	15.4*: 7870	6090 : 6570	5780: 6400	4.8
Silver	NV	NA : NA	NA : 18.1	4.5 : 3.1	6.2 : 3.3	6.3 : 4.7	7.6 : 3.9	4.2 : 3.9	1.8 : 2.7	ND
Sodium	NV	NA : NA	NA : 53*	68.6*: 55.9*	57.2* : 57.4*	91.7*: 55.4*	79.9*: 53.1*	59.9*: 49.3*	59.1*: 57.3*	56.1
Thallium	NV	NA : NA	NA : ND	ND : ND	ND : ND	3.3 : ND	3.1 : ND	3.3 : ND	ND : ND	ND
Vanadium	14	2.6 : ND	ND : 2.3	2.8 : 2.2	4.5 : 1.7	8.0 : 3.7	9.1 : 2.2	2.0 : ND	ND : ND	ND
Zinc	170	5.5 : 63.6	58.4 : 11.6	47 : 9.3	15.8 : ND	27.3 : 23.1	45.7 : 62.9	27.2 : 40	31.6 : 42.5	53

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

* = Multiply by 1,000

Only detected analytes are included.

Bold type indicates result exceeds standard.

TABLE 4
SUMMARY OF ADDITIONAL ANALYTICAL RESULTS
FROM GROUNDWATER TREATMENT SYSTEM

Contaminant	Discharge Criteria,	CONCENTRATION, (mg/l) April, 1999				CONCENTRATION, (mg/l) May, 1999				(mg/l) June, 1999
		8th	14th	21st	28th	5th	12th	20th	25th	2nd
		E	E	E	E	E	E	E	E	E
Total Dissolved Solids	500 mg/l	420	**670**	700	**730**	340	**730**	**550**	**620**	**580**
Total Suspended Solids	50 mg/l	**74**	**68**	49	ND	50	41	ND	ND	4
Total Phenols	0.008 mg/l	ND	NA	ND	ND	ND	ND	ND	ND	**0.009**
PH	6.0 – 9.0	7.1	6.9	6.8	6.8	6.8	7.0	7.9	7.7	7.4

E = Effluent NA = Not Analyzed ND = Not Detected

Bold type indicates result exceeds standard.

Cobalt: Cobalt exceeded the discharge criterion (5 µg/l) in the five samples collected from April 14 to May 12, 1999. The three most recent samples (May 20, 25 and June 2, 1999) were in compliance.

Iron: Iron exceeded the discharge criterion (300 µg/l) in all nine samples collected between April 8 and June 2, 1999.

Lead: Lead exceeded the discharge criterion (3.2 µg/l) in eight of the nine samples collected between April 8 and June 2, 1999. The most recent sample, from June 2, 1999, was in compliance.

Nickel: Nickel exceeded the discharge criterion (9.6 µg/l) in seven of the last eight samples collected from April 14 to June 2, 1999 (including the two most recent samples collected on May 25 and June 2).

Total Dissolved Solids (TDS): TDS exceeded the discharge criterion (500 mg/l) in seven of the last nine samples collected from April 8 to June 2, 1999 (including the four most recent samples collected on May 12, 20, 25 and June 2, 1999).

Total Suspended Solids (TSS): TSS exceeded the discharge criterion (50 mg/l) in two samples collected on April 8 and 14, 1999. TSS have been in compliance (below the discharge criterion) for the last seven samples collected from April 21 to June 2, 1999.

Total Phenols: Total phenols were not detected in seven of the nine samples collected from April 8 to June 2, 1999. The April 14, 1999 sample was not analyzed for total phenols and the most recent sample, June 2, 1999, exceeded the discharge criterion (0.008 mg/l).

During the reporting period, the following trends were observed (Tables 3 and 4) for the seven parameters discussed above.

- The concentrations of cobalt and iron in the effluent decreased significantly.
- The concentrations of lead and nickel remained relatively constant.
- TDS concentrations fluctuated sporadically throughout the operating period.
- TSS concentrations decreased at the end of the operating period.
- Total phenols exceeded the discharge criterion in only one effluent sample.

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 May 5 and 6 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. Analytical results are presented in Appendix A.

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

Chromium: Chromium exceeded the groundwater criterion (50 µg/l) in MW-06B.

Iron: Iron exceeded the groundwater criterion (300 µg/l) in all seven monitoring wells.

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

Magnesium: Magnesium exceeded the groundwater criterion (35,000 µg/l) in MW-06 and MW-06A.