Payson Long
New York State Department of Environmental Conservation (NYSDEC)
Division of Environmental Remediation
Bureau of Program Management
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Subject:
December 2017 Monthly Report
Fort Edward Landfill
NYSDEC Site No. 558001
Contract No. D007618-39

Date:
February 27, 2018

Contact:
Andy Vitolins

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518.250.7300

Email:
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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 December 2017 reporting period.

Leachate Collection and Treatment System Operation and Maintenance

The leachate treatment system shut down on six occasions in December 2017 due to Clarifier Catch Tank high alarms reported by the program logic controller (PLC). The alarms were caused because the PLC was improperly interpreting the level in the Clarifier Catch Tank, resulting in multiple high tank alarms activated by the high-level float switch. The issue was ultimately resolved by resetting the PLC.

A total of 756,889 gallons of leachate were collected and treated through the system during December 2017. The corresponding average leachate recovery rate for the month was approximately 15.5 gallons per minute (gpm).

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

- Precision Industrial Maintenance (PIM) performed pipe inspection and jetting of the southern leachate collection line on December 11 and 12, 2017. PIM also attempted to remove iron sludge from leachate collection well EW-4. However, the increased flow into the well after jetting the collection piping hindered removal of sludge from the well. Water

removed during the attempt to clean EW-4 was discharge to the Cell 1 drying bed on December 11, 2017. Due to a snow storm on December 12, 2017, the vacuum truck could not access the Cell 1 drying bed. Therefore, the water removed from EW-4 on December 12, 2017 was discharged into one of the treatment building floor sumps and was processed through the treatment plant.

- The pump in leachate collection well EW-4 was cleaned and replaced due to declining flow rates from iron fouling. However, due to the increased flow following jetting of the collection piping, the replacement pump was still not capable of maintaining the proper operating level in EW-4. On December 19, 2017, Arcadis installed a supplemental pump in EW-4 to assess the pumping rate required to maintain the proper level in the collection well. Based on the assessment, Arcadis recommends installing a pump capable of 40 gpm. However, due to the electrical load requirements for a larger pump and motor, the electrical service to the control panel will also have to be upgraded. Arcadis prepared a scope of work and solicited quotes from licensed electrical contractors to upgrade the electric service to the control panel. Arcadis will present the recommended upgrades and cost during the monthly conference call.
- Iron and solids sludge processing was performed throughout the month. In total, six 55-gallon drums of sludge were generated during December 2017.

System Sampling

The monthly samples were collected on December 19, 2017 from the following treatment system locations:

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

No samples were collected from extraction wells EW-1, EW-2, EW-3 or leachate collection well EW-4. Samples from these locations are collected on a quarterly basis and will be sampled again in the first quarter of 2018.

The monthly 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 and Clarifier Catch Tank samples at concentrations that exceeded the corresponding NYSDEC Class GA Standards. The treatment system

Influent and Clarifier Catch Tank samples contained vinyl chloride at 5.1 micrograms per liter (µg/L) and 4.6 µg/L, respectively. As shown in Table 1, the Clarifier Catch sample also contained cis-1,2-dichloroethene (cDCE) at a concentration of 7.2 µg/L. Table 1 shows that VOCs were detected in the Cell 3 Bypass sample, Cell 2 Effluent sample, and the Effluent sample from the Polishing Pond, but did not exceed the corresponding NYSDEC Class GA Standards.

PCBs

PCB Aroclor 1016 was detected in the Influent, Clarifier Catch Tank, and Cell 3 bypass samples at concentrations greater than the respective NYSDEC GA Standards. PCBs were not detected in the Cell 2 Effluent or Polishing Pond Effluent samples during the December 2017 sampling event (Table 1).

Metals

Iron and manganese were detected at one or more of the treatment system samples at concentrations greater than the corresponding NYSDEC Standards of 0.3 milligrams per liter (mg/L) and 0.6 mg/L, respectively. Iron concentration ranged from a maximum 19 mg/L (Influent) to 1.1 mg/L (Polishing Pond Effluent). This corresponds to a 94 percent reduction in iron through the treatment system. Manganese concentrations ranged from a maximum of 1.5 mg/L (Influent) to 0.66 mg/L (Polishing Pond Effluent).

TDS and TSS

The concentrations of TDS and TSS continue to fluctuate between sampling events. During the December sampling event, TDS concentrations ranged between 410 mg/L and 490 mg/L; TSS concentrations ranged from non-detect and 39 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 non-detect (ND) to 120 mg/L, respectively.

Next Reporting Period Planned Activities

The following activities are anticipated for January 2018:

- Continuation of iron and solids treatment and processing;
- Transportation and off-site disposal of sludge drums

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

Sincerely,

Arcadis CE, Inc.

Andy Vitolins, P.G.
Associate Vice President

Copies:
Jeremy Wyckoff, Arcadis
File

Enclosures:
Table 1 - December Treatment System Analytical Data

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

ARCADIS Design & Consultancy for natural and built assets

Chemical Name	NYSDEC Class GA GW Standard	NYSDEC Class GA GW Effluent Limitation	INFLUENT 12/19/2017	CLARIFIER CATCH 12/19/2017	CELL 3 12/19/2017	CELL 2 12/19/2017	EFFLUENT 12/19/2017
Volatile Organic Compounds (ug/L)							
ACETONE	50	50	50 U	50 U	50 U	50 U	50 U
BENZENE	1	1	0.48 J	0.39 J	1.0 U	1.0 U	1.0 U
BROMOCHLOROMETHANE	5	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
BROMODICHLOROMETHANE	50	50	0.5 U	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	20 U	20 U	20 U	20 U	20 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	0.55 J	0.48 J	1.0 U	1.0 U	1.0 U
CHLORODIBROMOMETHANE	50	--	0.5 U	0.5 U	0.5 U	0.5 U	0.5 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	1.0 U	1.0 U	1.0 U
1,3-DICHLOROBENZENE	3	3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-DICHLOROBENZENE	3	3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 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	3.7	**7.2**	3.4	1.2	0.76 J
TRANS-1,2-DICHLOROETHYLENE	5	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 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	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-HEXANONE	50	50	10 U	10 U	10 U	10 U	10 U
ISOPROPYLBENZENE (CUMENE)	5	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 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	1.0 U	1.0 U	1.0 U	1.0 U	1.0 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	1.0 U	0.22 J	1.0 U	1.0 U	1.0 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	**5.1**	**4.6**	0.45 J	2.0 U	2.0 U
M,P-XYLENES	5	5	2.0 U	0.26 J	2.0 U	2.0 U	2.0 U
O-XYLENE (1,2-DIMETHYLBENZENE)	5	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 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.
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.
ug/L - micrograms per liter
mg/L - milligrams per liter

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

ARCADIS Design & Consultancy for natural and built assets

Chemical Name	NYSDEC Class GA GW Standard	NYSDEC Class GA GW Effluent Limitation	INFLUENT 12/19/2017	CLARIFIER CATCH 12/19/2017	CELL 3 12/19/2017	CELL 2 12/19/2017	EFFLUENT 12/19/2017
Polychlorinated Biphenyls (ug/L)							
PCB-1016 (AROCLOR 1016)	*	*	**2.9**	**2.8**	**0.51**	0.19 U	0.19 U
PCB-1221 (AROCLOR 1221)	*	*	0.77 U	0.77 U	0.77 U	0.19 U	0.19 U
PCB-1232 (AROCLOR 1232)	*	*	0.77 U	0.77 U	0.77 U	0.19 U	0.19 U
PCB-1242 (AROCLOR 1242)	*	*	0.77 U	0.77 U	0.77 U	0.19 U	0.19 U
PCB-1248 (AROCLOR 1248)	*	*	0.77 U	0.77 U	0.77 U	0.19 U	0.19 U
PCB-1254 (AROCLOR 1254)	*	*	0.77 U	0.77 U	0.77 U	0.19 U	0.19 U
PCB-1260 (AROCLOR 1260)	*	*	0.77 U	0.77 U	0.77 U	0.19 U	0.19 U
PCB-1262 (AROCLOR 1262)	*	*	0.77 U	0.77 U	0.77 U	0.19 U	0.19 U
PCB-1268 (AROCLOR 1268)	*	*	0.77 U	0.77 U	0.77 U	0.19 U	0.19 U
Metals (mg/L)							
ALUMINUM	--	2	0.05 U	0.45	0.05 U	0.05 U	0.05 U
ANTIMONY	0.003	0.006	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
ARSENIC	0.025	0.05	0.0023	0.002 U	0.002 U	0.0027	0.002 U
BARIUM	1	2	0.052	0.05 U	0.05 U	0.052	0.05 U
BERYLLIUM	0.003	0.003	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
CADMIUM	0.005	0.01	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U
CALCIUM	--	--	0.15	82	92	99	98
CHROMIUM, TOTAL	0.05	0.1	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
COBALT	--	--	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
COPPER	0.2	1	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
IRON	0.3	0.6	**19**	**10**	0.096	**4.6**	**1.1**
LEAD	0.025	0.05	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
MAGNESIUM	35	35	20	19	20	20	23
MANGANESE	0.3	0.6	**1.5**	**1.4**	**0.4**	**0.66**	**0.48**
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	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
POTASSIUM	--	--	2.9	3.0	4.1	2.7	4.3
SELENIUM	0.01	0.02	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
SILVER	0.05	0.1	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U
SODIUM	20	--	**41**	**47**	**46**	**55**	**54**
THALLIUM	0.0005	0.0005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
VANADIUM	--	--	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
ZINC	2	5	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Conventional Chemistry (mg/L)							
TOTAL DISSOLVED SOLIDS	--	--	440	410	420	490	480
TOTAL SUSPENDED SOLIDS	--	--	16	14	2.0 U	39	2.0 U

Notes:
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Constitutents detected above the NYSDEC Class GA GW Effluent Limitation are highlighted in yellow.
* The NYSDEC Class GA GW Standard and Effluent Limitation for PCBs is 0.09 ug/L.
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