LIESCH
HYDROGEOLOGISTS ■ ENGINEERS ■ ENVIRONMENTAL SCIENTISTS

July 16, 2009

Mr. Hank Kuehling
WDNR
3911 Fish Hatchery Road
Fitchburg, WI 53711

RE: **Annual Operation and Maintenance Report (July 2008 – June 2009)**
Refuse Hideaway Landfill, Town of Middleton, Dane County, Wisconsin
BRRTS #02-13-000849

Dear Mr. Kuehling:

The purpose of this letter report is to summarize operation and maintenance (O&M) activities performed by Liesch Environmental Services, Inc. (Liesch) at the Refuse Hideaway Landfill (RHL) from July 2008 through June 2009. As monthly O&M reports were previously submitted, this Annual Report provides ranges for operating parameters and highlights changing trends or operating conditions.

SUMMARY

Highlights of O&M activities completed by Liesch during the 2008 – 2009 O&M year included:

- The Blower/Flare System ran approximately 70.4% of the operating year.
- The Leachate Collection System ran for approximately 98.8% of the operating year.

BACKGROUND

Liesch began routine monitoring of RHL systems on July 1, 2003. Prior to Liesch, SCS Field Services and Environmental Sampling Corporation monitored the landfill from July 1, 1997.

LFG Recovery System

The LFG Recovery System at RHL became operational in 1991. The LFG Recovery System consists of:

- Blower/Flare Station
- Collection System
- Monitoring Locations

The Blower/Flare Station includes one centrifugal LFG blower, an enclosed flare, a candlestick flare (previously used as a backup combustion unit but now out of service), and associated controls and appurtenances. The Collection System consists of 13 extractions wells, four drip legs, and associated gas and pneumatic header piping. The Monitoring Locations include 11 wells located throughout the site and ambient air monitoring within nearby Speedway buildings. Proper operation of the Collection System is verified through testing of the extraction wells. LFG withdrawal rates at individual well are adjusted based on test results. Testing for subsurface gas migration is done at the monitoring locations. Operation of the Blower/Flare Station provides vacuum necessary to withdraw the gas from the landfill, which helps control surface emissions and subsurface migration. Odors and emissions are controlled by combustion of the gas at the flare.

Leachate Collection System

The current leachate collection system was installed in 1996 and is comprised of pneumatic pumps installed in nine of the existing LFG extraction wells (eight wells until GW-10 was added in 2006). A compressor located at the Blower/Flare Station supplies compressed air for the pneumatic pumps. The collected leachate is stored onsite in a 25,000-gallon underground storage tank. Leachate is removed from the tank by a subcontractor and transported to the Madison Metropolitan Sewerage District (MMSD) for treatment and ultimate discharge.

TESTING EQUIPMENT

A Landfill Monitoring Systems (LMS) Multi-gas analyzer Model LMS 40 is utilized at the site to measure methane, carbon dioxide, and oxygen as percent by volume.

Pressure testing is measured in inches of water using Dwyer magnehelic gauges. LFG flow and temperature are measured with an Extech Model 407123 Hot Wire Thermo-Anemometer. Combustion temperatures were obtained from flare control panel instrumentation.

Leachate level was measured in one of two ways:

- For the gas extraction wells that have a leachate extraction pump, leachate levels were obtained indirectly using a bubbler tube.
- For the gas extractions wells that do not contain a leachate extraction pump, leachate levels were measured using an electric water level meter.

ON-SITE ACTIVITIES

Site/system activities generally consisted of inspecting, monitoring, maintaining, and/or recording data at or from various valves, meters, or sampling ports.

Weekly activities were performed at the following locations:

- Blower/Flare Control Panel
- Blower/Flare Station
- Leachate Tank
- Branch Monitoring Stations
- Flare Inlet Pipe
- Blower Inlet Pipe

Monthly activities were performed at the following locations:

- Extraction Wells
- Gas Probes
- Well Pumps/Controls
- Branch Monitoring Stations
- Flare Inlet Pipe
- Buried Control Valves
- Compressor (oil change)
- Pneumatic System (check for leaks)
- Blower Drive Belts (inspect/tighten)
- Landfill Surface (inspect)
- Monthly Report (including summary tables of system operation)

Quarterly activities were performed at the following locations:

- CV1, CV2, Branch Valves
- Well Valves, Compressor Valves
- Manual Valve (ground flare)
- Compressed Air Filter (inspect)
- Air Dryer Desiccant (inspect)
- Blower

Annual activities were performed at the following locations:

- Well pumps
- Leachate Lines, Driplegs
- Cleanouts
- Tank Loadout Station
- Padlocks

System statistics for the operating year are summarized in **Table 1** and further detailed in **Table 2** through **Table 5**:

- The average methane level at the blower was 37.6%.
- The average oxygen level at the blower was 3.0%.
- 214,360 gallons of leachate were removed from the landfill using the Leachate Collection System.
    - Laboratory analysis of leachate samples indicated that all analyzed metal compounds were below permitted discharge levels (see **Table 6**).
    - Laboratory reports were submitted to Madison Metropolitan Sewerage District per permit requirements.

With respect to scheduled repairs and improvements, implementation of recommendations were made and completed during this O&M contract. Included in this scope was the following:

1) Gas wells GW1-GW5, GW10, GW11, and GW12 were closed because they draw mostly oxygen and very little methane. Gas well GW7 was reduced to only allow 50% of gas to the flare and GW8 was reduced to 25%. Gas well GW13 was opened to 100% to allow for as much of the methane it is drawing to reach the flare. The gas extraction valves were adjusted to achieve an optimal mix of 50% methane and 50% carbon dioxide. After adjusting the gas wells, the flame burned visibly higher in the flare indicating a stronger gas concentration.

2) The leachate lines were jetted and cleaned out on May 11, 2009 and there were no issues. In addition, the south branch was jetted at GW-5 to attempt to restore some flow through the south branch. The 3"x6" reducer between the above-grade piping (3") and the header piping (6") was used as a cleanout to allow normal line jetting equipment to be used.

3) John Gwinn from Vulcan Flare was onsite September 22, 2008 through September 25, 2008 to examine and perform repairs on the flare system. During the investigation, it was noted that the pressure at the flare entrance was -0.05 in. w.c.; this pressure is much lower than what it should be. The low pressure results in very low flow entering the flare which means low methane content which means the flare will burn at a much lower temperature than designed. Upon entering the flare and investigating the inside, John Gwinn found a hole in the burner manifold due to some sort of mini explosion inside the flare. It appeared some type of fuel had made its way into the flare near the burner causing excessive heat at the burner which caused the metal of the burner to melt and separate. John Gwinn felt this hole could be causing the low pressure at the flare entrance. John Gwinn repaired the hole in the burner by removing the distorted metal and placing a patch on the burner. As a result of this a few of

the nozzles in the burner were lost. After the burner hole was repaired, the pressure measured at the flare was 0.5 in. w.c. This pressure is still much lower than what the system was originally designed for. In addition a pressure relief valve in the flare gas supply line was capped using a blind flange. The valve was capped because the seal on the relief seat was cracked and not sealing properly. As the system currently operates the pressure relief valve is not necessary. After repairing the burner hole, John Gwinn investigated the remaining portions of the flare system. The flare system as a whole operates properly and functions as designed. Because of the low temperatures in the flare the low temperature alarm is shutdown.

4) On May 5, 20, and 27, Liesch cleaned leachate pumps in wells GW4, 5, 7, 8, 9, 10, and 11. Cleaning the pumps consisted of removing the pump casing and scrubbing the inside of the pump and casing with Simple Green cleaning solution. The inside of the pumps had leachate coating the float and casing along with sediment stuck to the inside of the casing and to the pump floats. In addition, the compressor air inlet and exhaust ports were clogged with sediment and debris. The exhaust line for well GW4 was clogged several feet from the pump and that line had to be replaced. The leachate pumps in GW12 and GW13 were not cleaned because the pumps were unable to be removed as a result of collapsing of their well casings.

The following non-scheduled repairs were made during the O&M year:

1) On June 21, 2009, Braun Corporation performed a service call to replace the solenoid valve at the flare that allows the propane gas to enter the pilot in order to light the pilot.

2) A broken air line for GW13 was patched.

The following items were also noted throughout the operating year:

1) Inconsistent flows and/or gas concentrations can fool the flame signal eye resulting in false flame failure alarms. With low gas concentrations (especially those below 20%), the auto-dialer alarm is activated up to four times a day even though the flare typically does not go out.

2) The flare re-start sequence is complicated by a continuously alarming high pilot gas pressure transducer. To restart the flare system, the transducer has to be jumped/bypassed to allow the start-up sequence to proceed.

3) The methane levels within the landfill have been steadily declining. We believe this is because of the age of the landfill and the methane production is slowing down as a result of natural processes. The declining methane levels have caused problems with the flare and its ability to consistently burn.

4) Visual inspections of the landfill surface did not reveal significant erosion concerns or stressed vegetation, other than the persistent low growth zone along the ridge in the southern portion of the landfill in the vicinity of GW-1, GW-2, and GW-3.

5) Methane detected in the G-1, G-2, and G-11 well nests depended heavily on the time of year. The highest readings were during the summer months with little to no methane detected during the winter months.

6) The leachate pump cycles experienced low numbers during 2008 and 2009. Liesch personnel pulled and cleaned the pumps inside and out and the discharge, vent lines, and air inlet lines, and found sediment was blocking the pumping lines. Liesch personnel removed the blockage and then the pumps operated properly. However on subsequent visits not all the pumps were operating. Liesch feels the characteristics of leachate are interfering with the operation of the pumps by causing the pumps to malfunction and not operate as they are designed.

CONCLUSIONS / RECOMMENDATIONS

An evaluation of repairs and improvements needed for effectively operating the Blower/Flare System and Leachate Collection System was completed during 2008 as problems would arise and was successfully implemented during the past operating year. In addition, non-scheduled repairs were made in order to maintain the remedial systems at the landfill. After addressing two remaining issues, the remedial systems should be poised for many additional years of useful life.

First, the leachate pumps are not operating as designed and not adequately pumping leachate from the landfill. During the cleaning it was noted the leachate contained sediment and appeared to prevent the pump from operating as it was designed. Based upon our observations of the leachate and the pumps, Liesch feels the leachate pumps should be removed and cleaned on a semi-annual basis in order to keep the pumps operating to their full capacity.

Second, the methane levels within the landfill been steadily declining, especially during the winter months. During the winter months, Liesch recommends operating the flare on a non 24-hour basis.

This could be done by shutting down the blower system and allowing the methane concentrations to increase and then starting the blower system and burning off the methane. Once the methane has been exhausted the blower system would be shut down. This process could be done twice a week or as necessary.

Feel free to call me at (608) 295-6230 if you have any questions.

Sincerely,

LIESCH ENVIRONMENTAL SERVICES, INC.

Joshua D. Davenport, P.E.
Environmental Engineer

Attachments: Table 1 (System Summary)
Table 2 (Methane at Wells)
Table 3 (Velocity at Wells)
Table 4 (System Hours)
Table 5 (Problematic System Components)
Table 6 (Leachate Tank Laboratory Analytical Results)

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TABLE 1
REFUSE HIDEAWAY LANDFILL

OPERATING PARAMETERS SUMMARY
July 2008 - June 2009
System Summary

	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Average	Min.	Max.
% Methane at Blower (average during month)	40.2	39.1	39.9	38.5	34.1	34.6	26.5	37.0	38.5	37.0	41.0	45.1	37.6	26.5	45.1
% Oxygen at Blower (average during month)	2.8	2.4	2.4	2.1	2.8	2.6	2.7	3.3	4.7	4.2	3.2	3.0	3.0	2.1	4.7
Leachate Collected (gallons)	29,407	29,274	14,744	14,885	9,849	9,871	5,214	9,689	14,311	9,781	43,865	23,470	17,863	5,214	43,865
											TOTAL Leachate		214,360		

		Average	Min.	Max.
% Methane at Extraction Wells	GW1	44.0	1.6	56.0
	GW2	10.8	0.0	39.5
	GW3	32.3	0.0	64.3
	GW4(1)	37.8	13.0	69.0
	GW5(1)	26.6	8.0	65.0
	GW6	50.2	39.5	60.0
	GW7(1)	34.0	3.2	69.0
	GW8(1)	48.3	9.1	67.0
	GW9(1)	36.4	14.5	52.0
	GW10(1)	32.2	4.0	66.0
	GW11(1)	43.1	0.0	78.0
	GW12(1)	24.2	0.2	52.0
	GW13(1)	52.8	48.5	58.0

		Average	Min.	Max.		Average	Min.	Max.
Velocity (fpm) at Extraction Wells	GW1	135	66	339	**Flow (cfm)**	4.6	2.2	11.6
	GW2	303	54	1598		10.7	1.8	58.2
	GW3	207	64	460		7.1	2.1	16.1
	GW4(1)	260	66	870		9.0	2.2	31.3
	GW5(1)	609	86	1412		21.6	2.9	50.8
	GW6	2100	1221	4000		76.7	44.0	149.4
	GW7(1)	699	330	1415		24.8	11.3	50.9
	GW8(1)	922	148	4000		33.4	5.0	149.4
	GW9(1)	743	279	1950		26.5	9.5	71.1
	GW10(1)	602	110	2160		21.4	3.7	78.7
	GW11(1)	884	130	3180		31.8	4.3	117.3
	GW12(1)	1045	64	3819		37.8	2.1	140.9
	GW13(1)	610	275	1512		21.6	9.4	55.1
	TOTAL	9118			TOTAL	326.9		

	Average	Min.	Max.
LFG Blower (%)	70	0	100
LFG Hours per month	510.1	0.0	791.8
Leachate Compressor (%)	98.8	90	100

* 4 wells with operational pumps now (previous months only 2 wells)

(1) wells with pneumatic leachate pumps installed.

TABLE 2
REFUSE HIDEAWAY LANDFILL

OPERATING PARAMETERS SUMMARY
July 2008 - June 2009
Methane (%) at Wells

	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Average	Min	Max
GW1	54.2	50.0	52.0	54.0	54.0	52.0	52.0	44.0	56.0	1.6	15.0	43.0	44.0	1.6	56.0
GW2	1.5	3.0	13.5	2.2	9.5	39.0	39.5	19.0	0.2	0.0	0.0	2.6	10.8	0.0	39.5
GW3	64.3	37.0	53.0	30.0	0.0	57.0	60.0	61.0	1.4	0.0	22.0	2.4	32.3	0.0	64.3
GW4 (1)	42.5	33.0	35.5	23.5	13.0	25.0	25.0	20.0	61.0	42.0	64.0	69.0	37.8	13.0	69.0
GW5 (1)	20.8	10.0	24.0	13.5	15.0	46.5	13.0	22.0	16.0	8.0	65.0	65.0	26.6	8.0	65.0
GW6	56.4	53.0	55.0	49.5	47.0	44.0	39.5	54.0	60.0	46.0	46.0	52.0	50.2	39.5	60.0
GW7 (1)	29.4	26.0	33.5	3.2	31.0	34.0	31.0	^	65.0	28.0	24.0	69.0	34.0	3.2	69.0
GW8 (1)	67.0	65.0	66.0	65.0	58.0	62.0	50.0	9.1	48.0	22.0	27.0	40.5	48.3	9.1	67.0
GW9 (1)	35.5	41.5	23.0	29.0	31.0	52.0	14.5	26.0	50.0	33.0	52.0	49.5	36.4	14.5	52.0
GW10 (1)	33.6	35.0	45.0	33.5	27.0	15.0	31.5	25.5	61.0	9.3	4.0	66.0	32.2	4.0	66.0
GW11 (1)	23.6	60.0	37.0	56.0	40.0	46.0	11.0	^	45.0	0.0	78.0	78.0	43.1	0.0	78.0
GW12 (1)	28.9	26.0	33.5	26.0	23.0	25.0	16.0	21.5	52.0	18.0	20.0	0.2	24.2	0.2	52.0
GW13 (1)	52.5	50.0	49.5	56.0	53.0	56.0	48.5	54.0	58.0	51.0	52.0	53.0	52.8	48.5	58.0

(1) wells with pneumatic leachate pumps installed.

TABLE 3
REFUSE HIDEAWAY LANDFILL

OPERATING PARAMETERS SUMMARY
July 2008 - June 2009
Velocity (fpm) and Flow (cfm) at Wells

VELOCITY	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Average	Min	Max
	**	**	**	**	**	**	**	**	**	**	**	**			
GW1	76	90	70	162	72	76	339	120	211	76	66	266	135	66	339
GW2	54	86	97	1598	63	115	186	96	116	711	108	403	303	54	1598
GW3	105	80	72	153	64	415	208	213	193	414	101	460	207	64	460
GW4 (1)	66	376	166	103	200	870	262	180	169	172	130	427	260	66	870
GW5 (1)	321	497	200	678	389	1140	500	550	627	908	86	1412	609	86	1412
GW6	1672	1700	1882	1221	1450	2264	2415	1264	2420	2071	2846	4000	2100	1221	4000
GW7 (1)	450	346	650	521	445	1415	763	330	1390	503	1200	380	699	330	1415
GW8 (1)	470	233	325	350	880	4000	417	148	1400	638	400	1800	922	148	4000
GW9 (1)	479	475	279	536	520	1950	300	509	550	1150	720	1450	743	279	1950
GW10 (1)	250	226	183	406	288	1995	267	255	2160	702	110	379	602	110	2160
GW11 (1)	495	750	641	534	1440	3180	720	1370	680	538	130	130	884	130	3180
GW12 (1)	1293	511	650	930	1114	3819	1115	940	1550	426	122	64	1045	64	3819
GW13 (1)	366	350	275	302	704	467	322	277	1180	460	1100	1512	610	275	1512
TOTAL	**6,097**	**5,720**	**5,490**	**7,494**	**7,629**	**21,706**	**7,814**	**6,252**	**12,646**	**8,769**	**7,119**	**12,683**			
FLOW	(Calculated)														
GW1	2.5	3.0	2.3	5.5	2.4	2.5	11.6	4.0	7.1	2.5	2.2	9.1	4.6	2.2	11.6
GW2	1.8	2.9	3.2	58.2	2.1	3.8	6.3	3.2	3.9	25.3	3.6	14.0	10.7	1.8	58.2
GW3	3.5	2.7	2.4	5.1	2.1	14.4	7.0	7.2	6.5	14.3	3.4	16.1	7.1	2.1	16.1
GW4 (1)	2.2	13.0	5.6	3.4	6.8	31.3	8.9	6.1	5.6	5.8	4.3	14.8	9.0	2.2	31.3
GW5 (1)	11.0	17.4	6.8	24.1	13.5	41.0	17.6	19.3	22.0	32.7	2.9	50.8	21.6	2.9	50.8
GW6	60.9	62.0	68.6	44.0	52.5	82.5	88.0	45.5	88.2	75.5	103.7	149.4	76.7	44.0	149.4
GW7 (1)	15.7	11.8	23.0	18.3	15.4	50.9	27.3	11.3	50.0	17.7	43.2	13.2	24.8	11.3	50.9
GW8 (1)	16.5	7.9	11.1	12.0	31.7	149.4	14.4	5.0	50.4	22.4	13.9	65.6	33.4	5.0	149.4
GW9 (1)	16.8	16.7	9.5	18.8	18.3	71.1	10.3	17.9	19.3	41.4	25.6	52.5	26.5	9.5	71.1
GW10 (1)	8.5	7.6	6.2	14.1	9.8	72.7	9.1	8.7	78.7	25.0	3.7	13.1	21.4	3.7	78.7
GW11 (1)	17.4	26.8	22.4	18.7	51.8	117.3	25.6	49.3	24.2	18.9	4.3	4.3	31.8	4.3	117.3
GW12 (1)	46.5	17.9	22.7	33.5	40.1	140.9	40.1	33.8	56.5	14.8	4.1	2.1	37.8	2.1	140.9
GW13 (1)	12.7	12.0	9.4	10.3	25.0	16.3	11.0	9.5	42.5	16.1	39.6	55.1	21.6	9.4	55.1
TOTAL	**216**	**202**	**193**	**266**	**272**	**794**	**277**	**221**	**455**	**312**	**254**	**460**	**327**		

(1) wells with pneumatic leachate pumps installed
*Average velocity (manually with meter)
**Centerpoint velocity
Boxed value indicates minimum (capacity of meter)

J:\5905600\Tables\System Averages 2008-2009.xls [Velocity (fpm) and Flow (cfm)]

TABLE 4
REFUSE HIDEAWAY LANDFILL

OPERATING PARAMETERS SUMMARY
July 2008 - June 2009
System Hours

	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Average	Min	Max
LFG Blower (%)	100	100	75	100	90	75	5	0	50	50	100	100	70.4	0	100
Blower Counter end	27763	28512.3	29145.4	29912.0	30583.4	31282.2	31449.6	31449.6	31665.3	31906.9	32574.9	33092.4			
Blower Hours	791.8	749.3	633.1	766.6	671.4	698.8	167.4	0.0	215.7	241.6	668.0	517.5	510.1	0.0	791.8
Leachate Compressor (%)	95	100	100	90	100	100	100	100	100	100	100	100	98.8	90	100
Compressor Counter end	1338.0	1508.2	1651.0	1770.7	1888.0	2011.3	2035.1	2035.1	2267.4	2351.4	2457.8	2589.2			
Compressor Hours	129.8	170.2	142.8	119.7	117.3	123.3	23.8	0.0	232.3	84.0	106.4	131.4	115.1	0.0	232.3

TABLE 5
REFUSE HIDEAWAY LANDFILL

OPERATING PARAMETERS SUMMARY
July 2008 - June 2009
Problematic System Components

	Problematic air flow control valve	Problematic counter
GW1		
GW2		
GW3		
GW4 (1)		
GW5 (1)		
GW6		
GW7 (1)		
GW8 (1)		
GW9 (1)		
GW10 (1)		
GW11 (1)		
GW12 (1)		
GW13 (1)		
South Branch		
Central Branch		
North Branch		
Compressor Meter		
CV1 and CV2		

(1) wells with pneumatic leachate pumps installed. J:\5905600\Tables\System Averages 2008-2009.xls [Problematic System Components]

Table 6
Leachate Tank Laboratory Analytical Results
Refuse Hideaway Landfill
Town of Middleton, Wisconsin

	PARAMETER										
DATE	Cadmium (ug/L)	Total Chromium (ug/L)	Hexavalent Chromium (ug/L)	Copper (ug/L)	Lead (ug/L)	Mercury (ug/L)	Nickel (ug/L)	Selenium (ug/L)	Silver (ug/L)	Zinc (ug/L)	Cyanide (ug/L)
Permitted Levels	**250**	**10000**	**500**	**1500**	**5000**	**20**	**2000**	**300**	**3000**	**8000**	**100**
9/30/2003	<0.88	54		8	<2.2	<0.030	150	<8.0	<1.8	54	
10/9/2003			<260,000								5.8
2/23/2004	<0.53	30	<270	24	<1.3	<0.030	93	<4.8	6.5	40	16
8/5/2004	<0.17	21	<27	4.1	1.9	<0.028	54	6.5	0.21	19	15
11/4/2004	<1.7	33	<2.7		2.8	<0.30		13	<0.49		5.4
12/21/2004	<1.7	52	<2.7	8.6	5.4	<0.028	180	21	<0.49	36	9.1
3/31/2005	0.68	15	<2.7	6.9*	12	<0.028					5.5*
6/30/2005	<1.00	12.8	<40	6.20	1.70	<0.07	40.5	16.7	<1.00	458	7
9/21/2005	<1.00	17.8	<40	13.5	8.30	<0.07	46.5	20.1	4.20	95.1	<5
11/16/2005	<1.00	14.2	<40	3.04	<1.50	<0.07	44.6	31.6	5.20	<10.0	10*
2/9/2006	<1.00	16.3	<40	<3.00	<1.50	<0.07	59.3	28.8	<1.00	17.9	17
5/18/2006	<1.00	24.4*	<40	3.40*	<1.50	<0.07	38.3	21.1	1.32*	8.0*	9*
8/28/2006	<1.00	19.2*	<40	5.10*	2.96*	<0.07	32.7	28.0	<1.00	36.6	6*
11/8/2006	<1.00	11.6*	<20	<3.00	<1.50	<0.07	55.2	28.0	5.81*	10.9*	15*
2/21/2007	<1.00	19.1*	<40	20.8	1.59*	<0.07	50.4	51.8	6.30*	<10	12*
6/6/2007	<1.00	10.6*	<40	<3.00	2.92*	<0.07	41.3	10.2	6.77*	17.2*	7*

Table 6
Leachate Tank Laboratory Analytical Results
Refuse Hideaway Landfill
Town of Middleton, Wisconsin

	PARAMETER										
DATE	Cadmium (ug/L)	Total Chromium (ug/L)	Hexavalent Chromium (ug/L)	Copper (ug/L)	Lead (ug/L)	Mercury (ug/L)	Nickel (ug/L)	Selenium (ug/L)	Silver (ug/L)	Zinc (ug/L)	Cyanide (ug/L)
Permitted Levels	**250**	**10000**	**500**	**1500**	**5000**	**20**	**2000**	**300**	**3000**	**8000**	**100**
9/4/2007	<1.00	<8.00	<40	3.07*	2.53*	<0.07	49.9	4.96*	7.42*	19.3*	<5
1/16/2008	<1.00	17.7*	<40	8.80*	4.83*	<0.07	62.2	4.73*	7.30*	42.7	11*
3/31/2008	<1.00	13.4*	<40	<3.00	<1.50	<0.07	38.1	<3.00	<1.00	<10.0	6*
7/1/2008	<1.00	30.6	<40	<3.00	<1.50	<0.07	64.8	<3.00	1.13*	10.1*	19
9/17/2008	<1.00	30.7	<40	12.6	1.70*	<0.07	82.9	5.87*	1.54*	34.7	22
1/6/2009	<1.00	25.0*	<40	7.96*	<1.50	<0.07	70.6	<3.00	<1.00	59.1	10*
4/7/2009	<1.00	21.1*	<40	7.93*	<1.50	<0.07	56.6	<3.00	<1.00	17.4*	8*
6/30/2009	<1.00	23.5*	<40	<3.00	<1.50	<0.07	69.6	<3.00	<1.00	<10.0	14*

Notes

Results in **bold** indicate levels above permit limitations.
Blank cell indicates parameter not analyzed.
ug/l = micrograms per liter
* = Analyte detected between limit of detection and limit of quantitation.