ARCADIS Design & Consultancy for natural and built assets

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Subject:
August 2017 Monthly Report
Site Management/RSO
Fort Edward Landfill
NYSDEC Site No. 558001
Contract No. D007618-39

Date:
September 19, 2017

Contact:
Andy Vitolins

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Our ref:
00266434.0000

Dear Mr. Long:

Arcadis CE, Inc. (Arcadis) has prepared this letter report to summarize the leachate collection and treatment system operation, maintenance, and monitoring (OM&M) activities completed during the August 2017 reporting period.

Leachate Collection and Treatment System Operation and Maintenance

The leachate collection system operated with no downtime during the August 2017 operating period. A total of 489,385 gallons of leachate were collected and treated through the system during August 2017. The corresponding average leachate recovery rate for the month was approximately 11.0 gallons per minute (gpm).

The following O&M activities were completed during the August 2017 operating period:

- Iron and solids sludge processing was performed throughout the month. In total, four 55-gallon drums of sludge were generated during August 2017.
- Brush cutting was performed in select areas of the landfill cap swales.
- The pump in extraction well EW-4 was removed, cleaned, and replaced on August 29, 2017 due to a reduction in flow.
- ARIES chemical was on-site on August 21, 2017 to temporarily implement chemical adjustments to the current sludge processing. Flocculant was added to the Thickener tank sludge before being pumped to the Filter Press.

The addition of flocculant produced thicker dry Filter Sludge cakes and will continue in September to evaluate the effectiveness of this implementation.

System Sampling

The monthly samples were collected on August 29, 2017 from the following locations:

- Treatment System Influent (i.e. combined flow from extraction wells EW-1, EW-2, EW-3, and EW-4);
- Clarifier Catch Tank discharge;
- Cell 3 (i.e. treatment cell discharge into the Cell 2/3 bypass pipe);
- Cell 2 (i.e. treatment cell discharge into the effluent collection chamber); and
- Polishing Pond Effluent.

Extraction wells EW-1, EW-2, EW-3, and EW-4 were not sampled this month as they were sampled in July 2017 as part of the annual monitoring event. The extraction wells will be sampled again in fourth quarter 2017.

The monthly routine samples were submitted to Con-Test Analytical for analysis of volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), metals, total dissolved solids (TDS), and total suspended solids (TSS).

The analytical results are discussed in the sections below and have been summarized in Table 1. The laboratory analytical data will be submitted to NYSDEC's EIMS Administrator in the required EQuIS EDD format.

Analytical Results

VOCs

As shown in Table 1, VOCs were detected in the Influent, Clarifier Catch Tank discharge, Cell 3 bypass, and Cell 2 effluent at concentrations that exceeded the NYSDEC Class GA Groundwater Standards. Influent, Clarifier Catch Tank discharge, and Cell 3 bypass contained two VOCs, and Cell 2 effluent contained one VOC greater than the respective NYSDEC Standards. The sample from combined influent to the treatment system (Influent) contained cis-1,2-dichloroethene (cDCE) (11 micrograms per liter [µg/L]) and vinyl chloride (5.2 µg/L). These compounds were also present in the treatment plant discharge (Clarifier Catch), and Cell 3 bypass at concentrations that exceeded the NYSDEC Class GA Groundwater Standards. As shown in Table 1, the Clarifier Catch sample concentrations of cDCE and vinyl chloride were 17 µg/L and 14 µg/L, respectively; the Cell 3 bypass sample concentrations of cDCE and vinyl chloride were 7.0 µg/L and 2.5 µg/L, respectively. As shown in Table 1, no VOCs were detected at concentrations greater than the respective quantitation limits in the Effluent sample from the Polishing Pond.

PCBs

PCB-1242 was the only PCB Aroclor detected in the samples collected from Influent, Clarifier Catch Tank, and Cell 3 bypass at concentrations greater than the NYSDEC Class GA Groundwater Standard. PCBs were not detected in the effluent collection chamber samples at Cell 2 or the Polishing Pond Effluent

sample during the August 2017 sampling event (Table 1). During monthly sampling events since July 2016, PCB Aroclor 1016, 1221, or 1232 have generally been detected in the Influent or Clarifier Catch Tank samples.

Metals

Iron and manganese were detected at all the sample locations at concentrations greater than the corresponding NYSDEC Class GA Groundwater Standard and Effluent Limitation of 0.3 mg/L and 0.6 mg/L, respectively. The highest concentration of iron and manganese was detected in the sample from the Clarifier Catch tank discharge and Effluent at 13 mg/L and 2.7 mg/L, respectively. As shown in Table 1, the Effluent samples also contained iron and manganese concentrations (4.0 mg/L and 2.7 mg/L, respectively) above the respective NYSDEC Class GA Groundwater Standard and/or Effluent Limitations. Table 1 also shows that the concentration of iron decreased by an order of magnitude after being discharged from the treatment plant and flowing through the treatment cells. Iron concentrations from the Influent and Clarifier Catch tank samples were similar this sampling event due to a decrease in chemical pump feed from the bleach (oxidant) drum. Although bleach was reintroduced to the Treatment System prior to sampling, the residence time within the Inclined Plate Clarifier (IPC) was not long enough for a quantitative reduction in iron.

TDS and TSS

The concentrations of TDS and TSS continue to fluctuate between sampling events. During the August sampling event, TDS concentrations ranged between 420 mg/L and 590 mg/L; TSS concentrations ranged from 16 mg/L and 100 mg/L. These data are consistent with the results from previous sampling events. Since September 2016, TDS and TSS have ranged from 210 to 1,300 mg/L and 0 to 120 mg/L, respectively.

Next Reporting Period Planned Activities

The following activities are anticipated for September 2017:

- Brush cutting and clearing along the landfill drainage swales, the perimeter of the treatment cells, and near well vaults and other structures;
- Continued dewatering and monitoring of Unnamed Pond; and
- Continuation of iron and solids treatment and processing;

If you have any questions, please do not hesitate to contact me or Jeremy Wyckoff.

Sincerely,

Arcadis CE, Inc.

Andy Vitolins
Associate Vice President, P.G.

Copies:

Jeremy Wyckoff, Arcadis
File

Enclosures:
Table
1 August Treatment System Analytical Data

Table 1. August Treatment System Analytical Data, Fort Edward Landfill
Fort Edward, New York. NYSDEC Site No. 558001

Chemical Name	NYSDEC Class GA GW Standard	NYSDEC Class GA GW Effluent Limitation	INFLUENT 8/29/2017	CLARIFIER CATCH 8/29/2017	CELL 3 8/29/2017	CELL 2 8/29/2017	EFFLUENT 8/29/2017
Volatile Organic Compounds (ug/L)							
ACETONE	50	50	16 J	50 U	50 U	50 U	50 U
BENZENE	1	1	0.34 J	0.63 J	1.00 U	1.00 U	1.00 U
BROMOCHLOROMETHANE	5	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
BROMODICHLOROMETHANE	50	50	2.6	0.5 U	0.5 U	0.5 U	0.5 U
BROMOFORM	50	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
BROMOMETHANE	5	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
2-BUTANONE (MEK)	50	50	6.6 J	20.0 U	20.0 U	20.0 U	20.0 U
CARBON DISULFIDE	60	60	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U
CARBON TETRACHLORIDE	5	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
CHLOROBENZENE	5	5	0.57 J	1.10	0.16 J	1.00 U	1.00 U
CHLORODIBROMOMETHANE	50	--	0.24 J	0.50 U	0.50 U	0.50 U	0.50 U
CHLOROETHANE	5	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
CYCLOHEXANE	--	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,2-DIBROMO-3-CHLOROPROPANE	0.04	0.04	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	0.0006	0.0006	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROBENZENE	3	3	1.0 U	1.0 U	1.00 U	1.0 U	1.0 U
1,3-DICHLOROBENZENE	3	3	1.0 U	1.0 U	1.00 U	1.0 U	1.0 U
1,4-DICHLOROBENZENE	3	3	0.15 J	0.27 J	1.00 U	1.00 U	1.00 U
DICHLORODIFLUOROMETHANE	5	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,1-DICHLOROETHANE	5	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
CIS-1,2-DICHLOROETHYLENE	5	5	**11.0**	**17.0**	**7.0**	**5.5**	1.0 U
TRANS-1,2-DICHLOROETHYLENE	5	5	0.16 J	0.33 J	1.00 U	1.00 U	1.00 U
1,2-DICHLOROETHANE	0.6	0.6	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-DICHLOROETHYLENE	5	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-DICHLOROPROPANE	1	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
CIS-1,3-DICHLOROPROPENE	0.4	0.4	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRANS-1,3-DICHLOROPROPENE	0.4	0.4	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,4-DIOXANE	--	--	50 U	50 U	50 U	50 U	50 U
ETHYLBENZENE	5	5	1.00 U	0.18 J	1.00 U	1.00 U	1.00 U
2-HEXANONE	50	50	10 U	10 U	10 U	10 U	10 U
ISOPROPYLBENZENE (CUMENE)	5	5	1.00 U	0.16 J	1.00 U	1.00 U	1.00 U
METHYL ACETATE	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
METHYL TERT-BUTYL ETHER (MTBE)	10	10	1.00 U	0.12 J	1.00 U	1.00 U	1.00 U
METHYL CYCLOHEXANE	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
METHYLENE CHLORIDE	5	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	--	--	10 U	10 U	10 U	10 U	10 U
STYRENE	5	930	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,1,2-TETRACHLOROETHANE	5	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TETRACHLOROETHYLENE (PCE)	5	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TOLUENE	5	5	0.18 J	0.34 J	1.00 U	1.00 U	1.00 U
1,2,3-TRICHLOROBENZENE	5	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,2,4-TRICHLOROBENZENE	5	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,1-TRICHLOROETHANE	5	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-TRICHLOROETHANE	1	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TRICHLOROETHYLENE (TCE)	5	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TRICHLOROFLUOROMETHANE	5	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	5	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
VINYL CHLORIDE	2	2	**5.2**	**14.0**	**2.5**	1.6 J	2.0 U
M,P-XYLENES	5	5	0.35 J	0.71 J	2.00 U	2.00 U	2.00 U
O-XYLENE (1,2-DIMETHYLBENZENE)	5	5	0.14 J	0.19 J	1.00 U	1.00 U	1.00 U
XYLENES, TOTAL	5	5	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U

Notes:
Constitutents detected above the NYSDEC Class GA GW Standard are in **bold**.
Constitutents detected above the NYSDEC Class GA GW Effluent Limitation are highlighted in yellow.

Definitions:
NYSDEC Class GA GW Standard - New York State Department of Environmental Conservation Groundwater Standard and Guidance Value.
NYSDEC Class GA GW Effluent Limitation - New York State Department of Environmental Conservation Effluent Limitation.
U - The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
J - The concentration is an approximate value.
mg/L - milligrams per liter
ug/L - micrograms per liter
NS - Not Sampled

Table 1. August Treatment System Analytical Data, Fort Edward Landfill
Fort Edward, New York. NYSDEC Site No. 558001

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Chemical Name	NYSDEC Class GA GW Standard	NYSDEC Class GA GW Effluent Limitation	INFLUENT 8/29/2017	CLARIFIER CATCH 8/29/2017	CELL 3 8/29/2017	CELL 2 8/29/2017	EFFLUENT 8/29/2017
Polychlorinated Biphenyls (ug/L)							
PCB-1016 (AROCLOR 1016)	*	*	2.0 U	4.0 U	0.2 U	0.2 U	0.2 U
PCB-1221 (AROCLOR 1221)	*	*	2.0 U	4.0 U	0.2 U	0.2 U	0.2 U
PCB-1232 (AROCLOR 1232)	*	*	2.0 U	4.0 U	0.2 U	0.2 U	0.2 U
PCB-1242 (AROCLOR 1242)	*	*	**8.5**	**20.0**	**1.1**	0.2 U	0.2 U
PCB-1248 (AROCLOR 1248)	*	*	2.0 U	4.0 U	0.2 U	0.2 U	0.2 U
PCB-1254 (AROCLOR 1254)	*	*	2.0 U	4.0 U	0.2 U	0.2 U	0.2 U
PCB-1260 (AROCLOR 1260)	*	*	2.0 U	4.0 U	0.2 U	0.2 U	0.2 U
PCB-1262 (AROCLOR 1262)	*	*	2.0 U	4.0 U	0.2 U	0.2 U	0.2 U
PCB-1268 (AROCLOR 1268)	*	*	2.0 U	4.0 U	0.2 U	0.2 U	0.2 U
Metals (mg/L)							
ALUMINUM	--	2	13.000	0.730	0.091	0.056	0.120
ANTIMONY	0.003	0.006	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
ARSENIC	0.025	0.05	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
BARIUM	1	2	0.110	0.063	0.083	0.077	0.050 U
BERYLLIUM	0.003	0.003	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
CADMIUM	0.005	0.01	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
CALCIUM	--	--	98	91	110	110	86
CHROMIUM, TOTAL	0.05	0.1	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
COBALT	--	--	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
COPPER	0.2	1	0.01 U	0.018	0.01 U	0.01 U	0.01 U
IRON	0.3	0.6	**12.0**	**13.0**	**6.4**	**10.0**	**4.0**
LEAD	0.025	0.05	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
MAGNESIUM	35	35	25	25	25	23	26
MANGANESE	0.3	0.6	**2.1**	**1.8**	**1.4**	**1.5**	**2.7**
MERCURY	0.0007	0.0014	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U
NICKEL	0.1	0.2	0.01 U	0.013	0.01 U	0.01 U	0.01 U
POTASSIUM	--	--	5.6	5.4	2.4	2.1	2.0 U
SELENIUM	0.01	0.02	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
SILVER	0.05	0.1	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SODIUM	20	--	**70**	**59**	**71**	**66**	**41**
THALLIUM	0.0005	0.0005	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
VANADIUM	--	--	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
ZINC	2	5	0.02 U	0.10	0.02 U	0.02 U	0.02 U
Conventional Chemistry (mg/L)							
TOTAL DISSOLVED SOLIDS	--	--	550	450	440	590	420
TOTAL SUSPENDED SOLIDS	--	--	100	45	16	22	22

Notes:
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* The NYSDEC Class GA GW Standard and Effluent Limitation for PCBs is 0.09 ug/L.

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