



East Coast Environmental, P.A.

3815 Junction Boulevard Raleigh, NC 27603
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May 9, 2013

Ms. Jaclynne Drummond
Compliance Hydrogeologist
NC Department of Environment and Natural Resources Division of Waste
Management - Solid Waste Section 1646 Mail Service Center
Raleigh, North Carolina 27699-1646

RE: First Semi-annual Groundwater Monitoring Report of 2013 Lee County Landfill,
Permit No. 53-01
Lee County, North Carolina

Dear Ms. Drummond:

On behalf of Lee County, East Coast Environmental, P.A. (ECE) is submitting the enclosed *First Semiannual Groundwater Monitoring Report of 2013* in electronic format. This completes the first semiannual compliance monitoring event of 2013 for the closed Lee County Landfill, Permit No. 53-01, as required by the North Carolina Division of Waste Management, Solid Waste Section. Please contact me at (919) 772-0268 if you have any questions regarding this submittal.

Sincerely,

Thomas R. Will, North Carolina Licensed Geologist 1164
Project Manager
East Coast Environmental, P.A.

Enclosures

C: Joseph Cherry - Lee County, Solid Waste Superintendent

Notice: This form and any information attached to it are "Public Records" as defined in NC General Statute 132-1. As such, these documents are available for inspection and examination by any person upon request (NC General Statute 132-6).

- Instructions:**
- Prepare one form for each individually monitored unit.
 - Please type or print legibly.
 - Attach a notification table with values that attain or exceed NC 2L groundwater standards or NC 2B surface water standards. The notification must include a preliminary analysis of the cause and significance of each value. (e.g. naturally occurring, off-site source, pre-existing condition, etc.).
 - Attach a notification table of any groundwater or surface water values that equal or exceed the reporting limits.
 - Attach a notification table of any methane gas values that attain or exceed explosive gas levels. This includes any structures on or nearby the facility (NCAC 13B .1629 (4)(a)(i)).
 - Send the original signed and sealed form, any tables, and Electronic Data Deliverable to: Compliance Unit, NCDENR-DWM, Solid Waste Section, 1646 Mail Service Center, Raleigh, NC 27699-1646.

Solid Waste Monitoring Data Submittal Information
 Name of entity submitting data (laboratory, consultant, facility owner):

East Coast Environmental, P.A.

Contact for questions about data formatting. Include data preparer's name, telephone number and E-mail address:

Name: Thomas Will Phone: (919) 772-0268
 E-mail: ecoaste@bellsouth.net

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)
Lee County Landfill	330 Landfill Road	53-01	0.0500	April 17, 2013

Environmental Status: (Check all that apply)
 Initial/Background Monitoring Detection Monitoring Assessment Monitoring Corrective Action

Type of data submitted: (Check all that apply)
 Groundwater monitoring data from monitoring wells Methane gas monitoring data
 Groundwater monitoring data from private water supply wells Corrective action data (specify) _____
 Leachate monitoring data Other(specify) _____
 Surface water monitoring data

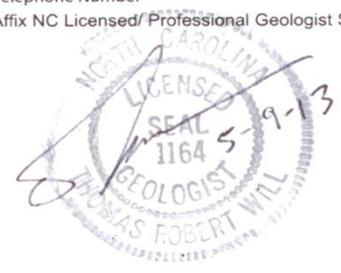
Notification attached?
 No. No groundwater or surface water standards were exceeded.
 Yes, a notification of values exceeding a groundwater or surface water standard is attached. It includes a list of groundwater and surface water monitoring points, dates, analytical values, NC 2L groundwater standard, NC 2B surface water standard or NC Solid Waste GWPS and preliminary analysis of the cause and significance of any concentration.
 Yes, a notification of values exceeding an explosive methane gas limit is attached. It includes the methane monitoring points, dates, sample values and explosive methane gas limits.

Certification
 To the best of my knowledge, the information reported and statements made on this data submittal and attachments are true and correct. Furthermore, I have attached complete notification of any sampling values meeting or exceeding groundwater standards or explosive gas levels, and a preliminary analysis of the cause and significance of concentrations exceeding groundwater standards. I am aware that there are significant penalties for making any false statement, representation, or certification including the possibility of a fine and imprisonment.

Thomas Will Project Manager (919) 772-0268
 Facility Representative Name (Print) Title (Area Code) Telephone Number
 Signature Date Affix NC Licensed/Professional Geologist Seal

3815 Junction Boulevard, Raleigh, NC 27603
 Facility Representative Address

NC PE Firm License Number (if applicable effective May 1, 2009)
 Revised 6/2009





East Coast Environmental, P.A.

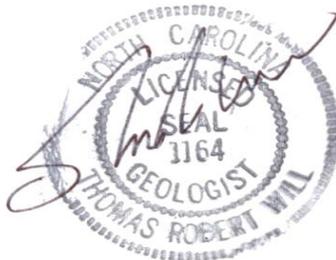
3815 Junction Boulevard Raleigh, NC 27603
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**FIRST SEMI-ANNUAL GROUNDWATER MONITORING
REPORT OF 2013**

**PREPARED FOR:
LEE COUNTY GENERAL SERVICES
805 S. FIFTH STREET SANFORD, NORTH CAROLINA 27330
LEE COUNTY LANDFILL PERMIT No. 53-01**

Prepared by:

East Coast Environmental, P.A.
3815 Junction Boulevard
Raleigh, North Carolina
(919) 772-0268



**First Semiannual Groundwater Monitoring Report of 2013
Lee County Landfill
Lee County, North Carolina**

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1.0 INTRODUCTION

1.1 Site Information

The Lee County Landfill is a closed, unlined municipal solid waste (MSW) and construction & demolition (C&D) landfill located on approximately 254.6 acres in Lee County, NC, approximately 6.5 miles south of Sanford. The six MSW and one C&D waste disposal areas comprise approximately 100.8 acres. The property boundary is indicated on an excerpt from the 7.5 minutes USGS topographic map for Muchison & Sanford, North Carolina (Figure 1). The MSW portion of the facility ceased accepting waste prior to October 9, 1993, and a letter of closure was issued on December 20, 1996. The C&D portion of the facility was issued a Permit to Operate on July 25, 1995 and ceased accepting waste June 30, 2008.

1.2 Site Geology and Hydrogeology

The Lee County Landfill is located near the edge of the Coastal Plain Physiographic Province. The facility is underlain by the Middendorf Formation consisting of sand, sandstone, and mudstone. The Middendorf Formation is underlain by metavolcanic rocks of the Eastern Slate Belt. The uppermost aquifer is unconfined. The groundwater level measurements taken in April 2013 were used to construct the potentiometric surface contours shown in Figure 2. Historical static water levels are provided in Table 1. Groundwater flow at the site is generally to the southeast.

1.3 Regulatory Status

The Lee County Landfill is currently monitoring groundwater in accordance with criteria set forth in Rule .0500 of the North Carolina Solid Waste Management Rules (NCSWMR) for MSW landfills closed prior to October 9, 1993 and C&D landfills closed prior to July 1, 2008.

2.0 FACILITY MONITORING PROGRAM

2.1 Groundwater Monitoring Program

The current groundwater compliance monitoring network includes 6 monitoring wells. In addition, there are 4 monitoring wells used only for water level measurements. These wells are summarized below, along with their current monitoring program status. The locations of the monitoring wells are shown on Figure 2.

Groundwater samples are collected semiannually in April and October. Samples are analyzed for RCRA metals and the NC Appendix I list of volatile organic constituents during the first and second semiannual events.

Monitoring Well	Classification	Monitoring Program	Total Depth From TOC (ft)
MW-4	Observation	Water Levels Only	10.45
MW-5	Compliance	Detection (.0500)	6.30
MW-6	Compliance	Detection (.0500)	9.55
MW-7	Observation	Water Levels Only	8.43
MW-9	Compliance	Detection (.0500)	8.28
MW-10	Compliance	Detection (.0500)	7.39
MW-11	Observation	Water Levels Only	9.95
MW-12	Compliance	Detection (.0500)	3.78
MW-13	Observation	Water Levels Only	7.69
MW-14	Compliance	Detection (.0500)	6.13

*TOC = Top of casing.

2.2 Surface Water Monitoring Program

Surface water at the Lee County Landfill is monitored semiannually in conjunction with the groundwater sampling events. Samples are collected from one surface water monitoring point (SW-2). Samples are not collected from SW-1. The location of the surface water monitoring point is shown on Figure 2.

Surface water samples will be collected and analyzed for RCRA metals and the NC Appendix I list of volatile organic constituents during both semiannual monitoring events. These surface water monitoring point are summarized below, along with their current monitoring program status.

Surface Point	Classification	Monitoring Program
SW-1	Not Monitored	Surface Water
SW-2	Compliance	Surface Water

3.0 FIELD WORK AND LABORATORY ANALYSIS

In order to detect potential releases of leachate and/or landfill gas migration in a timely manner, a visual inspection program has been implemented at the Lee County Landfill. This inspection program involves field personnel making the following observations:

- Observation of stress induced on the biological community (e.g., dead or dying vegetation),
- Indications of leachate impact (e.g., seeps, impacted surface water),
- Observations of erosion; and
- Negative changes around the waste facility.

On April 17, 2013 ECE personnel visited the facility to purge and sample the facility's monitoring wells MW-5, MW-6, MW-9, MW-10, MW-12, and MW-14. Prior to purging, the depth to static water level was measured for all monitoring wells with an electronic water level indicator, accurate to 0.01 foot. MW-4, MW-7, MW-11, and MW-13 were measured for static water levels only.

Monitoring wells were purged and sampled using disposable bailers. Measurements of temperature, pH, specific conductivity, and turbidity were recorded in the site specific log book prior to purging, after each purge volume, and during sampling. Prior to sampling, laboratory-supplied containers were prepared with the following information:

- Monitoring well number (completed by field personnel),
- Date and time of sample collection (completed by field personnel),
- Initials of sampling personnel (completed by field personnel),
- Project name and number (completed by the laboratory),
- Chemical preservative (completed by the laboratory); and
- Requested chemical analysis (completed by the laboratory).

Groundwater samples from each monitoring well were collected directly from the disposable bailers in the provided laboratory containers immediately after purging. Immediately after collection, the samples were placed in a laboratory provided cooler and chilled on ice.

Surface water samples are collected directly from stream flow, by lowering the prepared sample containers into the stream flow with the opening facing into the current flow. Care is taken not to overflow the sample containers (which could lead to preservative loss) and avoid sample induced turbidity. At the time of sampling, surface water is also measured for temperature, pH, specific conductivity, and turbidity. After sample collection, the samples are placed in a laboratory provided cooler and chilled on ice.

The April 2013 groundwater and surface water samples were submitted to Environmental Conservation Laboratories (ENCO) of Cary, North Carolina under chain-of-custody control for analysis. As presented earlier, the groundwater samples were analyzed for RCRA metals and the NC Appendix I list of volatile organic constituents. ECE requested a Level II data report for the final laboratory report. The samples were received by the laboratory on April 18, 2013 in good condition, properly preserved, and within analysis hold times.

In addition to samples collected for compliance monitoring at the Lee County Landfill, a Field Blank was collected by ECE personnel as part of the April 2013 sampling event. Also, a Trip Blank was prepared by the laboratory to accompany the volatile sampling containers during shipment to and from the laboratory. The April 2013 Field Blank was analyzed for RCRA metals and the NC Appendix I list of volatile organic constituents while the April 2013 Trip Blanks was analyzed for the NCSWMR Appendix I volatile organic constituent only.

4.0 DATA ANALYSIS AND COMPARISONS TO STANDARDS

Results from the April 2013 sampling event were received May 3, 2013 from ENCO and are attached. Analytical results from monitoring wells were compared directly to the NC 2L Groundwater Standards or Groundwater Protection Standards. Analytical results from the surface water monitoring point are also compared to the NC 2B Surface Water Standards. A summary of the April 2013 detected constituents can be found in Table 2.

5.0 CONCLUSIONS

Based on historical water quality data, constituents detected in groundwater and surface water samples collected during the April 2013 monitoring event are consistent with previous events. The Lee County Landfill will remain in Detection Monitoring and the next semiannual sampling event is scheduled for the October 2013.

6.0 REFERENCES

Brown, Philip M., Chief Geologist, 1985, *Geologic Map of North Carolina*, The North Carolina Geologic Survey, scale 1:500,000.

North Carolina Department of Environment and Natural Resources, 1990-2011, *Solid Waste Management Regulations*.

USEPA, 1986, *RCRA Ground Water Monitoring Technical Enforcement Guidance Document (TEGD)*.

USEPA, 1992, *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Addendum to Interim Final Guidance*, Chapter 2, July.

Second Semiannual Groundwater Monitoring Report of 2011. January 2012. Prepared by Joyce Engineering

Figures

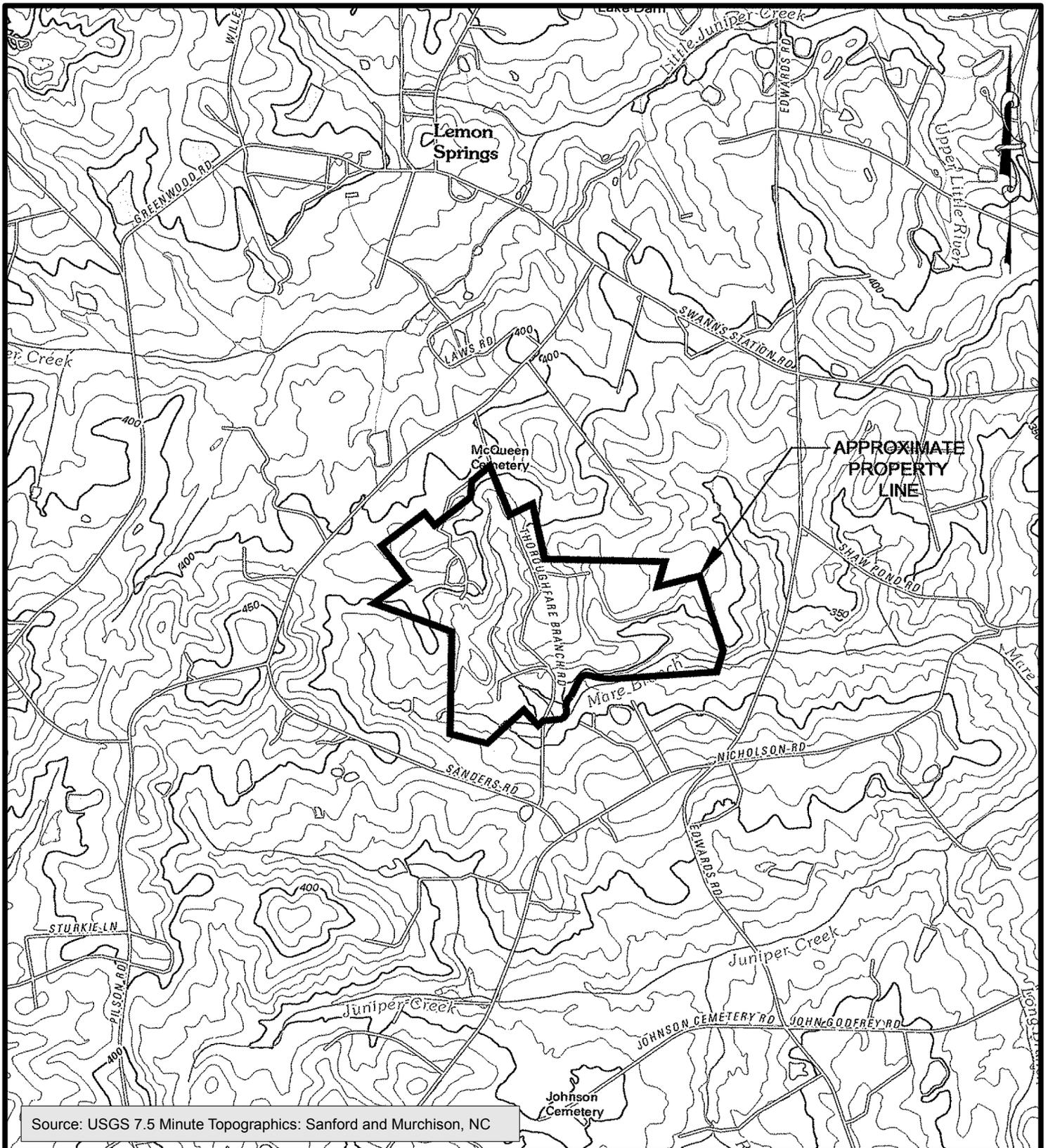


Figure 1
 Site Location Map
 Lee County Landfill
 331 Landfill Road
 Lee County, North Carolina



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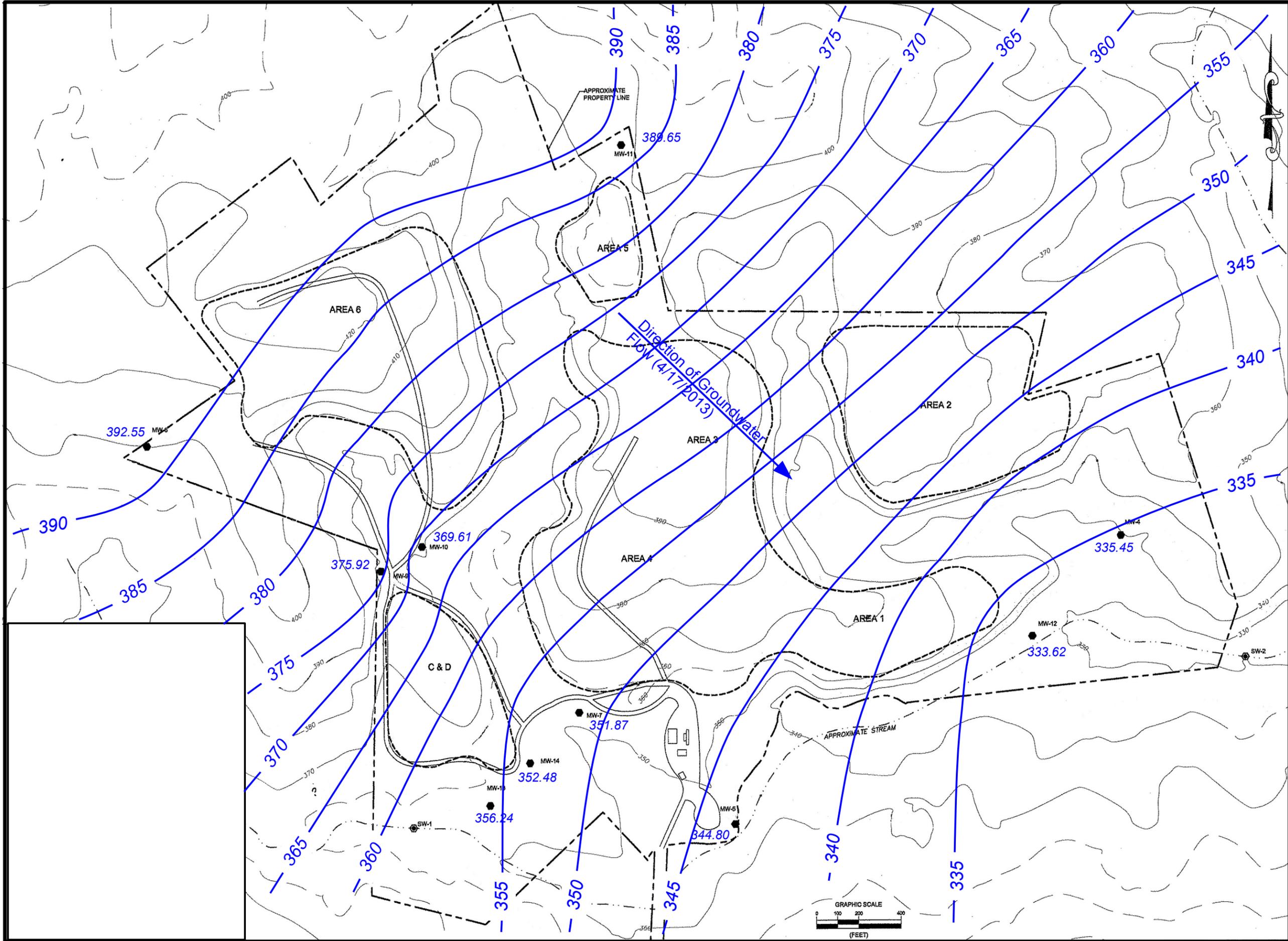
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Scale:
 1"=2000'

Prep. By:
 CKC

Rev. By:
 TRW

Date:
 11/12/2012



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Figure 2
 Groundwater Hydraulic Gradient Map - 4/17/2013
 Lee County Landfill
 Landfill Road
 Lee County, North Carolina

Scale: 1"=400'

Prep. By: CKC

Rev. By: TRW

Date: 5/7/2013



Figure 2

Tables

TABLE 1
SUMMARY OF GROUNDWATER ELEVATIONS

Location	MW-4	MW-5	MW-6	MW-7	MW-9	MW-10	MW-11	MW-12	MW-13	MW-14
TOC Elevation	345.90	351.10	402.10	360.30	384.20	377.00	399.60	337.40	363.93	358.61
Well Depth	19.00	19.50	40.40	22.17	22.85	22.80	22.75	13.30	24.25	18.25
24-Apr-09	336.60	NM	393.46	351.82	377.27	369.77	390.44	333.59	355.87	352.89
24-Nov-09	335.10	344.85	393.15	351.45	375.05	369.05	389.05	333.75	354.69	351.83
09-Apr-10	337.10	344.90	392.68	351.75	376.44	369.67	390.30	333.85	355.98	352.91
04-Oct-10	330.59	344.55	392.16	349.24	374.82	367.84	388.54	332.98	353.38	350.52
15-Apr-11	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10-Oct-11	DRY	341.64	391.18	347.76	370.56	363.44	383.59	328.87	348.94	347.68
18-Oct-12	331.62	344.35	392.48	349.73	374.91	367.55	387.62	332.50	353.19	350.71
17-Apr-13	335.45	344.80	392.55	351.87	375.92	369.61	389.65	333.62	356.24	352.48

Notes:

1. Water levels are measured from top of casing (TOC).
2. NM = Not monitored.
2. NA = Not available.
4. DRY = Monitoring well was dry.

TABLE 2

SUMMARY OF DETECTED CONSTITUENTS – GROUNDWATER

Analytical Method >			3050	3050	3050	3050	8260	8260	8260	8260	8260	8260	8260	8260
Well ID	Contaminant of Concern >		Arsenic	Barium	Chromium	Lead	Benzene	1-1 Dichloroethane	1,2 Dichlorobenzene	1,4 Dichlorobenzene	Chlorobenzene	Chloroethane	Meyhylene Chloride	Toluene
	Date Collected m/dd/yy	Sample ID												
MW-5	4/17/13	MW-5	10.5	478	26.3	35.6	ND	ND	ND	ND	ND	ND	ND	ND
MW-6	4/17/13	MW-6	5.08	113	2.73	4.59	ND	ND	ND	ND	ND	ND	ND	ND
MW-9	4/17/13	MW-9	ND	120	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10	4/17/13	MW-10	6.34	97.3	2.84	5.48	ND	ND	ND	ND	ND	ND	ND	ND
MW-12	4/17/13	MW-12	ND	1,560	3.69	5.76	4.9	4.3	ND	4.9	25	40	0.42	0.46
MW-14	4/17/13	MW-14	ND	185	7.62	27.8	ND	ND	ND	ND	ND	ND	ND	ND
SW-2	4/17/13	SW-2	ND	86.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Field Blank	4/17/13	Field Blank	3.36	1.52	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trip Blank	4/17/13	Trip Blank	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2L Standard (ug/l)			10	700	10	15	1	6	20	6	50	3,000	5	600

Results are in ug/l

Bold results indicate exceedence of 2L Standards

TABLE 2

SUMMARY OF DETECTED CONSTITUENTS – GROUNDWATER

Analytical Method >			3050	3050	3050	8260							
Well ID	Contaminant of Concern >		Cadmium	Selenium	Silver	Total Xylenes							
	Date Collected m/dd/yy	Sample ID											
MW-5	4/17/13	MW-5	0.854	7.68	ND	ND							
MW-6	4/17/13	MW-6	ND	ND	ND	ND							
MW-9	4/17/13	MW-9	ND	ND	ND	ND							
MW-10	4/17/13	MW-10	0.389	ND	ND	ND							
MW-12	4/17/13	MW-12	ND	8.05	3.03	0.48							
MW-14	4/17/13	MW-14	ND	ND	ND	ND							
SW-2	4/17/13	SW-2	ND	ND	ND	ND							
Field Blank	4/17/13	Field Blank	0.391	ND	ND	ND							
Trip Blank	4/17/13	Trip Blank	ND	ND	ND	ND							
2L Standard (ug/l)			2.0	20	20	500							

Results are in ug/l

Bold results indicate exceedence of 2L Standards