

**MAY 2011**  
**SEMI-ANNUAL GROUNDWATER AND**  
**SURFACE WATER MONITORING REPORT**

City of Durham  
Closed Municipal Solid Waste Landfill  
Durham County, North Carolina  
(DWM Permit No. 32-01)  
S&ME Project Number 1054-07-469

Prepared for:



CITY OF DURHAM  
DEPARTMENT OF WATER MANAGEMENT  
1600 MIST LAKE DRIVE  
DURHAM, NORTH CAROLINA 27704

Prepared by:



3201 Spring Forest Road  
Raleigh, North Carolina 27616

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Gerald Paul  
Environmental Staff Professional

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Samuel P. Watts, P.G.  
Senior Project Manager

October 25, 2011

NC DENR  
Division of Waste Management - Solid Waste

**Environmental Monitoring  
Reporting Form**

**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)).
- In accordance with NC General Statutes Chapter 89C and 89E and NC Solid Waste Management Rules 15A NCAC 13B, be sure to affix a seal to the bottom of this page, when applicable.
- 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):

S&ME, Inc.

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

Name: Sam Watts, P.G.

Phone: (919) 872-2660

E-mail: swatts@smeinc.com

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)
City of Durham - Closed Municipal Solid Waste Landfill	City of Durham Department of Water Management 1600 Mist Lake Drive Durham, NC 27704	32-01	.1600	May 19, 2010

**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.

Samuel P. Watts, P.G.

Senior Project Manager

(919) 872-2660

Facility Representative Name (Print)

Title

(Area Code) Telephone Number

Signature

October 28, 2011

Date

Affix NC Licensed/Professional Geologist/Engineer Seal here:



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## 1.0 INTRODUCTION

This report summarizes the monitoring results from the May 19, 2011 semi-annual groundwater and surface monitoring event at the City of Durham Closed Landfill in Durham County, North Carolina. The monitoring event was performed in accordance with Title 15A of the North Carolina Administrative Code (NCAC) Subchapter 13B.1632. The City of Durham Landfill is a closed municipal solid waste (MSW) landfill and is maintained by the City of Durham Department of Water Management under Permit No. 32-01 issued by the North Carolina Department of Environment and Natural Resources, Division of Waste Management (NCDENR-DWM).

### 1.1 Site Description and Background

The subject property is a closed, unlined MSW landfill that ceased accepting wastes in 1997. The vicinity location of the facility is shown on **Figure 1**, with more details of the location and the immediate area shown on **Figure 2**. The landfill is located northeast of downtown Durham, near the North Durham Water Reclamation Facility off East Club Boulevard at Glenn Road.

According to the topographic map, elevations at the facility range from approximately 280 to 380 feet above mean sea level. In general, surface drainage from the facility and surrounding areas is routed by drainage channels and stormwater control structures toward Ellerbe Creek to the west of the landfill. Surface water flows off and away from the closed and capped landfill in a radial direction, toward unnamed streams to the northeast, south and west. These streams are tributaries of Ellerbe Creek, which flows into Falls Lake, located approximately 4.5 miles to the northeast of the landfill.

### 1.2 Compliance Monitoring History

Groundwater quality at the landfill has been monitored since 1989 and is currently monitored semiannually in accordance with the approved Water Quality Monitoring Plan (WQMP) prepared by Malcolm Pirnie Inc., in April 1994 (MP, 1994). Assessment Monitoring was conducted for the landfill from November 1996 through June 1999 after the detection of benzene collected from monitor well MW-6R sample. Following the June 1999 monitoring event, the NCDENR Solid Waste Section (Section) granted approval for the City to return to Detection Monitoring. Detection Monitoring was conducted for the site from October 1999 through December 2004. At that time, based on additional detections of volatile organic compounds (VOCs), Assessment Monitoring was resumed during the June 2005 monitoring event (Weston, 2006). Beginning with the November 2007 sampling event, a modified Assessment Monitoring protocol has been used, which generally alternates between analyses for the Appendix I constituent list during the fall sampling event and the Appendix II constituent during the spring sampling event.

In May 2008, monitor well MW-9R replaced monitor well PZ-6 as the upgradient/background monitor well due to the poor water quality and elevated metals concentrations detected in the background well (PZ-6). Also in May 2008, monitor well MW-3R replaced MW-3 as a downgradient compliance monitoring well due to the determination that MW-3 was located in or in close proximity to the landfill waste boundary. Prior to inclusion into the groundwater monitoring network, both wells (MW-3R and MW-9R) were sampled once for the full Appendix I list of constituents plus Appendix II semi-volatile organic compounds (SVOC) constituents on May 1, 2008 to assess groundwater quality at these locations.

As indicated in the *May 2008-Groundwater Monitoring Report – Semi-Annual Monitoring of Groundwater and Surface Water* (S&ME, July 2008), downgradient monitor well MW-6R appears to be located in or in close proximity to the landfill waste boundary, and may not accurately reflect true groundwater quality within the uppermost aquifer. Additionally, due to its close proximity to buried waste, monitor well MW-6R does not meet the requirements listed under Section .1631(a) of the Solid Waste Rules (15A NCAC 13B) as well as EPA’s RCRA Technical Enforcement Guidance Document (TEGD) SW-846. As a result, MW-6R was removed from the groundwater monitoring network. MW-6R will remain in place and will be utilized to collect groundwater levels to assist in the determination of groundwater flow characteristics.

On August 20, 2008, S&ME installed a new compliance monitor well (MW-10) in the vicinity of the former compliance well (MW-6R) beyond the waste boundary. On September 9, 2008, MW-10 was sampled and the results of the sampling were summarized in S&ME’s report *Monitoring Well Installation Report*, dated October 2, 2008, included in Appendix IV of the *November 2008 Semi-Annual Monitoring of Groundwater and Surface Water*. The locations of MW-3, MW-3R, MW-6R and MW-10 in relation to the approximate limits of the waste boundary are shown on **Figure 3**. The City is currently evaluating the location of monitor well MW-10 for compliance monitoring.

A nature and extent study (NES) is currently being conducted along the western boundary of the landfill in response to groundwater constituent concentrations detected above 2L Standards in monitor well MW-10. As part of this assessment seven temporary piezometers and three stream gauges were installed in the vicinity of MW-10. Sampling and analysis results collected from the nature and extent study are not included as part of this semi-annual monitoring report, but will be submitted in a separate report. One of the piezometers installed as part of the NES (NES-3) was sampled during the November 2010 semiannual sampling event to establish a water quality baseline for the possible replacement of compliance well for MW-10.

On January 21, 2011, S&ME installed a new monitor well (MW-11) in the vicinity of the former compliance well (MW-5) beyond the waste boundary. The new well was installed approximately 90 feet beyond the apparent edge of waste as a possible replacement for MW-5 due to historical detections of barium above the NCAC 2L Standards in monitor well MW-5.

On February 2, 2011, S&ME personnel collected one groundwater sample from the new monitor well (MW-11). The sample was analyzed for Appendix I metals of which previous detections above the NCAC 2L Standards were detected in the former compliance monitor well (MW-5). Only one inorganic compound (metal) was detected above the 2L Standard in the new compliance well MW-11.

- Barium (1,050 µg/L) exceeded the 2L Standard (700 µg/L).

Nickel (4.39 µg/L) and selenium (1.50 µg/L) were detected above the laboratory method detection limits (MDLs) but below their respective 2L Standards in the MW-11 sample. As a point of reference, the results are compared to the analytical data for the monitor well MW-5 (November 2010).

Subchapter 13B of 15A NCAC is referred to as the “Solid Waste Rules” and govern the post closure monitoring requirements for the City of Durham closed MSW landfill. 13B .1631 provides guidance on the groundwater monitoring system for landfills. According to .1631(a)(2) a down-gradient groundwater monitor well shall be installed at the relevant point of compliance for a landfill. The relative point of compliance shall be established no more than 250 feet from a waste boundary and shall be at least 50 feet within the facility property boundary. As shown in **Figure 3**, monitor well MW-5 and the new monitor well MW-11 are located well within the 250 feet compliance boundary. A brief letter report documenting the installation of MW-11 and the results of water quality sampling and analysis from MW-11 is included in **Appendix V**. Laboratory analysis of the groundwater sample collected from MW-11 in February 2011 detected barium at 1,050 µg/l, above the 2L Standard of 700 µg/l. Monitor well MW-11 was included as part of the May 2011 sampling event to corroborate the results of the sampling conducted from this well in February 2011.

On May 12, 2011, S&ME submitted a request to NCDENR on behalf of the City of Durham to reduce the number of superfluous up-gradient monitor wells from the semi-annual sampling schedule. On May 17, 2011, S&ME received a response from NCDENR granting approval of the reduced sampling schedule to remove monitor wells MW-7R and MW-8 compliance well sampling list.

The facility’s water quality monitoring network consists of 15 monitor wells/piezometers and four surface water locations. Sample locations are depicted on **Figure 3**. Of the 15 wells/piezometers at the site, nine (9) are used to measure water levels only. The six (6) wells used to collect water quality samples for laboratory analysis consist of one up-gradient/background monitor well (MW-9R) and seven down-gradient compliance monitor wells (MW-2, MW-3R, MW-4R, MW-5, and MW-10). These compliance wells monitor the uppermost aquifer. For the May 2011 groundwater monitoring event, the collected groundwater samples from all wells were analyzed for the North Carolina Appendix I constituents. The facility’s monitoring network also includes one upstream surface water monitoring point (S-4) and three downstream surface water sampling points (S-1, S-2 and S-3), which are sampled in conjunction with the groundwater monitor wells

during the semi-annual groundwater monitoring events. Surface water samples are analyzed semiannually for NC Appendix I constituents.

### 1.3 Hydrogeologic Setting

The facility is located within the Piedmont Physiographic Province of North Carolina and geologically within the Durham Triassic Basin (North Carolina Geological Survey, 1985). The Durham Basin is included in the Chatham Group of Triassic sediments, which include sandstones, mudstones, conglomerates and unconsolidated sediments occurring from the erosion of adjoining Piedmont Metavolcanic Rocks. The uppermost aquifer beneath the facility is unconfined and located within soil, saprolite and weathered rock, which transitions into arkosic sandstone, siltstone and mudstone bedrock of the Triassic-aged Pekin Formation. Site monitor wells are screened in the uppermost pervasive aquifer contained within silty sands, silty to sandy clays, and sandstones of the Triassic saprolite soils and weathered rock at the site.

The depth to groundwater typically ranges from approximately 4 feet below grade along the western and southern perimeter of the facility to nearly 50 feet below grade in the central and eastern portion of the facility. Historical static water level data are presented on **Table 1**. As shown by the historical water level data, the hydraulic head level within the uppermost aquifer beneath the facility is fairly consistent. The range in static water elevation fluctuation is greater in the upgradient well, which is more centrally located to the regional groundwater recharge area. The reduction in range of fluctuation in the downgradient compliance wells, which are generally located to the west nearer groundwater discharge areas, is likely due to the stabilizing affect of hydraulic discharge boundaries.

Static water level measurements obtained on May 19, 2011, were used to prepare the groundwater potentiometric map presented as **Figure 3**. As shown by the potentiometric contours, groundwater flow across the majority of the site is projected radially to the north, northwest, and west, which is consistent with previous groundwater data. Based on the May 19, 2011 groundwater potentiometric map, the hydraulic gradient in the uppermost aquifer underlying the site was measured along the projected flow paths shown on **Figure 3**. The average hydraulic gradient for the groundwater flow was calculated to be approximately 0.035 feet/foot (**Table 2**). An estimated effective porosity of 20% was used for the uppermost aquifer (Heath, 2001). Using the above values, the estimated rate of groundwater seepage flow within the monitored zone of the uppermost aquifer beneath the facility was calculated using the following modified Darcy equation:

$$V_{gw} = K_i/ne$$

Where values are equal to the following:

- $V_{gw}$  = average seepage velocity (feet/year),
- $K$  = hydraulic conductivity (feet/year),
- $i$  = horizontal hydraulic gradient, and
- $ne$  = effective porosity.

The value for effective porosity ( $n_e$ ) was based on estimates from Malcolm Pirnie, Inc's *City of Durham Sanitary Landfill Water Quality Monitoring plan, dated April 1994*. The values for hydraulic conductivity (K) were based on estimates from S&ME's *Monitoring Report, Semi-Annual Monitoring of Groundwater and Surface Water, dated July 30, 2008*. The average calculated groundwater flow seepage velocity under the waste management unit is approximately 9.69 feet/year to the west/northwest (**Table 2**).

#### **1.4 Maintenance Activities**

Since the last monitoring event in November 2010, the following maintenance activities have been conducted at the site:

1. Replaced the bladder pump in MW-8 – During the November 2010 semiannual sampling event, the bladder pump installed in MW-8 failed to operate. At the time of sampling, the bladder pump was removed from the well and transported back to the S&ME maintenance shop for repairs. The check valve was removed from the pump, cleaned and replaced for proper operation. The bladder pump was disassembled and decontaminated to avoid cross-contamination. On May 19, 2011, S&ME personnel re-installed the bladder pump in monitor well MW-8.

## **2.0 FIELD PROGRAM, MONITORING RESULTS, AND DISCUSSION**

Field activities conducted as part of the May 2011 sampling event are discussed in the following sections.

### **2.1 Visual Inspection/Maintenance Activities**

Monitor wells at the City of Durham Closed Landfill are visually inspected for integrity and access obstructions to sampling. At each monitor well, the following items were checked:

- Surface water is diverted away from the well head.
- The concrete pad is in tact and free of cracks.
- The outer casing is secured and locked.
- The well identification is legible
- The inner well casing is firmly grouted in place.
- The inner and outer well casings remain upright and unobstructed.
- Monitor wells are visible and adequately protected from moving equipment and obstruction due to brush and weeds.

During the May 2011 compliance monitoring event the 15 monitor wells/piezometers were found to be in good condition.

### **2.2 Monitoring Well Network**

The facility's water quality monitoring network consists of 15 monitor wells/piezometers and four surface water locations. The locations of all monitor wells and piezometers are depicted on **Figure 3**. Of the 15 wells/piezometers at the site, nine (9) are used to measure water levels only. The six (6) wells used to collect water quality samples for laboratory analysis consist of one upgradient/background monitor well (MW-9R) and five down-gradient compliance monitor wells (MW-2, MW-3R, MW-4R, MW-5, and MW-10). These compliance wells monitor the uppermost aquifer. For the May 2011 groundwater monitoring event, the collected groundwater samples from all wells were analyzed for the North Carolina Appendix I constituents. The facility's monitoring network also includes one upstream surface water monitoring point (S-4) and three downstream surface water sampling points (S-1, S-2 and S-3), which are sampled in conjunction with the groundwater monitor wells during the semi-annual groundwater monitoring events. As previously mentioned, monitor well MW-11 was sampled for Appendix I metals only during the May 2011 semi-annual sampling event to confirm previous concentrations of barium in the vicinity of MW-5. Surface water samples are analyzed semiannually for NC Appendix I constituents.

### 2.3 May 2011 Sampling Event

Groundwater monitor well locations and surface water sampling locations for the May 2011 sampling event are depicted on **Figure 3**. A discussion of field sampling methods and locations for the May 2011 groundwater sampling event is provided below. S&ME personnel performed sampling at the facility in accordance with the Solid Waste Rules and the facility's *Water Quality Monitoring Plan (WQMP)*, dated April 1994.

Prior to initiating purging and sampling activities, the wells were opened, allowed to equilibrate with atmospheric pressure and depth-to-water measurements were recorded to the nearest 0.01 foot using an electronic water level indicator. The electronic water level indicator was decontaminated before its initial use and between measurements at each well location. Field personnel wore clean protective/non-reactive gloves at each well location when collecting water level measurements. In addition to the sampled wells, the depth to static groundwater was also measured in monitor wells MW-3, MW-6R, MW-7R, MW-8, MW-11, PZ-2R, PZ-3, PZ-4R and PZ-6 to provide additional data points for construction of the groundwater potentiometric map. The resulting water level elevations for this event were added to the historical water elevation data presented in **Table 1**.

Following the collection of static groundwater level measurements, monitor wells to be sampled were purged utilizing the dedicated bladder pumps installed in each well. As purging proceeded, pH, temperature, specific conductivity, dissolved oxygen, and turbidity were measured and recorded by S&ME field personnel. Purging was considered complete at each well after the field parameters fluctuated no more than 10 percent between measurements. The field parameters measured immediately before collecting each groundwater sample is presented in **Table 5**. One blind duplicate groundwater sample set was collected from MW-10 for sample Quality Assurance/Quality Control (QA/QC).

After purging was complete, groundwater samples were collected in new laboratory-supplied sample containers. Prior to sample collection, the sample containers were labeled with the sample identification number, sampling personnel, date and time of sample collection, project name and number, and requested chemical analyses. The required groundwater samples were collected directly from the bladder pump tubing into the labeled sample containers, closed and placed in a cooler on ice, under chain-of-custody control. Copies of the sampling logs are presented in **Appendix I**. Included in each log is a description of the sampling equipment, sampling method, field observations, and field parameter water quality measurements.

In addition to the groundwater samples, surface water samples were collected from locations S-4 (upstream), S-1, S-2 and S-2 (downstream) on May 19, 2011. The surface water samples were collected by lowering the sample containers into the stream with the opening facing into the current flow, taking care to prevent overflow of the sample containers and to reduce the potential of collecting a turbid sample.

The groundwater and surface water samples were submitted to Environmental Conservation Laboratories, Inc. (ENCO) of Cary, North Carolina on May 19, 2011, under chain-of-custody protocols. The groundwater samples (MW-2, MW-3R, MW-4R, MW-5, MW-9R and MW-10) were submitted for analysis of NC Appendix I constituents. The groundwater sample (MW-11) was submitted for analysis of NC Appendix I constituents (metals only). The surface water samples (S-1, S-2, S-3 and S-4) were analyzed for NC Appendix I constituents. The results of analytical testing are discussed in **Section 2.4** and a summary of compound concentrations detected during the May 2011 sampling event are presented in **Table 4**. A copy of the analytical laboratory report is provided in **Appendix II**.

## **2.4 Groundwater Quality**

### *2.4.1 Methods and Standards*

The NCDENR-Division of Waste Management (DWM) has established groundwater quality criteria, termed the Solid Waste Section Limit (SWSL) regarding the detection of constituents in groundwater at levels below the previously used Practical Quantitation Limits (PQLs). The SWSL is defined as the lowest amount of analyte in a sample that can be quantitatively determined with suitable precision and accuracy (i.e. repeatable results) and is the concentration below which reported analytical results must be qualified as estimated. The SWSL is the updated version of the PQL that appears in older North Carolina Solid Waste Section literature. The SWSL is the limit established by the laboratory survey conducted by the North Carolina Solid Waste Section. The Section also requires that laboratories report analytical results to the Method Detection Limits (MDLs) rather than the SWSL.

In reference to the constituents detected during this sampling event, the new SWSLs and MDLs are lower than the previous PQLs. For this reason, several constituents that have not been reported as detected prior to 2007 were reported as detected in the subsequent sampling events. In our opinion, these findings generally are not indicative of an increase in the presence of these constituents in the groundwater, but rather are due to changes in the reporting and evaluation limits.

### *2.4.2 Groundwater Analytical Data*

Constituent concentrations detected in the groundwater samples above the laboratory MDLs are summarized on **Table 4**. For comparison purposes, these results are shown with their respective SWSL and 15A NCAC Subchapter 2L .0200 Groundwater Quality Standards (2L Standards). Where target groundwater constituents have no established 2L Standard, the analytical results were compared to the Solid Waste Section Groundwater Protection (GWP) Standard.

**Volatiles** No volatile organic compounds (VOCs) were detected above the MDL in the groundwater sample collected from up-gradient (background) well MW-9R. In the down-gradient (compliance) monitor wells VOCs detected above the MDL in the groundwater sample from MW-10. Eight VOCs were detected above the MDL in the groundwater sample from MW-10: benzene, 1,4-dichlorobenzene, 1,1-dichloroethane, cis-1,2-dichloroethene, trans-1,2-dichloroethene, 1,2-dichloropropane, trichloroethene, and vinyl chloride. However, the reported concentration of 1,4-dichlorobenzene (0.98 µg/l), 1,1-dichloroethane (3.2 µg/l) and trans-1,2-dichloroethene (4.2 µg/l) were “J” qualified and are considered to be a positive identification of a constituent with unreliable certainty as to the reported concentrations. Of the eight VOCs detected in MW-10, the following were reported above their respective 2L Standards:

- 1,2-Dichloropropane (2.2 µg/L) exceeded the 2L Standard (0.6 µg/L).
- Cis-1,2-Dichloroethene (110 µg/L) exceeded the 2L Standard (70 µg/L).
- Trichloroethene (12 µg/L) exceeded the 2L Standard (3.0 µg/L).
- Vinyl chloride (12 µg/L) exceeded the 2L Standard (0.03 µg/L).
- Benzene (1.7 µg/L) exceeded the 2L Standard (1.0 µg/L).

There were no other VOCs detected in any of the other compliance well groundwater samples above the method detection limits (**Table 4**).

It is important to note that the laboratory method detection limit (MDL) for vinyl chloride is 0.6 µg/L. Although this MDL is less than the SWSL of 1 µg/L, it is greater than the 2L Standard of 0.03 µg/L. Therefore, vinyl chloride may have been present at concentrations above the 2L Standard but at concentrations below the MDL.

**Inorganics** Barium, cobalt and vanadium were the only inorganic constituents detected above a 2L or GWP Standard in the groundwater samples collected during the May 2011 groundwater monitoring event. Barium was detected at 1,860 µg/L in the sample collected from monitor well MW-5 and at 1,120 in the sample collected from monitor well MW-11 (replacement well for MW-5) above the 2L Standard of 700 µg/L.

Cobalt was detected at 6.93 µg/L in the sample collected from background monitor well MW-9R. Cobalt was also detected in the compliance monitor wells MW-3R at 1.70 µg/L, MW-10 at 5.31 µg/L and in monitor well MW-11 at 2.16 µg/L above the GWP Standard of 1.0 µg/L. These detections were reported with “J” laboratory qualifiers, and may not be considered detections.

Vanadium was detected above the GWP Standard of 0.3 µg/L in the in compliance monitor wells MW-2 at 3.86 µg/L, MW-3R at 1.47 µg/L and MW-10 at 3.89 µg/L. These detections were reported with “J” laboratory qualifiers, and are considered to be a positive identification of a constituent with unreliable certainty as to the reported concentrations.

It is important to note that the laboratory method detection limits (MDLs) for cobalt and vanadium are 1.1 µg/L and 1.4 µg/L, respectively. Although the MDLs are less than the SWSLs of 10 µg/L and 25 µg/L, they are greater than their respective Groundwater Protection Standards of 1.0 µg/L and 0.3 µg/L. Therefore, cobalt and vanadium may have been present at concentrations above the groundwater protection Standards but not reported above the MDL.

In other groundwater samples, detected concentrations of metals were reported below their respective 2L or GWP Standards.

Site groundwater samples have been analyzed for both total metals and dissolved metals since June 1996. The purpose of the dissolved analyses has been to provide additional data for interpretation of total metals results. Analysis of total metals provides the level of both dissolved and mobile particulate-associated metals available for potential transport. Typically, a dissolved (filtered) metal determination is less than its concentration as a total (unfiltered) metal, indicating that mobile particulates, removed by filtering for the dissolved analysis, contribute to the total concentration. A high total metals result paired with a low to non-detectable dissolved metals result suggests that the total metal concentration reported by the laboratory may be the result of turbidity (suspended solids) in the sample. Mobile particulates are frequently present in groundwater with high turbidity, such as has been previously observed in groundwater sampled from several of the site wells, including MW-3R and MW-9R (**Table 5**). The replacement of the dedicated bladder pumps and redevelopment of the monitor wells in April 2008 has resulted in lower turbidity levels.

During the May 2011 sampling event no samples were selected and analyzed for dissolved metals.

### *2.4.3 Surface Water Analytical Data*

As specified by the facility *Water Quality Monitoring Plan*, four surface water sampling locations have been established at the facility (**Figure 3**). Two surface water locations are located along ditches/intermittent streams (S-1 and S-2) and are established to monitor water quality downstream of the facility. Two surface water locations are situated along Ellerbe Creek (S-3 and S-4). S-3 is established to monitor water quality in Ellerbe Creek downstream of the facility. S-4 is established to monitor water quality in Ellerbe Creek upstream of the facility.

#### **Volatiles**

In May 2011, samples were collected at surface water sampling points S-1, S-2, S-3 and S-4. The surface water samples were analyzed for Appendix I VOCs by EPA Method 8260B and Appendix I metals by EPA Method 6010B. **Table 4** summarizes the results of the surface water analysis for the May 2011 sampling event in comparison with 2B Standards (15A NCAC Subchapter 2B .0200 Surface Water Quality Standards). No

organic constituents were detected above their respective MDLs during the May 2011 semi-annual sampling event. The historical surface water organic constituent data for the current and previous sampling events are summarized in **Table 5**.

### **Inorganics**

The inorganic constituents antimony, arsenic, barium, beryllium, chromium, cobalt, copper, lead, nickel, selenium, vanadium and zinc were detected above their MDLs in one or more samples from both the upstream (S-4) and downstream (S-1, S-2 and S-3) surface water monitoring locations during the May 2011 monitoring event (**Table 4**). The detected concentrations of inorganic constituents in the downstream samples were similar to the concentrations in the upstream samples. With the exceptions of barium in S-1 and zinc in S-2 and S-3, all detections were reported with a “J” laboratory qualifier indicating that the values are estimated concentrations below the lowest calibration point and are considered to be a positive identification of a constituent with unreliable certainty as to the reported concentrations. All inorganic constituents were detected at reported concentrations less than their respective 2B Standards. The historic surface water inorganic constituent data is summarized in **Table 6**.

### **3.0 LABORATORY AND FIELD QA/QC**

One blind duplicate/replicate groundwater sample set was collected from monitor well MW-10. The duplicate sample collected from MW-10 was labeled 3201-Duplicate on the laboratory chain of custody. The concentrations of the VOCs and inorganic constituents detected in the duplicate/replicate sample from MW-10 were similar to the record sample.

The groundwater sample from monitor well MW-11 was analyzed for NC Appendix I constituents (metals only) during the May 2011 sampling event to corroborate the results of the sampling conducted from this well in February 2011.

One equipment blank was collected by S&ME personnel as part of the May 2011 groundwater sampling event. The equipment blank was collected by pumping laboratory-supplied de-ionized water directly from laboratory supplied containers through new, disposable Teflon tubing and silicon tubing using a peristaltic pump. The de-ionized water was then pumped across an electronic water level indicator and collected into the laboratory sample containers. The equipment blank was analyzed for NC Appendix I constituents. No VOCs were detected above the method detection limit in the equipment blank; however, two inorganic constituents (barium and zinc) were detected above the MDL. The detected concentrations of barium (1.14 µg/L) and zinc (4.26 µg/L) in the equipment blank was reported with a “J” laboratory qualifier indicating that the value is an estimated concentration below the lowest calibration point.

A laboratory-prepared trip blank accompanied the sample containers to and from the laboratory. The trip blank was analyzed for Appendix I VOCs. No VOCs were detected in the trip blank included in the May 2011 sampling event.

## 4.0 DISCUSSION OF GROUNDWATER DETECTIONS

### 4.1 Application of Statistical Analysis

A statistical analysis of the historical water quality analytical data was performed as part of the May 2011 semiannual monitoring event. Previous sampling events did not include a statistical analysis of the data.

According to 15A NCAC 13B .1633 (Detection Monitoring), when concentrations are detected in one or more downgradient monitor wells at levels above their respective SWSLs, these concentrations may be statistically evaluated in accordance with the procedures outlined in 15A NCAC 13B.1632(g) and (h) to determine if the reported concentrations exceeded the facility background concentration.

During the 2007 groundwater monitoring year, the NCDENR-DWM promulgated revised Solid Waste Section Limits (SWSLs), which replaced the former Practical Quantitation Limit (PQL) for all Appendix I and Appendix II constituents. The newly promulgated SWSLs were based on updated toxicological data and were not based on EPA analytical methodology employed by the certified laboratories throughout North Carolina for groundwater analyses. The EPA Analytical Methods used by the laboratories to detect constituents in groundwater have a finite method detection limit (MDL). Constituent concentrations below the MDL will be reported as non-detect (ND). The intent of the SWSL as well as the former PQL is to define the lowest possible concentration of a particular constituent that can be repeated with reasonable accuracy over multiple analyses of the same sample using the same analytical methodology at the laboratory. Values detected below the SWSL are considered estimated values, which may show a different result if the analysis was repeated on the same sample.

In reference to the constituents detected from the May 2007 to the November 2010 semi-annual sampling events, the new SWSLs and MDLs are lower than the previous PQLs. For these reasons, several constituents that have not been reported as detected prior to 2007 were reported as detected in the subsequent sampling events. In our opinion, these findings are not indicative of an increase in the presence of these constituents in the groundwater but rather are due to changes in the reporting and evaluation standards. As a result, a new baseline of background concentrations of the monitored constituents using the lower SWSLs and MDLs should be conducted to “re-establish” background water quality at the facility.

In accordance with Section .1634 (b), it is recommended that a minimum of four independent samples be collected from each well (background and downgradient) to establish background for the newly detected constituents for statistical analysis. However, in order to calculate statistical Upper Limits required by 15A NCAC 13B.1633, EPA’s Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Addendum to Interim Final Guidance document recommends a minimum of eight (8) background samples for a parametrically distributed background data set. For non-parametrically distributed background data sets the same guidance by EPA

recommends a minimum of thirteen (13) background samples for computation of statistical Upper Limits. These minimum sample set sizes are recommended in order to provide adequate statistical power for a 95% Prediction or Tolerance Interval test. At the time of the November 2010 groundwater monitoring event, only seven (8) background samples had been collected under the new SWSLs for use in calculating statistical Upper Limits. At least two additional sampling events are recommended to “re-establish” background conditions for use in statistical Upper Limits computations.

In accordance with Sections .1632, .1633, and .1634 of the Solid Waste Rules, statistical analyses were applied to the May 2011 analytical results. Those analytes detected during the May 2011 sampling events were reviewed and analyzed in comparison to previous sampling results from the City of Durham Closed Landfill. This method was used in order to evaluate trends and changes in the sampling results as well as statistically significant differences between upgradient and downgradient wells.

The data set used to evaluate the May 2011 detections at the City of Durham Closed Landfill includes eight groundwater sampling events completed between November 2007 and May 2011. Since several wells were abandoned or replaced during this time period, S&ME selected data from one existing background well (MW-9R) and data from five existing compliance wells (MW-2, MW-3R, MW-4R, MW-5, and MW-10) located at the City of Durham Closed Landfill to use in the statistical analyses.

#### **4.2 North Carolina Groundwater and Surface Water Quality Standard Comparisons**

Five VOCs, benzene, cis-1,2-dichloroethene, 1,2-dichloropropane, trichloroethene and vinyl chloride were detected above their respective 2L Standards in MW-10 during the May 2011 event. The inorganic constituent barium was detected above its respective 2L Standard in MW-5 and in the new monitor well (MW-11) during the May 2011 event. Vanadium was detected above its respective GWP Standard in the compliance monitor wells MW-2, MW-3R and MW-10. Cobalt was detected above its respective GWP Standard in the background monitor well MW-9R and in compliance monitor wells MW-3R, MW-10 and in MW-11. All detections of vanadium and cobalt were reported with a “J” laboratory qualifier indicating that the values are estimated concentrations below the lowest calibration point and are considered to be a positive identification of a constituent with unreliable certainty as to the reported concentrations.

No other organic or inorganic constituents were detected in groundwater above their respective 2L or GWP Standards during this event. Monitor well MW-10 is well within the facility compliance boundary. The wooded area down gradient from MW-10 offers adequate space to re-locate the compliance monitor well in accordance with 13B .1631(a)(2)(a) (i.e. no more than 250 feet from a waste boundary, and at least 50 feet within the facility property boundary). Monitor well MW-5 and MW-11 are also well within the facility compliance boundary. The wooded area down gradient from MW-5 and MW-11 also offers adequate space to re-locate the compliance monitoring point. As

previously mentioned, monitor well MW-11 was installed down gradient of MW-5 to assess groundwater as a possible replacement for compliance monitor well MW-5. However, the constituent of concern (barium) was also detected at this sample location above the 2L Standard and indicates that the replacement well needs to be placed beyond this point.

No VOCs were detected in any of the surface water samples above the 2B Standards. Several inorganic constituents were detected above the laboratory MDL, but below their applicable 2B Standards in both the upstream and downstream samples. Inorganic concentrations are consistent with historical concentrations in the surface water and do not indicate an impact to surface water by the facility.

### 4.3 Statistical Analysis

Analyses of historical data provided insight into the dynamics of the analytes detected during the May 2011 monitoring event. After the May 2011 monitoring event, a sufficient number of monitoring events were captured for the use of statistical procedures to evaluate trends in groundwater quality. This statistical evaluation used a step-wise approach to identify potential releases from the landfill.

#### 4.3.1 Evaluation of Non-Detected Values

First, the data was evaluated for non-detected values. Our analyses showed that most of the data for the landfill contains more than 70 percent non-detected results for individual analytes. However, the data set contains 0 percent non-detected results for one inorganic compound, barium. A summary of the non-detected results used to select the statistical analyses (the Wilcoxon Rank-Sum Test or Parametric T-Test) is shown on **Table 7**.

#### 4.3.2 Results of the Wilcoxon Rank Sum Test

The application of the Wilcoxon Rank-Sum Test (WRST) was the second step in the statistical analyses. Due to the large number of non-detected values, the WRST, a non-parametric statistical analysis, was used to compare individual downgradient or compliance wells to the upgradient or background well. This analysis was performed on data sets of Appendix I VOCs, Appendix I inorganic compounds (excluding barium), and three Appendix II compounds. However, statistical evidence at this level does not necessarily dictate non-compliance with regard to groundwater quality. The result of the WRST analyses for data from November 2007 to May 2011 is summarized in **Table 8**.

Evidence of a release from the landfill was found for several Appendix I VOCs and two inorganic constituents (nickel and zinc). Statistical evidence of a release is supported by the reported detections of VOCs in compliance well MW-10.

#### *4.3.3 Results of the Parametric T-Test*

Due to the absence of non-detected values for barium, the Parametric T-Test, was used to compare the individual downgradient or compliance well data to the upgradient or background well data. This analysis was performed on the barium data set only. However, statistical evidence at this level does not necessarily dictate non-compliance with regard to groundwater quality. The result of the Parametric T-Test analyses for data from November 2007 to May 2011 is summarized in **Table 9**.

Evidence of a release from the landfill was found for the inorganic compound barium. Statistical evidence of a release is supported by the reported detections of barium in compliance wells MW-2, MW-3R, MW-4R, MW-5, and MW-10.

#### *4.3.4 Comparison of 95% Upper Confidence Level to Groundwater Standards Using Background and Compliance Well Locations*

To assess the landfill as a potential source of identified constituents of concern (COCs), the data from the background and compliance wells were pooled into a single dataset and statistically evaluated to compare individual COCs to their respective groundwater quality standards. Using the Two-Tailed Test of Proportions non-parametric procedure, a comparison of the analytes (excluding barium) with statistical evidence of a release at the 95% upper predictive limit (UPL) was compared to their respective 2L Standard/GWPST for well locations MW-3R (nickel) and MW-10 (VOCs & zinc). This comparison is summarized in **Table 10**. No individual analytes statistically exceeded their respective groundwater standards.

#### *4.3.5 Comparison of 95% Confidence Interval to Groundwater Standards at Individual Compliance Well Locations*

The pooled dataset for the entire landfill does not address individual compliance locations at the landfill. Therefore, to assess potential release areas within the landfill, each COC within individual compliance wells where evidence of a release was found (**Table 8**) was statistically compared to its respective 2L Standard. The Land's Formula Confidence Interval Maximum Contaminant Level (MCL) Test procedure was used to compare the analytes with statistical evidence of a release at the 95% upper confidence limit (UCL) then compared to its respective 2L Standard. This comparison is summarized in **Table 11**.

#### *4.3.6 Comparison of Tolerance Limit to Groundwater Standards*

Due to the absence of non-detected values for barium, the Parametric Tolerance Interval Analysis was used to compare the tolerance level for the data set for the inorganic compound barium to its respective 2L Standard. This comparison is summarized in **Table 12**. Barium statistically exceeded its respective groundwater standard at compliance monitor wells MW-3R, MW-4R, and MW-5.

#### 4.4 Qualitative Groundwater Review of Analytical Results

For those analytes detected during the May 2011 sampling event whose 95% UPL, 95% UCL, or tolerance level exceeds their respective groundwater standards, S&ME performed a trend analysis of the data and of time concentration graphs to assess whether groundwater quality was improving, degrading, or remaining constant.

Data entry and analysis was performed using the ChemStat® statistical software by Starpoint Software following EPA and DWM protocols for approved statistical analysis methods for groundwater data. The May 2011 data was entered into the historical source database for the site, and was reviewed and evaluated using the statistical analysis methods discussed in **Section 4.1**. Time series graphs for wells MW-3R, MW-4R, and MW-5 are graphical representations of data trends over time and are included in **Appendix IV** of this report. These time series graphs are of groundwater quality for those chemical constituents that; 1) were detected during the May 2011 sampling event, 2) resulted in significant evidence of a release, and 3) whose 95% UPL, 95% UCL, or tolerance level have exceeded its respective standard.

##### 4.4.1 Compliance Monitor Well MW-2

No constituents were detected in the sample collected from monitor well MW-2 above their respective SWSLs during the May 2011 sampling event. Therefore, no trend analyses were performed for monitor well MW-2.

##### 4.4.2 Compliance Monitor Well MW-3R

One organic compound (barium) was detected in the sample collected from monitor well MW-3R above its respective SWSL during the May 2011 sampling event. The inorganic compound nickel was detected in the sample collected from MW-3R during the May 2011 sampling event, but below its respective SWSL. Concentrations of barium and nickel have been detected consistently over time, and the tolerance level or 95% UCL for these detections at monitor well MW-3R exceed their respective 2L Standards. Therefore, trend analyses were performed for barium and nickel at monitor well MW-3R. A qualitative review of the trend graph for barium at MW-3R shows a trend of decreasing concentrations over time. The trend graph for nickel at monitor well MW-3R shows no evident trend of concentrations over time (see **Appendix IV**).

##### 4.4.3 Compliance Monitor Well MW-4R

Barium was detected in the sample collected from monitor well MW-4R above its respective SWSL during the May 2011 sampling event. Concentrations of barium have been detected consistently over time, and the tolerance level for these detections at the facility at monitor well MW-4R exceeds its respective groundwater standard. Therefore,

a trend analysis was performed for barium at monitor well MW-4R. A qualitative review of the trend graph (see **Appendix IV**) for barium at monitor well MW-4R shows no evident trend of concentrations over time.

#### *4.4.4 Compliance Monitor Well MW-5*

Barium, was detected in the sample collected from monitor well MW-5 above its respective SWSL during the May 2011 sampling event. Concentrations of barium have been detected consistently over time, and the tolerance level for these detections at the facility at monitor well MW-5 exceeds its respective groundwater standard. Therefore, a trend analysis was performed for barium at monitor well MW-5. A qualitative review of the trend graph (see **Appendix IV**) for barium at MW-5 shows a trend of increasing concentrations over time.

#### *4.4.5 Compliance Monitor Well MW-10*

Five VOCs (benzene, cis-1,2-dichloroethene, 1,2-dichloropropane, trichloroethene, and vinyl chloride) were detected in the sample collected from monitor well MW-10 above their respective SWSLs during the May 2011 sampling event. In addition, 1,1-dichloroethane was detected in the sample collected from MW-10, but below its respective SWSL. Concentrations of benzene, 1,1-dichloroethane, cis-1,2-dichloroethene, 1,2-dichloropropane, trichloroethene, and vinyl chloride have been detected consistently over time and the 95% UCL for these detections at the facility exceed their respective 2L Standards. Tetrachloroethene was not detected in the sample collected from MW-10 during the May 2011 sampling event. However, tetrachloroethene has been detected sporadically over time and the 95% UCL for these detections at the facility exceed their respective 2L Standards.

Concentrations of barium have been detected consistently over time, and the tolerance level for these detections at the facility does not exceed its respective groundwater standard. Therefore, no trend analysis was performed for barium at monitor well MW-10.

Trend analysis were performed for the following seven VOCs at monitor well MW-10: benzene, 1,1-dichloroethane, cis-1,2-dichloroethene, 1,2-dichloropropane, trichloroethene, tetrachloroethene, and vinyl chloride. A qualitative review of trend graphs shows a trend of decreasing concentrations for tetrachloroethene over time. A qualitative review of the trend graphs for the other six VOCs shows no evident trends of concentrations over time. Time series graphs for wells MW-3R, MW-4R, MW-5 and MW-10 are graphical representations of data trends over time and are included in **Appendix IV**.

## 5.0 CONCLUSIONS & RECOMMENDATIONS

### 5.1 Conclusions

This report summarizes the results of the May 19, 2011 semi-annual ground water and surface water monitoring event at the City of Durham closed MSW landfill. Static water level measurements obtained from on-site monitor wells/piezometers were used to prepare a groundwater potentiometric map (**Figure 3**). Based on the May 2011 groundwater potentiometric contours, and site hydrogeologic characteristics, the average groundwater seepage flow velocity is approximately 9.69 feet/year to the west/northwest beneath the waste management unit.

One (upgradient) background monitor well (MW-9R), five (down-gradient) compliance monitor wells (MW-2, MW-3R, MW-4R, MW-5 and MW-10) and four surface water locations (S-1, S-2, S-3 and S-4) were sampled during the May 2011 sampling event. A groundwater sample was also collected from the new monitor well (MW-11) during the May 2011 sampling event to corroborate the results of the sampling conducted from this well when it was installed in February 2011. The groundwater sample collected from monitor well MW-11 was only analyzed for Appendix I metals.

Benzene, cis-1,2-dichloroethene, 1,2-dichloropropane, trichloroethene and vinyl chloride were detected above their respective 2L Standards in MW-10 during the May 2011 event. Vanadium was detected in monitor wells MW-2 and MW-10 above the 2L Standard with a “J” qualifier. Barium was detected in monitor well MW-5 and MW-11 above the 2L Standard during this event. No statistics were performed for barium at well MW-11 because this well was installed in January 2011 and only two record samples (February 2011 and May 2011) have been collected at this location. No other organic or inorganic constituents were detected in groundwater above their respective 2L or GWP Standards during this event. It is important to note that the laboratory MDL for vinyl chloride is 0.30 µg/L. Although this MDL is less than the SWSL of 1 µg/L, it is greater than the 2L Standard of 0.03 µg/L. Therefore, vinyl chloride may have been present at concentrations above the 2L Standard at concentrations below the MDL.

Seven VOCs (benzene, 1,1-dichloroethane, cis-1,2-dichloroethene, 1,2-dichloropropane, trichloroethene, tetrachloroethene, and vinyl chloride) detected during the May 2011 sampling event were shown to have statistical evidence of a release from the facility, where the 95% UCL was greater than their respective 2L Standards. Trend analyses of these seven VOCs show the following trends:

- Tetrachloroethene shows a trend of decreasing concentrations over time in monitor well MW-10. No trends were evident for benzene, 1,1-dichloroethane, cis-1,2-dichloroethene, 1,2-dichloropropane, trichloroethene, and vinyl chloride over time in monitor well MW-10.

Two inorganic compounds (barium and nickel) detected during the May 2011 sampling event were shown to have statistical evidence of a release from the facility, where the tolerance level, or 95% UCL, was greater than their respective groundwater standards. Trend analyses of barium and nickel show the following trends:

- Barium shows a trend of decreasing concentrations over time in monitor well MW-3R. No trend was evident for nickel concentrations over time in MW-3R. No trend was evident for barium concentrations over time in monitor well MW-4R. Concentrations of barium show a trend of increasing concentration over time in monitor well MW-5.

No constituents were detected in surface water samples above the 2B Surface Water Standards.

Net groundwater flow beneath the landfill is projected toward the west/northwest. Locally, groundwater appears to flow radially away from the closed and capped landfill toward streams nearly surrounding the former disposal area to the northeast, south, and west. Horizontal flow gradients and estimated linear velocities calculated for this monitoring event are consistent with the previous events. Based on the calculated direction of groundwater flow at the facility, the current configuration of the Water Quality Monitoring Network appears to adequately monitor the landfill. However, there appears to be a superfluous number of groundwater monitoring locations distributed in the up-gradient/side-gradient direction (MW-4R, MW-5, MW-7R, MW-8 and MW-9R) compared to the relatively wider distribution of sampling locations in the down-gradient direction (MW-2, MW-3R and MW-10). As previously mentioned, S&ME has requested and was granted permission from NCDENR to temporarily remove monitor wells MW-7R and MW-8 from the semi-annual sampling schedule until the well network is revised and the new Water Quality Monitoring Plan has been submitted and approved by the Section.

A nature and extent study (NES) is currently underway along the western boundary of the landfill in response to constituents detected above 2L Standards in monitor well MW-10. Based on the findings of the NES, modifications to the facility's water quality monitoring plan may be necessary to address the need for additional down-gradient monitoring points.

A compact disk (CD) with an electronic copy of **Table 13** in Excel spreadsheet format (.xls) and an electronic copy of the report in portable document format (.pdf) is included in **Appendix III**.

## 5.2 Recommendations

### Water Quality in the Area of MW-6R/MW-10

The apparent trigger for the facility to begin Assessment Monitoring in December 2005 was the installation of monitor well MW-6R, which replaced monitor well MW-6 in June

2004 (WESTON, September 2004). The location of MW-6R and the detections of chemical constituents at MW-6R not previously detected in MW-6 provided an indication that the well was installed within close proximity to buried waste. Static water levels observed in MW-6R are likely to be influenced by constructed fill and may represent transient water conditions within more permeable waste or disturbed soils rather than the zone of saturation (i.e., rather than groundwater). Water quality observed in MW-6R is likely more indicative of the physical and chemical characteristics of water in the landfill itself rather than that of groundwater. To better evaluate groundwater quality in this area, monitor well MW-10 was installed approximately 60 feet west of MW-6R in the down-gradient direction.

Based on the detection of organic constituents in groundwater exceeding 2L Standards in MW-10, similar to those previously detected in MW-6R, and the close proximity of the well to the landfill waste boundary, S&ME recommends the installation of a replacement well for MW-10. In accordance with Section .1631(a)(2)(a), the relevant point of compliance for the area near MW-10 shall be established no more than 250 feet from a waste boundary, and shall be at least 50 feet within the facility property boundary. The wooded area down gradient from MW-10 offers adequate space to re-locate the compliance monitor well according to those criteria. Piezometer NES-3 is located approximately 80 feet west (down-gradient) of MW-10 in what appears to be appropriate location for a new compliance monitor well. The analytical results from the groundwater sample obtained from NES-3 indicated there is no migration of contamination beyond the compliance boundary. A ditch/intermittent stream lies between the current location of MW-10 and the apparent down-gradient location for the proposed replacement well, and should be considered when establishing a new compliance monitoring location in area of NES-3/MW-10. The results of the NES in the vicinity of MW-10 and proposed location for the replacement monitor well near NES-3 should be submitted to the Section for approval prior to implementation. Assuming the groundwater constituents from a new compliance monitor well near NES-3 are below 2L or GWP Standards, as well as background statistical Upper Limits, the facility may remain under the Detection Monitoring Program. Upon completion of the nature and extent study (NES), the primary focus going forward should be to establish an adequate Water Quality Monitoring Network that will accurately depict groundwater conditions at the facility.

#### **Water quality in the area of MW-5**

Currently, MW-5 is the established compliance monitoring point along the northeast corner of the landfill. If constituents indicating a release from the facility are detected beyond the established compliance point the facility must initiate an assessment monitoring program (.1634) which may subsequently lead to a nature and extent study (NES) – [.1634(g)(1)(A)], an assessment of corrective measures (ACM)-(.1635), and implantation of a corrective action plan (CAP)-(.1637).

Due to the detection of barium above to 2L Standards in monitor well MW-5 and due to the close proximity of MW-5 to the waste boundary, a new monitor well (MW-11) was installed northwest of MW-5 to assess the nature and extent of a possible release from the landfill in accordance with .1634(g)(1)(A) and to possibly establish a new compliance

monitoring point. The new monitor well, MW-11, was installed northwest of MW5. A brief letter report documenting the installation of MW-11 and the results of water quality sampling and analysis from MW-11 is included in **Appendix V**. To corroborate the results of the sampling conducted from this well in February 2011, monitor well MW-11 was included as part of the May 2011 sampling event. Barium was detected in MW-11 above its 2L Standard. However, it should be noted that MW-11 is only about 80 feet from the estimated edge of waste and well within the facility's 250-foot compliance boundary.

According to Section .1632(g)2 of the Solid Waste Rules, a facility may demonstrate that a source other than the landfill caused the contamination. To determine if the detection of barium above 2L Standard in groundwater is due to barium concentrations naturally present in the surrounding soils, S&ME recommends performing an alternate source demonstration (ASD) to evaluate if concentrations of naturally occurring barium within insitu soils at the facility are sufficient to influence the concentration of barium in groundwater samples collected in monitor wells MW-5, MW-10 and MW-11. An ASD report must be prepared by a certified Licensed Geologist and submitted for approval by DWM. The ASD should include collecting undisturbed, native soil in a background location; collecting soil samples in the vicinity of MW-5, MW-10 and MW-11 for laboratory analysis; and evaluating the metals concentrations in soil in accordance with the USEPA's *Soil Screening Guidance: Technical Background Document* (EPA/540/R95/128-May 1996).

If the ASD does not demonstrate that concentrations of naturally occurring barium in soil are sufficient to influence the concentration of barium in groundwater samples, S&ME recommends installing a new monitor well further north of MW-11, closer to the 250-foot compliance boundary. This new monitor well would be located across the creek from the waste disposal area and would be subject to approval by the DWM as a new compliance monitoring well.

S&ME recommends performing the Detection Monitoring for the next sampling event scheduled for November 2011. Although no VOCs were previously detected in piezometer NES-3, if a new replacement well for MW-10 is installed in this area, the results of the groundwater samples collected from the replacement well may determine the need to initiate Assessment Monitoring. As required by the North Carolina Solid Waste Management Rules, Assessment Monitoring as outlined in Title 15A NCAC 13B.1634 would include analysis of the constituents included in Appendix II of 40 CFR Part 258. 40 CFR Part 258 - "Appendix II List of Hazardous Inorganic and Organic Constituents."

## 6.0 REFERENCES

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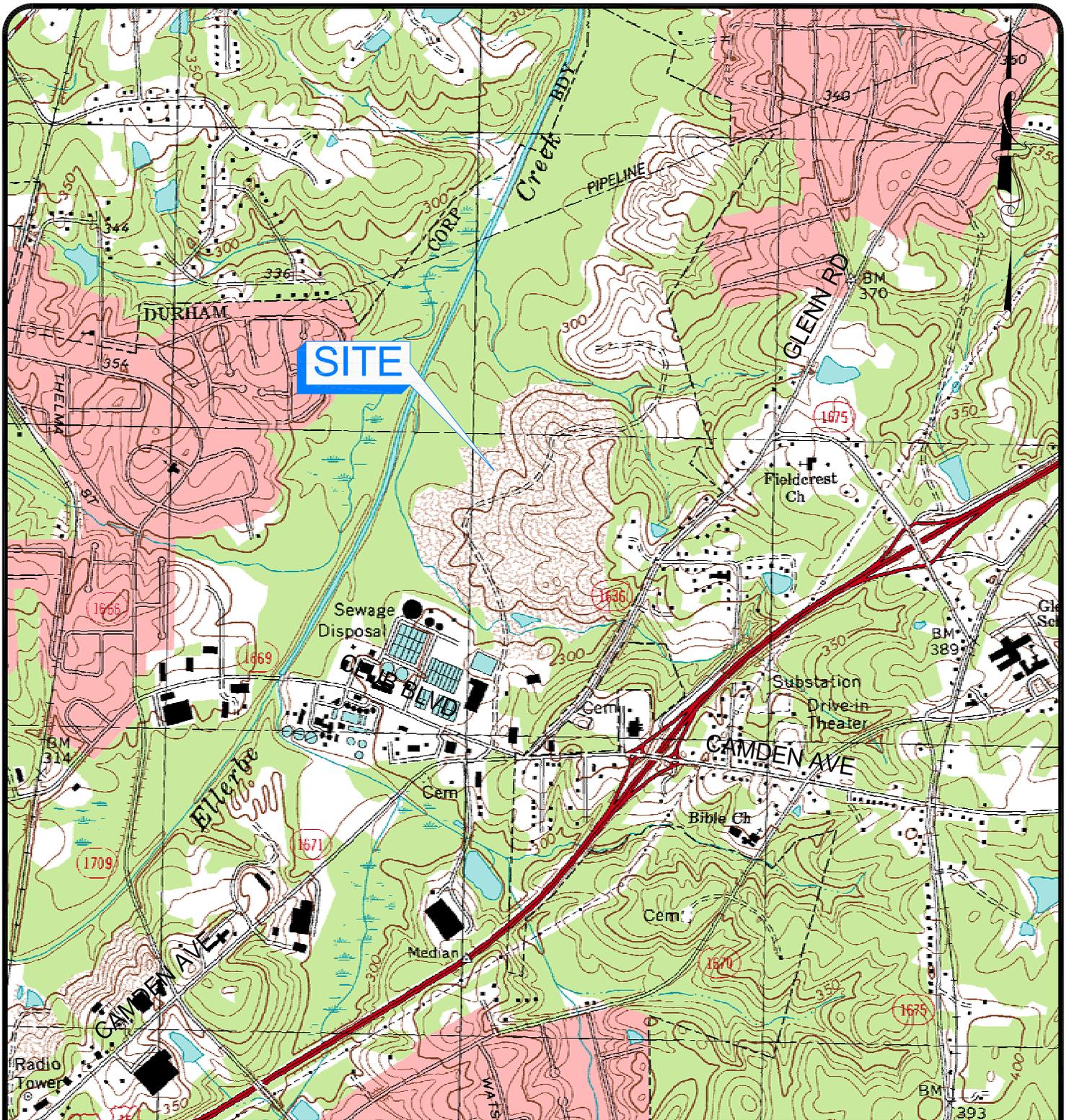
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## **FIGURES**



GRAPHIC SCALE



( IN FEET )

SOURCE: NCGS DRG  
NE DURHAM (O36078A7), DATED 1999

SCALE: 1" = 1500'  
DATE: DEC. 2007  
DRAWN BY: BTR  
PROJECT NO:  
1054-07-469



VICINITY MAP  
CLOSED LANDFILL PERMIT #32-01  
DURHAM, NORTH CAROLINA

A-1051

FIGURE NO.

1

S:\PROJECTS\2007\07-469 City of Durham MSWLF\CAD\A1052.dwg, A1052, 7/30/2008 3:50:09 PM, 1:1



GRAPHIC SCALE



( IN FEET )

IMAGE SOURCE: DURHAM GIS  
REF #s 54130488 & 88865549

A-1052

SCALE:	1" = 500'
DATE:	DEC. 2007
DRAWN BY:	BTR
PROJECT NO:	1054-07-469

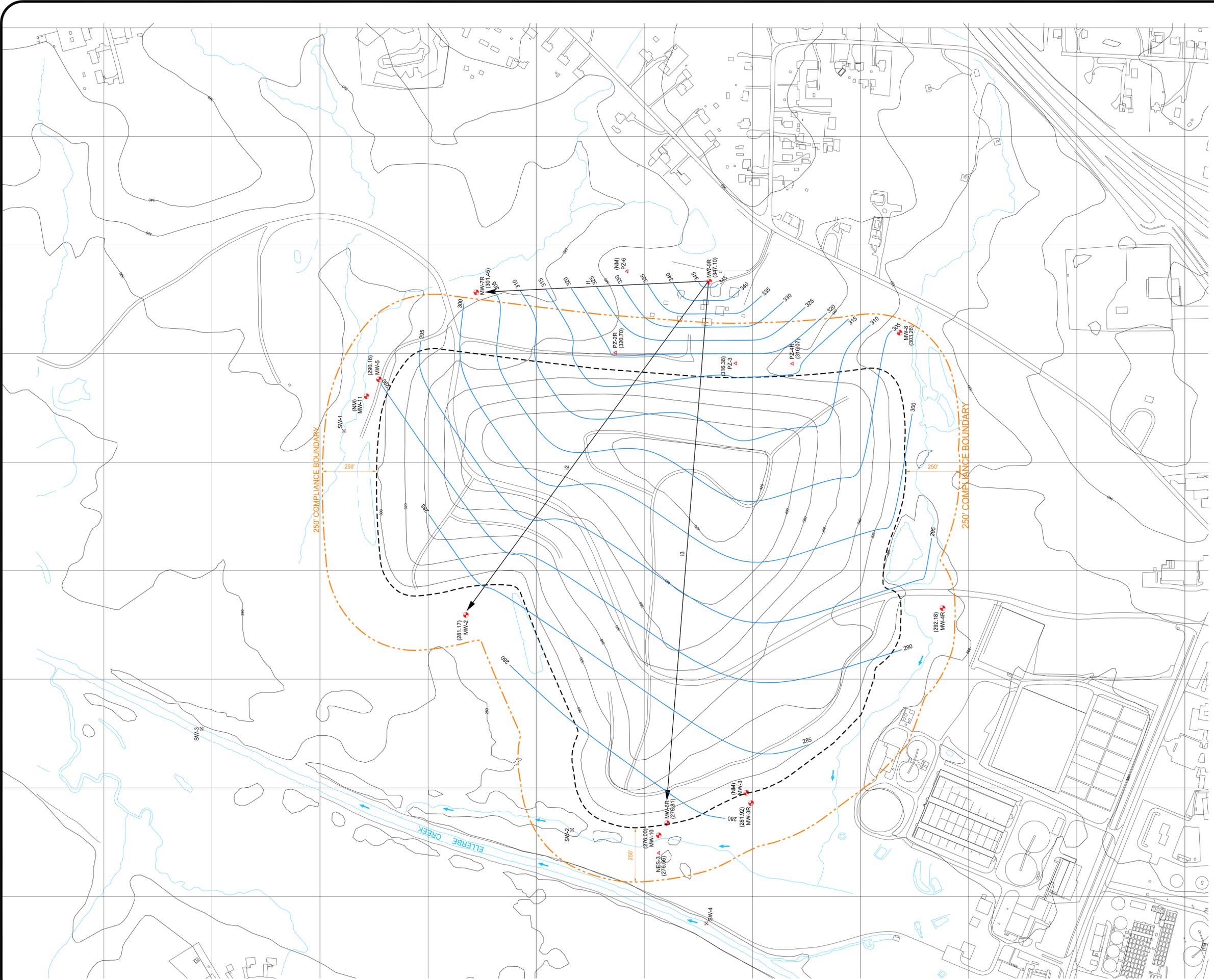


### SITE MAP

CLOSED LANDFILL PERMIT #32-01  
DURHAM, NORTH CAROLINA

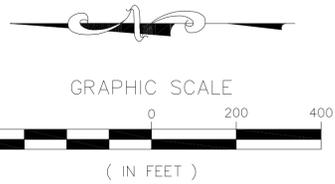
FIGURE NO.

2



- LEGEND**
- MONITOR WELLS
  - PIEZOMETERS
  - SURFACE WATER SAMPLE LOCATIONS
  - GAS COMPLIANCE MONITORING POINTS
  - CONTOUR LINE - MAJOR (20 FT)
  - CONTOUR LINE - MINOR (2 FT)
  - GROUNDWATER ELEVATION (276.08)
  - GROUNDWATER CONTOUR WITH ELEVATION
  - GROUNDWATER FLOW DIRECTION
  - SURFACE WATER FLOW DIRECTION
  - 250' COMPLIANCE BOUNDARY
  - APPROXIMATE LIMIT OF WASTE (NM)
  - NOT MEASURED

- NOTE:**
1. LOCATIONS SURVEYED BY SEPI ENGINEERING ON SEPT 2009.
  2. WELLS MW-1, MW-4, MW-6, MW-7, MW-9, PZ-1, PZ-2 AND PZ-4 HAVE BEEN ABANDONED, DAMAGED OR DESTROYED AND ARE NOT SHOWN ON THIS MAP.
  3. TOPOGRAPHIC CONTOUR INTERVAL = 20 FT.
  4. GROUNDWATER SURFACE CONTOUR INTERVAL = 5 FT.
  5. GROUNDWATER CONTOURS BASED ON LINEAR INTERPOLATION BETWEEN AND EXTRAPOLATION FROM KNOWN DATA, TOPOGRAPHIC CONTOURS, AND KNOWN FIELD CONDITIONS. THEREFORE, GROUNDWATER CONTOURS MAY NOT REFLECT ACTUAL POTENTIOMETRIC CONDITIONS.
  6. GW ELEVATIONS MEASURED ON NOVEMBER 19, 2010.
  7. MW-3 AND MW-11 HAVE NOT BEEN SURVEYED, AND WAS NOT INCLUDED IN CALCULATION OF CONTOUR LINES.
  8. STREAM GAUGES WERE NOT USED FOR THE CREATION OF GROUNDWATER CONTOURS.



SOURCE:  
CONTOURS - NCDOT LIDAR DATED APRIL 2007  
BUILDINGS - DURHAM GIS DATED 1994  
IMAGERY - DURHAM GIS DATED 2005

NO.	DATE	DESCRIPTION	BY

GROUNDWATER POTENTIOMETRIC MAP MAY 19, 2011	
CLOSED LANDFILL PERMIT #32-01 DURHAM, NORTH CAROLINA	
DRAWN BY: BTR	CHECKED BY:
DESIGNED BY:	APPROVED BY:
PROJECT NUMBER: 1054-07-469	DATE: JUNE 2011
SCALE: 1" = 200'	DRAWING NUMBER: D-1235
DRAWING: 3	OF: 3

## **TABLES**

**Table 1**  
**Summary of Historical Static Water Level Data**  
**City of Durham Closed Municipal Solid Waste Landfill**  
**S&ME Project No. 1054-07-469**

Well #	MW-2	MW-3	MW-3R	MW-4R	MW-5	MW-6R	MW-7R	MW-8	MW-9R	MW-10	MW-11	NES-3	PZ-2R <sup>1</sup>	PZ-3	PZ-4R	PZ-6
<b>TOC Elevation (ft AMSL)</b>	285.65	NM	285.19	294.48	298.56	290.51	317.12	311.96	360.58	282.81	NM	283.56	345.90	349.33	338.82	349.21
11/30/2009	279.48	*2.98	281.70	292.34	290.15	278.89	301.66	303.85	346.84	276.07	NM	NM	319.33	317.49	315.67	305.04
5/20/2010	281.47	*2.93	281.76	292.51	290.12	279.20	301.44	304.11	351.95	276.16	NM	NM	321.12	316.76	317.98	306.88
11/19/2010	276.43	*3.55	281.08	292.00	289.31	277.35	300.31	305.37	344.38	275.74	NM	274.74	320.28	317.80	316.40	304.18
5/19/2011	281.17	*2.52	281.92	292.18	290.16	278.81	301.45	303.26	347.10	276.00	*2.06	276.56	320.70	316.38	316.07	NM
<b>MEAN</b>	279.64	-	281.62	292.26	289.94	278.56	301.22	304.15	347.57	275.99	-	275.65	320.36	317.11	316.53	305.37
<b>MAXIMUM</b>	281.47	-	281.92	292.51	290.16	279.20	301.66	305.37	351.95	276.16	-	276.56	321.12	317.80	317.98	306.88
<b>MINIMUM</b>	276.43	-	281.08	292.00	289.31	277.35	300.31	303.26	344.38	275.74	-	274.74	319.33	316.38	315.67	304.18
Well #	MW-2	MW-3	MW-3R	MW-4R	MW-5	MW-6R	MW-7R	MW-8	MW-9R	MW-10	MW-11	NES-3	PZ-2R1	PZ-3	PZ-4R	PZ-6
<b>(OLD) TOC Elevation (ft AMSL)</b>	286.54	285.80	NM	295.63	299.76	291.39	318.21	313.10	361.47	284.00	NM	283.56	346.56	350.03	339.42	350.11
Date																
6/30/2009	279.07	281.50	*5.08	292.11	290.00	278.45	300.40	303.39	347.71	276.86	NI	NI	321.11	317.77	318.08	308.08
11/19/2008	280.36	282.80	*3.64	293.30	291.25	279.42	302.46	304.58	346.98	277.32	NI	NI	319.64	318.31	317.07	306.72
5/19/2008	282.10	NM	*3.43	293.41	291.72	280.04	302.98	304.87	349.36	NI	NI	NI	319.85	317.82	317.18	308.27
11/19/2007	273.92	281.27	NM	292.72	287.60	276.62	298.07	302.37	343.35	NI	NI	NI	319.20	318.91	316.28	304.41
5/30/2007	279.38	281.60	NM	291.00	289.89	278.59	300.48	303.60	348.47	NI	NI	NI	320.18	318.56	319.08	300.51
12/4/2006	279.40	279.90	NM	290.02	288.80	277.18	300.86	301.80	349.22	NI	NI	NI	319.56	319.30	317.42	304.10
6/5/2006	277.45	279.24	NM	291.10	287.45	275.81	298.91	300.51	347.47	NI	NI	NI	319.74	318.85	317.89	304.85
12/5/2005	274.26	279.46	NM	289.94	287.72	275.59	299.17	300.09	346.25	NI	NI	NI	319.65	320.75	317.42	302.60
6/6/2005	280.35	279.12	NM	289.87	287.31	275.79	297.82	300.74	349.62	NI	NI	NI	320.93	321.07	320.42	306.90
12/20/2004	275.48	279.70	NM	289.78	288.18	276.89	299.55	301.72	334.52	NI	NI	NI	318.98	321.02	319.78	307.16
6/28/2004	276.34	279.29	NM	290.00	287.15	275.79	297.73	300.87	349.02	NI	NI	NI	318.70	319.37	313.74	308.83
12/8/2003	278.49	279.69	NI	289.82	288.06	NI	NI	310.00	NI	NI	NI	NI	NI	319.84	NI	305.53
6/9/2003	278.90	280.11	NI	290.04	288.21	NI	NI	301.45	NI	NI	NI	NI	NI	317.81	NI	305.75
12/16/2002	280.13	282.09	NI	290.51	292.22	NI	NI	305.28	NI	NI	NI	NI	NI	318.72	NI	305.12
6/10/2002	275.59	277.77	NI	288.52	288.38	NI	NI	302.55	NI	NI	NI	NI	NI	317.57	NI	304.11
12/4/2001	275.19	278.85	NI	289.15	288.25	NI	NI	299.32	NI	NI	NI	NI	NI	319.11	NI	304.71
6/4/2001	278.37	279.67	NI	289.67	286.67	NI	NI	301.42	NI	NI	NI	NI	NI	318.52	NI	304.90
12/11/2000	277.10	279.50	NI	289.15	288.05	NI	NI	302.01	NI	NI	NI	NI	NI	320.27	NI	303.71
6/6/2000	277.15	279.28	NI	289.37	287.10	NI	NI	301.98	NI	NI	NI	NI	NI	319.45	NI	305.02
12/13/1999	279.09	280.10	NI	289.49	288.28	NI	NI	302.19	NI	NI	NI	NI	NI	319.83	NI	303.64
7/8/1999	NM	NM	NI	289.09	NM	NI	1,390	NM	NI	NI	NI	NI	NI	NM	NI	NM
6/7/1999	275.71	275.30	NI	NI	285.79	NI	NI	300.87	NI	NI	NI	NI	NI	319.05	NI	303.68
12/1/1998	280.06	282.97	NI	NI	298.43	NI	NI	304.40	NI	NI	NI	NI	NI	321.29	NI	304.79
5/26/1998	280.20	283.50	NI	NI	290.20	NI	NI	304.40	NI	NI	NI	NI	NI	318.80	NI	308.10
<b>MEAN</b>	278.29	280.12	-	290.38	288.99	277.29	300.70	302.63	346.54	277.09	-	-	319.78	319.22	317.67	305.28
<b>MAXIMUM</b>	282.10	283.50	-	293.41	298.43	280.04	1390.00	310.00	349.62	277.32	-	-	321.11	321.29	320.42	308.83
<b>MINIMUM</b>	274.26	275.30	-	288.52	285.79	275.59	297.73	299.32	334.52	276.86	-	-	318.70	317.57	313.74	300.51

**Notes:**  
 AMSL = Above Mean Sea Level  
 NA= Not Applicable  
 NM=Not Measured  
 TOC=Top of Well Casing  
 \*= Depth to water measurement taken from top of casing  
 NI=Not Installed  
 Monitor well locations and ground surface and TOC elevations surveyed by SEPI Engineering, September 2009.  
 Unless otherwise noted, static water levels are calculated relative to mean sea level by subtracting the depth-to-water measurement from the TOC elevation.  
 TOC elevations surveyed for all wells except MW-3 were updated in September 2009 by Sepi Engineering.  
 Monitor wells MW-3 and MW-11 have not been surveyed as of this sampling event.

**Table 2**  
**Summary of Estimated Horizontal Flow Velocities**  
**City of Durham Closed Municipal Solid Waste Landfill**  
**S&ME Project No. 1054-07-469**

*May 2011*

Gradient Calculation Segment	Monitoring Wells	Flow Direction	Gradient Segment Length (feet)	Gradient Segment Elevations (feet)	Horizontal Gradient (i, feet)	Effective Porosity (ne)	Hydraulic Conductivity (K, cm/sec)	Velocity (Vgw, feet/year)
i 1	MW-9R to	N	1073	347.1	0.043	0.2	5.85E-05	12.82
	MW-7R			301.45				
i 2	MW-9R to	NW	1900	347.1	0.035	0.2	5.43E-05	9.70
	MW-2			281.17				
i 3	MW-9R to	W	2489	347.1	0.027	0.2	4.65E-05	6.56
	MW-6R			278.81				

**Avg. Hydraulic Gradient = 0.035**

**Avg. Velocity = 9.69**

Notes:

Horizontal velocities based on the modified Darcy equation  $V_{gw} = Ki/ne$ .

Hydraulic conductivity values (K) for MW-2, MW-6R, MW-7R from *May 2008 Monitoring Report* (S&ME, July 2008)

Effective Porosity (n<sub>e</sub>) estimated for residual soils in Carolina Slate Belt

Hydraulic Gradient (i) calculated by measuring linear feet between selected contour intervals

Ave. Linear Velocity (v) =  $(1.035E06)K*i/n$  for units shown

To convert cm/sec to ft/yr, multiply n by 1.035E06

**Table 3**  
**Monitor Well Construction Information**  
**City of Durham Closed Municipal Solid Waste Landfill**  
**S&ME Project No. 1054-07-469**

Well Identification	Northing	Easting	Ground Surface Elevation (ft AMSL)	TOC Elevation (ft AMSL)	Well Depth* (ft BTOC)	Stick-up Casing (ft.)	Well Diameter (inches)	Screened Interval** (ft bgs)
MW-2	831825.39	2042296.22	283.69	285.65	19.62	1.62	2	9.62 - 19.62
MW-3	830528.59	2041476.86	NM	NM	25.33	1.96	2	15.33 - 25.33
MW-3R	830506.19	2041429.44	282.18	285.19	17.65	3.01	2	7.65 - 17.65
MW-4R	829620.37	2042327.33	291.91	294.48	17.39	2.57	2	7.39 - 17.39
MW-5	832227.33	2043381.02	297.16	298.56	21.77	1.40	2	11.77 - 21.77
MW-6R	830894.58	2041337.35	287.62	290.51	26.72	2.89	2	16.72 - 26.72
MW-7R	831776.91	2043781.93	314.60	317.12	44.01	2.52	2	19.01 - 44.01
MW-8	829819.60	2043596.49	308.24	311.96	16.52	3.72	2	9.02 - 16.52
MW-9R	830699.37	2043831.51	358.03	360.58	22.55	2.55	2	12.55 - 22.55
MW-10	830933.30	2041281.28	280.75	282.81	16.61	2.06	2	6.61-16.61
MW-11***	832284.46	2043303.46	NM	292.74	17.72	2.20	2	7.72-17.72
NES-3	830932.76	2041199.90	280.69	283.56	12.35	2.80	2	7.35 - 12.35
PZ-2R	831132.71	2043504.58	343.12	345.90	34.59	2.78	2	24.59 - 34.59
PZ-3	830577.66	2043455.13	345.71	349.33	42.40	3.62	2	27.40 - 42.40
PZ-4R	830315.48	2043453.65	335.85	338.82	38.38	2.97	2	23.38 - 38.38
PZ-6	831079.74	2043879.27	346.79	349.21	61.50	2.42	2	41.50 - 61.50

**Notes:**

ft AMSL = feet above mean sea level

TOC = top of well casing elevation

-- = no data available

bgs = below ground surface

Monitor well locations and ground surface and TOC elevations surveyed by SEPI Engineering, September 2009.

\* Depth to bottom measurements taken on June 13, 2008.

\*\* Screened interval is approximate, based on field measurements by S&ME in May 2008.

\*\*\* Location of MW-11 measured by S&ME using a global positioning system (GPS), January 2011.

TOC and Ground Surface Elevations surveyed for all wells (except MW-3 and MW-11) by SEPI Engineering in September 2009.

**Table 4**  
**Groundwater Quality Summary**  
**City of Durham Closed Municipal Solid Waste Landfill**  
**May 2011 Sampling Event**  
**S&ME Project No. 1054-07-469**

		GROUNDWATER QUALITY SUMMARY											SURFACE WATER QUALITY SUMMARY						
APPENDIX I VOCs EPA METHOD 8260	UNITS	2L Standard	BACKGROUND MONITOR WELL	COMPLIANCE MONITOR WELLS							QUALITY CONTROL		2B Standard	SAMPLING LOCATION				SWSL	
			MW-9R	MW-2	MW-3R	MW-4R	MW-5	MW-10	MW-11	NES-3	Duplicate (MW-10)	Equipment Blank		Upstream (S-4)	Downstream (S-1)	Downstream (S-2)	Downstream (S-3)		
ACETONE	µg/L	6,000	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	NA	NS	<1.2	<1.2	2,000	<1.2	<1.2	<1.2	<1.2	100
BENZENE	µg/L	1	<0.68	<0.68	<0.68	<0.68	<0.68	<b>1.7</b>	NA	NS	<b>1.6</b>	<0.68	1.19	<0.68	<0.68	<0.68	<0.68	<0.68	1
1,4-DICHLOROETHANE	µg/L	6	<0.79	<0.79	<0.79	<0.79	<0.79	<b>0.98 J</b>	NA	NS	<b>1.1</b>	<0.79	4.88	<0.79	<0.79	<0.79	<0.79	<0.79	1
1,1-DICHLOROETHANE	µg/L	6	<0.08	<0.08	<0.08	<0.08	<0.08	<b>3.2 J</b>	NA	NS	<b>3.3 J</b>	<0.08	3,400	<0.08	<0.08	<0.08	<0.08	<0.08	5
CIS-1,2 DICHLOROETHENE	µg/L	70	<0.72	<0.72	<0.72	<0.72	<0.72	<b>110</b>	NA	NS	<b>110</b>	<0.72	340	<0.72	<0.72	<0.72	<0.72	<0.72	5
TRANS-1,2-DICHLOROETHENE	µg/L	100	<0.12	<0.12	<0.12	<0.12	<0.12	<b>4.2 J</b>	NA	NS	<b>4.3 J</b>	<0.12	140	<0.12	<0.12	<0.12	<0.12	<0.12	5
1,2-DICHLOROPROPANE	µg/L	0.6	<0.59	<0.59	<0.59	<0.59	<0.59	<b>2.2</b>	NA	NS	<b>2.1</b>	<0.59	0.52	<0.59	<0.59	<0.59	<0.59	<0.59	1
TRICHLOROETHENE (TCE)	µg/L	3	<0.72	<0.72	<0.72	<0.72	<0.72	<b>12</b>	NA	NS	<b>12</b>	<0.72	NE	<0.72	<0.72	<0.72	<0.72	<0.72	1
VINYL CHLORIDE	µg/L	0.03	<0.60	<0.60	<0.60	<0.60	<0.60	<b>12</b>	NA	NS	<b>11</b>	<0.60	2	<0.60	<0.60	<0.60	<0.60	<0.60	1
APPENDIX I INORGANIC COMPOUNDS EPA METHOD 6010/6020	UNITS	2L Standard	BACKGROUND MONITOR WELL	COMPLIANCE MONITOR WELLS							QUALITY CONTROL		2B Standard	SAMPLING LOCATION				SWSL	
			MW-9R	MW-2	MW-3R	MW-4R	MW-5	MW-10	MW-11	NES-3	Duplicate (MW-10)	Equipment Blank		Upstream (S-4)	Downstream (S-1)	Downstream (S-2)	Downstream (S-3)		
ANTIMONY	µg/L	1*	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	NS	<0.22	<0.22	5.6	<b>0.271 J</b>	<0.22	<0.22	<b>0.292 J</b>	6	
ARSENIC	µg/L	10	<2.8	<2.8	<2.8	<2.8	<2.8	<b>5.23 J</b>	<2.8	NS	<b>6.16 J</b>	<2.8	10	<2.8	<b>5.0 J</b>	<2.8	<2.8	<2.8	10
BARIUM	µg/L	700	<b>53.1 J</b>	<b>83 J</b>	<b>116</b>	<b>562</b>	<b>1,860</b>	<b>248</b>	<b>1120</b>	NS	<b>237</b>	<b>1.14 J</b>	1,000	<b>14.3 J</b>	<b>108</b>	<b>65.2 J</b>	<b>15.5 J</b>	100	
BERYLLIUM	µg/L	4*	<b>0.549 J</b>	<b>0.242 J</b>	<0.1	<0.1	<0.1	<b>0.14 J</b>	<0.1	NS	<b>0.205 J</b>	<0.1	6.5	<0.1	<0.1	<b>0.135 J</b>	<0.1	1	
CHROMIUM	µg/L	10	<b>1.3 J</b>	<b>8.21 J</b>	<b>4.85 J</b>	<b>1.37 J</b>	<b>1.29 J</b>	<b>4.17 J</b>	<b>1.47 J</b>	NS	<b>3.73 J</b>	<1.0	50	<1.0	<b>1.44 J</b>	<b>2.95 J</b>	<1.0	10	
COBALT	µg/L	1*	<b>6.93 J</b>	<1.10	<b>1.70 J</b>	<1.1	<1.1	<b>5.31 J</b>	<b>2.16 J</b>	NS	<b>5.17 J</b>	<1.1	106	<1.1	<b>4.66 J</b>	<b>1.75 J</b>	<b>1.22 J</b>	10	
COPPER	µg/L	1,000	<b>1.99 J</b>	<b>2.62 J</b>	<b>2.50 J</b>	<1.6	<1.6	<b>6.08 J</b>	<1.6	NS	<b>4.9 J</b>	<1.6	7 (AL)	<b>1.6 J</b>	<b>2.11 J</b>	<b>3.75 J</b>	<b>1.93 J</b>	10	
LEAD	µg/L	15	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	NS	<1.9	<1.9	25 (N)	<b>2.31 J</b>	<1.9	<b>2.90 J</b>	<1.9	10	
NICKEL	µg/L	100	<b>3.03 J</b>	<b>2.99 J</b>	<b>6.92 J</b>	<b>3.94 J</b>	<b>3.31 J</b>	<b>6.16 J</b>	<b>1.98 J</b>	NS	<b>5.34 J</b>	<1.8	88 (N)	<b>2.11 J</b>	<b>4.4 J</b>	<b>3.14 J</b>	<b>2.05 J</b>	50	
SELENIUM	µg/L	20	<0.83	<0.83	<b>2.87 J</b>	<b>1.76 J</b>	<b>2.14 J</b>	<b>3.01 J</b>	<b>1.84 J</b>	NS	<b>2.49 J</b>	<0.83	5	<b>1.88 J</b>	<b>1.7 J</b>	<b>1.32 J</b>	<b>1.81 J</b>	10	
VANADIUM	µg/L	0.3*	<1.4	<b>3.86 J</b>	<b>1.47 J</b>	<1.4	<1.4	<b>3.89 J</b>	<1.4	NS	<b>3.89 J</b>	<1.4	NE	<b>2.97 J</b>	<1.4	<b>5.0 J</b>	<b>2.84 J</b>	25	
ZINC	µg/L	1,000	<b>6.26 J</b>	<b>7.80 J</b>	<3.80	<3.8	<3.8	<b>9.03 J</b>	<3.8	NS	<b>9.4 J</b>	<b>4.26 J</b>	50 (AL)	<b>37.1</b>	<b>4.56 J</b>	<b>10.1</b>	<b>36.8</b>	10	

NOTES:

VOCs = Volatile Organic Compounds

2L STANDARD = North Carolina groundwater standards as promulgated by 15A North Carolina Administrative Code, Subchapter 2L (Effective January 1, 2010).

SWSL = Solid Waste Section Limit

\* Indicates there is currently no 2L Standard. The target analyte was compared to the Solid Waste Groundwater Protection (GWP) Standard.

µg/L = Micrograms per liter

Duplicate sample collected from monitor well MW-10.

Values which are **BOLDED** and shaded indicate reported values above their respective NCDENR 2L, GWP or 2B Standards.

Compounds not shown were not detected during this sampling event.

Samples were collected on May 19, 2011 and analyzed by Enco. Detection limits are shown on laboratory reports.

Monitor well MW-11 was sampled to establish background water quality for use as a future compliance monitor well.

NA = Not Analyzed

NE = No Standard Established

(AL) = Action Level Standard

(N) = Narrative Standard

J = Laboratory Qualifier. The reported value is between the laboratory method detection limit (MDL) and the laboratory method reporting limit (MRL), adjusted for actual sample preparation data and moisture content, where applicable.

Table 5  
 Summary of Historically Detected Constituents in Groundwater  
 City of Durham Closed Municipal Solid Waste Landfill  
 S&ME Project No. 1054-07-469  
 Permit No. 32-01

Detected Monitoring Constituents/Analytes	Units	Sample Date	Detection Limit	Quantitation Limit	Solid Waste Section Limits	Background Well MW-9R	MW-2	MW-3R	MW-4R	MW-5	MW-7R	MW-8	MW-10	Equipment Blank	Trip Blank
Ammony - (GPS = 1.0 ug/L) SWD # = 13	ug/L	9/19/1994	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--
	ug/L	2/7/1995	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--
	ug/L	3/13/1995	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--
	ug/L	1/11/1998	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--
	ug/L	6/10/1996	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--
	ug/L	11/12/1996	--	--	5	NM	6	NM	--	ND	--	ND	--	--	--
	ug/L	3/18/1997	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--
	ug/L	10/2/1997	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--
	ug/L	5/26/1998	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--
	ug/L	12/1/1998	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--
	ug/L	6/7/1999	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--
	ug/L	7/8/1999	--	--	5	NM	--	NM	ND	--	--	--	--	--	--
	ug/L	12/15/1999	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	--
	ug/L	6/6/2000	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	--
	ug/L	12/27/2000	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	--
	ug/L	6/4/2001	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	--
	ug/L	12/5/2001	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	--
	ug/L	6/10/2002	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	--
	ug/L	12/16/2002	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	--
	ug/L	6/9/2003	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	--
	ug/L	1/28/2003	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	--
	ug/L	6/29/2004	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	--
	ug/L	12/29/2004	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	--
	ug/L	6/5/2005	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	--
	ug/L	12/5/2005	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	--
	ug/L	6/5/2006	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	--
	ug/L	12/5/2006	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	--
	ug/L	5/30/2007	ND	0.58	2	6	NM	ND	NM	ND	ND	ND	--	ND	--
	ug/L	1/19/2007	0.22	1	6	6	NM	-0.22	NM	-0.22	-0.22	-0.22	--	-0.22	--
	ug/L	5/19/2008	0.22	1	6	6	0.22	-0.22	0.26	-0.22	-0.22	-0.22	--	-0.22	--
	ug/L	11/19/2008	0.29	1	6	6	0.51	0.59 J	0.68 J	0.53 J	0.53 J	0.54 J	0.59 J	0.53 J	--
	ug/L	6/30/2009	0.68	1	6	6	-0.68	-0.68	-0.68	-0.68	-0.68	-0.68	-0.68	-0.68	--
	ug/L	1/18/2009	0.073	2	6	6	-0.073	-0.073	0.066 J	-0.073	-0.073	-0.073	0.066 J	-0.073	--
	ug/L	5/20/2010	0.22	2	6	6	-0.22	-0.22	1.42 J	-0.22	-0.22	-0.22	-0.22	-0.22	--
	ug/L	1/19/2010	0.22	2	6	6	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	--
ug/L	5/19/2011	0.22	2	6	6	-0.22	-0.22	-0.22	-0.22	NS	NS	-0.22	-0.22	--	
Arsenic - (NC 2L = 1.0 ug/L) SWD # = 14	ug/L	9/19/1994	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
	ug/L	12/2/1994	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
	ug/L	2/7/1995	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
	ug/L	3/13/1995	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
	ug/L	1/11/1998	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
	ug/L	6/10/1996	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
	ug/L	11/12/1996	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
	ug/L	3/18/1997	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
	ug/L	10/2/1997	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
	ug/L	5/26/1998	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
	ug/L	12/1/1998	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
	ug/L	6/7/1999	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
	ug/L	7/8/1999	--	--	5	NM	--	NM	5	--	--	ND	--	--	
	ug/L	12/15/1999	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	
	ug/L	6/6/2000	--	--	5	NM	ND	NM	ND	7	--	ND	--	--	
	ug/L	12/27/2000	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	
	ug/L	6/4/2001	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	
	ug/L	12/5/2001	--	--	5	NM	ND	NM	ND	6	--	ND	--	--	
	ug/L	6/10/2002	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	
	ug/L	12/16/2002	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	
	ug/L	6/9/2003	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	
	ug/L	1/28/2003	--	--	5	NM	ND	NM	ND	6	--	ND	--	--	
	ug/L	6/29/2004	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	
	ug/L	12/29/2004	--	--	5	NM	ND	NM	ND	7	--	ND	--	--	
	ug/L	6/5/2005	--	--	5	NM	ND	NM	ND	6	--	ND	--	--	
	ug/L	12/5/2005	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	
	ug/L	6/5/2006	--	--	5	NM	ND	NM	ND	7	--	ND	--	--	
	ug/L	12/5/2006	--	--	5	NM	ND	NM	ND	4	--	ND	--	--	
	ug/L	5/30/2007	2	10	10	10	NM	ND	NM	ND	2.0 JB	2.0 JB	ND	ND	--
	ug/L	1/19/2007	0.15	1	10	10	NM	4.4	NM	0.69	4.4	4.8	4.4	0.89	--
	ug/L	5/19/2008	0.15	1	10	10	-0.15	-0.15	2.7	-0.15	1.9	0.74	-0.15	-0.15	--
	ug/L	1/19/2009	0.22	1	10	10	0.26 J	0.59 J	1.1 J	1.1 J	1.1 J	1.1 J	1.1 J	3.7 J	--
	ug/L	6/30/2009	2.8	1	10	10	-2.8	-2.8	6.2 JB	8.2 JB	4.9 JB	4.4 JB	-2.8	-2.8	--
	ug/L	1/18/2009	2.8	10	10	10	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8	--
	ug/L	5/20/2010	2.8	10	10	10	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8	--
ug/L	1/19/2010	2.8	10	10	10	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8	--	
ug/L	5/19/2011	2.8	10	10	10	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8	--	

Notes:  
 ug/L = micrograms per liter  
 mg/L = milligrams per liter  
 S.U. = Standard Units  
 NTU = Nephelometric Turbidity Units  
 mV = millivolts  
 ND = not detected at the stated reporting limit  
 ORP = Oxidation Reduction Potential  
 µS/cm = micro Siemens per centimeter  
 -- = no data available  
 Blanks = field, trip and method blanks  
 NM = not measured/analyzed  
 NS = not sampled  
 \* Sample data from 9/94 through 12/98 compiled and reported by Malcolm Pirnie, Inc.  
 \* Sample data from 6/99 through 12/06 collected, compiled and reported by Weston Solutions, Inc.  
 \* Sample data from 5/07 collected, compiled and reported by Geiker Associates.  
 \* Sample data from 1/07 thru current was collected, compiled and reported by S&ME.  
 \* Laboratory data prior to November 2007 was not validated by S&ME. Solid Waste Section Limits = NCPQL from 9/14/94 through 12/5/06 and NCSWSL for 5/30/07 and later.  
 Current NCA/C 2L Standards effective January 1, 2010.  
 GPS = Groundwater protection standard

Table 5  
Summary of Historically Detected Constituents in Groundwater  
City of Durham Closed Municipal Solid Waste Landfill  
S&ME Project No. 1054-07-469  
Permit No. 32-01

Detected Monitoring Constituents/Analytes	Units	Sample Date	Detection Limit	Quantitation Limit	Solid Waste Section Limits	Background Well MW-9R	MW-2	MW-3R	MW-4R	MW-5	MW-7R	MW-8	MW-10	Equipment Blank	Trip Blank	
Barium (NC 2L = 700 ug/L) SWD # = 15	ug/L	9/19/1994	--	--	--	NM	199	NM	--	949	--	--	2115	--	--	
	ug/L	12/2/1994	--	--	--	NM	32	NM	--	2300	--	--	119	--	--	
	ug/L	2/7/1995	--	--	--	NM	48	NM	--	2436	--	--	111	--	--	
	ug/L	3/13/1995	--	--	--	NM	37	NM	--	1638	--	--	118	--	--	
	ug/L	1/11/1995	--	--	--	NM	25	NM	--	3360	--	--	120	--	--	
	ug/L	6/10/1996	--	--	--	NM	50	NM	--	992	--	--	123	--	--	
	ug/L	11/21/1996	--	--	--	NM	47	NM	--	976	--	--	84	--	--	
	ug/L	3/18/1997	--	--	--	NM	70	NM	--	1154	--	--	138	--	--	
	ug/L	10/2/1997	--	--	--	NM	48	NM	--	1229	--	--	312	--	--	
	ug/L	5/26/1998	--	--	--	NM	48	NM	--	1637	--	--	193	--	--	
	ug/L	12/1/1998	--	--	--	NM	45	NM	--	867	--	--	118	--	--	
	ug/L	6/7/1999	--	--	--	NM	106	NM	--	996	--	--	373	--	--	
	ug/L	7/8/1999	--	--	--	NM	--	--	--	1217	--	--	--	--	--	
	ug/L	12/13/1999	--	--	--	NM	84	NM	315	942	--	--	116	--	--	
	ug/L	6/6/2000	--	--	--	NM	40	NM	377	2979	--	--	114	--	--	
	ug/L	12/27/2000	--	--	--	NM	144	NM	1120	2757	--	--	184	--	--	
	ug/L	6/4/2001	--	--	--	NM	128	NM	964	3649	--	--	478	--	--	
	ug/L	12/2/2001	--	--	--	NM	153	NM	1853	1441	--	--	778	--	--	
	ug/L	6/10/2002	--	--	--	NM	53	NM	943	1167	--	--	843	--	--	
	ug/L	12/16/2002	--	--	--	NM	89	NM	544	909	--	--	299	--	--	
	ug/L	6/6/2003	--	--	--	NM	67	NM	437	941	--	--	129	--	--	
	ug/L	1/28/2003	--	--	--	NM	85	NM	544	3692	--	--	141	--	--	
	ug/L	6/29/2004	--	--	--	NM	97	NM	251	1899	--	--	763	--	--	
	ug/L	12/29/2004	--	--	--	NM	90	NM	543	4182	--	--	636	--	--	
	ug/L	6/5/2005	--	--	--	NM	64	NM	607	1845	--	--	817	--	--	
	ug/L	1/25/2005	--	--	--	NM	126	NM	585	1758	--	--	793	--	--	
	ug/L	6/5/2006	--	--	--	NM	97	NM	796	2778	--	--	890	--	--	
	ug/L	1/25/2006	--	--	--	NM	63	NM	890	3134	--	--	924	--	--	
	ug/L	5/30/2007	0.2	10	100	NM	67.2 J	NM	472	1240	622	609.0 J	--	--	ND	--
	ug/L	11/19/2007	1	5	100	NM	5	120	510	1400	300	300	--	--	<1	--
	ug/L	5/19/2008	1	100	55	66	530	530	1300	300	600	33	--	--	<1	NM
	ug/L	11/19/2008	1.1	5	100	38 J	83 J	80	310	1400	500	44 J	280	--	<1.1	NM
	ug/L	6/30/2009	4.2	5	100	81.2 J	80.8 J	440	552	1590	618	195	341	--	<4.20	NM
	ug/L	1/1/2010	1	10	100	45.8 J	58 J	80.8 J	513	1450	580	39.4 J	168	--	<1.0	NM
	ug/L	5/20/2010	1	10	100	44.1 J	44.1 J	166	564	1460	578	41.5	122	--	<1.0	NM
	ug/L	11/19/2010	1	10	100	53.3 J	114	102	485	1500	572	56.1 J	238	--	<1.0	NM
	ug/L	5/19/2011	1	10	100	53.1 J	83 J	116	562	1860	NS	NS	248	--	1.14 J	NM
	Benzilms (GPS = 4 ug/L) SWD # = 23	ug/L	9/19/1994	--	--	--	NM	1.5	NM	--	9.8	--	--	7.1	--	--
		ug/L	12/2/1994	--	--	--	NM	1	NM	--	5	--	--	ND	--	--
		ug/L	2/7/1995	--	--	--	NM	ND	NM	--	4	--	--	ND	--	--
		ug/L	3/13/1995	--	--	--	NM	1	NM	--	5.2	--	--	ND	--	--
		ug/L	1/11/1995	--	--	--	NM	ND	NM	--	8	--	--	ND	--	--
		ug/L	6/10/1996	--	--	--	NM	1.5	NM	--	ND	--	--	ND	--	--
		ug/L	11/21/1996	--	--	--	NM	ND	NM	--	ND	--	--	ND	--	--
		ug/L	3/18/1997	--	--	--	NM	ND	NM	--	ND	--	--	ND	--	--
		ug/L	10/2/1997	--	--	--	NM	ND	NM	--	ND	--	--	ND	--	--
		ug/L	5/26/1998	--	--	--	NM	ND	NM	--	ND	--	--	ND	--	--
ug/L		12/1/1998	--	--	--	NM	ND	NM	--	ND	--	--	ND	--	--	
ug/L		6/7/1999	--	--	--	NM	ND	NM	--	ND	--	--	ND	--	--	
ug/L		7/8/1999	--	--	--	NM	ND	NM	--	2	--	--	ND	--	--	
ug/L		12/13/1999	--	--	--	NM	ND	NM	ND	ND	--	--	ND	--	--	
ug/L		6/6/2000	--	--	--	NM	ND	NM	ND	5	--	--	ND	--	--	
ug/L		12/27/2000	--	--	--	NM	ND	NM	ND	8	--	--	ND	--	--	
ug/L		6/4/2001	--	--	--	NM	ND	NM	ND	2	--	--	ND	--	--	
ug/L		12/5/2001	--	--	--	NM	ND	NM	ND	ND	--	--	ND	--	--	
ug/L		6/10/2002	--	--	--	NM	ND	NM	ND	ND	--	--	ND	--	--	
ug/L		12/16/2002	--	--	--	NM	ND	NM	ND	1	--	--	ND	--	--	
ug/L		6/9/2003	--	--	--	NM	ND	NM	ND	ND	--	--	ND	--	--	
ug/L		1/28/2003	--	--	--	NM	ND	NM	ND	2	--	--	ND	--	--	
ug/L		6/29/2004	--	--	--	NM	ND	NM	ND	ND	ND	--	ND	--	--	
ug/L		12/29/2004	--	--	--	NM	ND	NM	ND	2	ND	--	ND	--	--	
ug/L		6/5/2005	--	--	--	NM	ND	NM	ND	ND	ND	--	ND	--	--	
ug/L		1/25/2005	--	--	--	NM	ND	NM	ND	ND	ND	--	ND	--	--	
ug/L		6/5/2006	--	--	--	NM	ND	NM	ND	2	ND	--	ND	--	--	
ug/L		1/25/2006	--	--	--	NM	ND	NM	ND	1	ND	ND	ND	--	--	
ug/L		5/30/2007	0.7	1	100	NM	ND	NM	ND	ND	ND	ND	ND	--	--	
ug/L		11/19/2007	0.24	1	1	NM	-0.24	NM	-0.24	0.93	--	--	0.93	--	-0.24	
ug/L		5/19/2008	0.24	1	1	NM	-0.24	NM	-0.24	0.25	-0.24	3.7	-0.24	-0.24	-0.24	
ug/L		11/19/2008	0.28	1	1	NM	0.73 J	0.73	<1.4	0.34 J	0.3 J	0.37 J	0.3 J	<1.4	<0.28	
ug/L		6/30/2009	0.08	1	1	NM	0.47 J	0.47 J	<0.08	0.13 J	<0.08	0.45 J	0.45 J	<0.08	<0.08	
ug/L		1/1/2010	0.1	1	1	NM	0.534 J	0.182 J	<1.0	<1.0	<1.0	<1.0	0.131 J	<1.0	0.131 J	
ug/L		5/20/2010	0.1	1	1	NM	0.521 J	0.21 J	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
ug/L		11/19/2010	0.1	1	1	NM	0.669 J	0.491 J	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
ug/L		5/19/2011	0.1	1	1	NM	0.549 J	0.242 J	<1.0	<1.0	<1.0	NS	NS	0.14 J	<1.0	

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Cadmium - (NC 2L = 2.0 ug/L) SWD # = 34	ug/L	9/19/1994	--	--	1	NM	ND	NM	--	1.6	ND	ND	--	--	--		
	ug/L	12/2/1994	--	--	1	NM	1	NM	--	ND	ND	ND	--	--	--		
	ug/L	2/7/1995	--	--	1	NM	ND	ND	--	1.6	ND	ND	--	--	--		
	ug/L	3/13/1995	--	--	1	NM	ND	NM	--	ND	ND	ND	--	--	--		
	ug/L	11/1/1995	--	--	1	NM	ND	NM	--	ND	ND	ND	--	--	--		
	ug/L	6/10/1996	--	--	1	NM	1.8	NM	--	ND	ND	ND	--	--	--		
	ug/L	11/12/1996	--	--	1	NM	ND	NM	--	ND	ND	ND	--	--	--		
	ug/L	3/18/1997	--	--	1	NM	ND	NM	--	ND	ND	ND	--	--	--		
	ug/L	10/2/1997	--	--	1	NM	ND	NM	--	ND	ND	ND	--	--	--		
	ug/L	5/26/1998	--	--	1	NM	ND	NM	--	ND	ND	ND	--	--	--		
	ug/L	12/1/1998	--	--	1	NM	ND	NM	--	ND	ND	ND	--	--	--		
	ug/L	6/7/1999	--	--	1	NM	ND	NM	--	3	ND	ND	--	--	--		
	ug/L	7/8/1999	--	--	1	NM	ND	NM	ND	--	ND	ND	--	--	--		
	ug/L	12/15/1999	--	--	1	NM	ND	NM	ND	ND	ND	ND	--	--	--		
	ug/L	6/6/2000	--	--	1	NM	ND	NM	ND	ND	1	ND	--	--	--		
	ug/L	12/27/2000	--	--	1	NM	ND	NM	ND	1	ND	ND	--	--	--		
	ug/L	6/4/2001	--	--	1	NM	ND	NM	ND	ND	ND	ND	--	--	--		
	ug/L	12/5/2001	--	--	1	NM	ND	NM	ND	ND	ND	ND	--	--	--		
	ug/L	6/10/2002	--	--	1	NM	7	NM	ND	2	ND	ND	--	--	--		
	ug/L	12/16/2002	--	--	1	NM	1	NM	ND	1	ND	ND	--	--	--		
	ug/L	6/9/2003	--	--	1	NM	4	NM	ND	ND	ND	ND	--	--	--		
	ug/L	12/8/2003	--	--	1	NM	ND	NM	ND	ND	ND	ND	--	--	--		
	ug/L	6/29/2004	--	--	1	NM	ND	NM	ND	ND	ND	ND	--	--	--		
	ug/L	12/29/2004	--	--	1	NM	ND	NM	ND	ND	ND	ND	--	--	--		
	ug/L	6/5/2005	--	--	1	NM	ND	NM	ND	ND	ND	ND	--	--	--		
	ug/L	12/5/2005	--	--	1	NM	ND	NM	ND	ND	ND	ND	--	--	--		
	ug/L	6/5/2006	--	--	1	NM	ND	NM	ND	ND	ND	ND	--	--	--		
	ug/L	12/5/2006	--	--	1	NM	ND	NM	ND	ND	ND	ND	--	--	--		
	ug/L	5/30/2007	0.5	1	1	NM	ND	NM	ND	ND	ND	ND	--	--	--		
	ug/L	11/19/2007	0.24	0.5	1	NM	-0.24	NM	-0.24	0.34	ND	ND	--	--	--		
	ug/L	5/19/2008	0.24	0.5	1	NM	-0.24	-0.24	-0.24	-0.24	-0.24	-0.24	-0.24	-0.24	-0.24	NM	
	ug/L	11/19/2008	0.15	0.5	1	0.29 J	0.49 J	0.34 J	0.4 J	0.29 J	0.29 J	0.31 J	0.32 J	0.31 J	0.28 J	NM	
	ug/L	6/30/2009	0.09	0.5	1	-0.09	-0.09	-0.12 J	-0.09	-0.09	-0.11 J	-0.09	-0.09	-0.09	-0.09	-0.09	NM
	ug/L	11/30/2009	0.36	1	1	-0.36	-0.36	-0.36	-0.36	-0.36	-0.36	-0.36	-0.36	-0.36	-0.36	-0.36	NM
	ug/L	5/20/2010	0.36	1	1	-0.36	-0.36	-0.36	-0.36	-0.36	-0.36	-0.36	-0.36	-0.36	-0.36	-0.36	NM
	ug/L	11/19/2010	0.36	1	1	-0.36	-0.36	-0.36	-0.36	-0.36	-0.36	-0.36	-0.36	-0.36	-0.36	-0.36	NM
	ug/L	5/19/2011	0.36	1	1	-0.36	-0.36	-0.36	-0.36	-0.36	-0.36	NS	NS	-0.36	-0.36	-0.36	NM
	Chromium - (NC 2L = 10 ug/L) SWD # = 51	ug/L	9/19/1994	--	--	5	NM	28	NM	--	139	ND	699	--	--	--	
		ug/L	12/2/1994	--	--	5	NM	ND	NM	--	ND	ND	ND	--	--	--	
		ug/L	2/7/1995	--	--	5	NM	ND	NM	--	142	ND	97	--	--	--	
ug/L		3/13/1995	--	--	5	NM	ND	NM	--	128	ND	83	--	--	--		
ug/L		11/1/1995	--	--	5	NM	ND	NM	--	36	ND	13	--	--	--		
ug/L		6/10/1996	--	--	5	NM	ND	NM	--	129	ND	6	--	--	--		
ug/L		11/12/1996	--	--	5	NM	ND	NM	--	12	ND	5	--	--	--		
ug/L		3/18/1997	--	--	5	NM	ND	NM	--	19	ND	9	--	--	--		
ug/L		10/2/1997	--	--	5	NM	ND	NM	--	ND	ND	ND	--	--	--		
ug/L		5/26/1998	--	--	5	NM	ND	NM	--	6	ND	ND	--	--	--		
ug/L		12/1/1998	--	--	5	NM	ND	NM	--	ND	ND	11	--	--	--		
ug/L		6/7/1999	--	--	5	NM	ND	NM	--	7	ND	7	--	--	--		
ug/L		7/8/1999	--	--	5	NM	108	NM	--	108	ND	ND	--	--	--		
ug/L		12/15/1999	--	--	5	NM	5	NM	5	5	5	5	--	--	--		
ug/L		6/6/2000	--	--	5	NM	5	NM	5	5	5	5	--	--	--		
ug/L		12/27/2000	--	--	5	NM	7	NM	7	7	7	7	--	--	--		
ug/L		6/4/2001	--	--	5	NM	ND	NM	ND	ND	13	ND	--	--	--		
ug/L		12/5/2001	--	--	5	NM	ND	NM	ND	ND	24	ND	--	--	--		
ug/L		6/10/2002	--	--	5	NM	ND	NM	ND	7	6	ND	--	--	--		
ug/L		12/16/2002	--	--	5	NM	ND	NM	30	ND	17	ND	--	--	--		
ug/L		6/9/2003	--	--	5	NM	2	NM	9	ND	10	ND	--	--	--		
ug/L		12/8/2003	--	--	5	NM	ND	NM	17	ND	10	ND	--	--	--		
ug/L		6/29/2004	--	--	5	NM	13	NM	ND	16	13	12	--	--	--		
ug/L		12/29/2004	--	--	5	NM	4	NM	ND	67	7	ND	--	--	--		
ug/L		6/5/2005	--	--	5	NM	ND	NM	ND	14	ND	ND	--	--	--		
ug/L		12/5/2005	--	--	5	NM	5	NM	5	22	7	ND	--	--	--		
ug/L		6/5/2006	--	--	5	NM	6	NM	41	ND	9	ND	--	--	--		
ug/L		12/5/2006	--	--	5	NM	ND	NM	ND	5	ND	ND	--	--	--		
ug/L		5/30/2007	2	10	10	NM	ND	NM	ND	ND	ND	ND	--	--	--		
ug/L		11/19/2007	2.3	10	10	NM	4.7	NM	2.3	8.8	18	20	--	--	-2.3		
ug/L		5/19/2008	2.3	10	10	-2.3	-2.3	2.4	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3	NM	
ug/L		11/19/2008	2	10	10	-2.0	-2.0	3.0 J	2.5 J	0.7 J	1.3 J	1.2 J	-2.0	2.3 J	6.3 J	-2.0	
ug/L		6/30/2009	0.7	10	10	1.4 J	1.4 J	1.4 J	1.4 J	1.4 J	1.4 J	1.4 J	1.4 J	1.4 J	1.4 J	1.4 J	
ug/L		11/30/2009	1	10	10	-1.0	-1.0	1.4 J	1.4 J	1.4 J	1.4 J	1.4 J	1.4 J	1.4 J	1.4 J	1.4 J	
ug/L		5/20/2010	1	10	10	-1.0	-1.0	1.4 J	1.4 J	1.4 J	1.4 J	1.4 J	1.4 J	1.4 J	1.4 J	1.4 J	
ug/L		11/19/2010	1	10	10	3.65 J	2.27 J	1.47 J	1.47 J	1.47 J	1.47 J	1.47 J	1.47 J	1.47 J	1.47 J	1.47 J	
ug/L		5/19/2011	1	10	10	1.3 J	8.2 J	4.85 J	1.37 J	1.29 J	NS	NS	NS	4.17 J	-1.0		

Notes:  
 ug/L = micrograms per liter  
 mg/L = milligrams per liter  
 S.U. = Standard Units  
 NTU = Nephelometric Turbidity Units  
 mV = millivolts  
 ND = Not detected at the stated reporting limit  
 ORP = Oxidation Reduction Potential  
 µS/cm = micro Siemens per centimeter  
 -- = no data available  
 Blanks = field, trip and method blanks  
 NM = not measured/analyzed  
 NS = not sampled

\* Sample data from 994 through 1298 compiled and reported by Malcolm Pirnie, Inc.  
 \* Sample data from 699 through 1206 collected, compiled and reported by Weston Solutions, Inc.  
 \* Sample data from 507 collected, compiled and reported by Glaser Associates  
 \* Sample data from 1107 thru current was collected, compiled and reported by S&ME  
 \* Laboratory data prior to November 2007 was not validated by S&ME. Solid Waste Section Limits = NCPQL from 9/14/94 through 12/5/06 and NCSWSL for 5/30/07 and later  
 Current NCAAC 2L Standards effective January 1, 2010.  
 GPS = Groundwater protection standard

Table 5  
 Summary of Historically Detected Constituents in Groundwater  
 City of Durham Closed Municipal Solid Waste Landfill  
 S&ME Project No. 1054-07-460  
 Permit No. 32-01

Detected Monitoring Constituents/Analytes	Units	Sample Date	Detection Limit	Quantitation Limit	Solid Waste Section Limits	Background Well MW-9R	MW-2	MW-3R	MW-4R	MW-5	MW-7R	MW-8	MW-10	Equipment Blank	Trip Blank	
Cadmium (GPB = 1.0 ug/L) SWD # = 53	ug/L	9/19/1994	--	--	--	NM	ND	NM	--	89	--	22	--	--	--	
	ug/L	12/21/1994	--	--	--	NM	ND	NM	--	39	--	ND	--	--	--	
	ug/L	2/7/1995	--	--	--	NM	ND	NM	--	23	--	ND	--	--	--	
	ug/L	3/13/1995	--	--	--	NM	ND	NM	--	18	--	ND	--	--	--	
	ug/L	11/11/1995	--	--	10	NM	ND	NM	--	47	--	ND	--	--	--	
	ug/L	6/10/1996	--	--	10	NM	ND	NM	--	ND	--	12	--	--	--	
	ug/L	11/12/1996	--	--	10	NM	ND	NM	--	ND	--	13	--	--	--	
	ug/L	3/18/1997	--	--	10	NM	ND	NM	--	ND	--	16	--	--	--	
	ug/L	10/2/1997	--	--	10	NM	ND	NM	--	ND	--	21.5	--	--	--	
	ug/L	5/26/1998	--	--	10	NM	ND	NM	--	ND	--	15	--	--	--	
	ug/L	12/1/1998	--	--	5	NM	ND	NM	--	ND	--	14	--	--	--	
	ug/L	6/7/1999	--	--	5	NM	ND	NM	--	ND	--	14	--	--	--	
	ug/L	7/8/1999	--	--	10	NM	ND	NM	--	29	--	--	--	--	--	
	ug/L	12/14/1999	--	--	10	NM	ND	NM	--	ND	--	14	--	--	--	
	ug/L	6/6/2000	--	--	10	NM	ND	NM	--	ND	--	14	--	--	--	
	ug/L	12/27/2000	--	--	10	NM	ND	NM	ND	150	--	19	--	--	--	
	ug/L	6/4/2001	--	--	10	NM	ND	NM	ND	60	--	13	--	--	--	
	ug/L	12/3/2001	--	--	10	NM	ND	NM	ND	11	--	17	--	--	--	
	ug/L	6/10/2002	--	--	10	NM	ND	NM	ND	14	--	20	--	--	--	
	ug/L	12/16/2002	--	--	10	NM	ND	NM	ND	11	--	25	--	--	--	
	ug/L	6/9/2003	--	--	10	NM	ND	NM	ND	ND	--	16	--	--	--	
	ug/L	12/8/2003	--	--	10	NM	ND	NM	ND	65	--	16	--	--	--	
	ug/L	6/29/2004	--	--	5	NM	ND	NM	ND	ND	--	26	--	--	--	
	ug/L	12/29/2004	--	--	5	NM	ND	NM	ND	47	--	20	--	--	--	
	ug/L	6/5/2005	--	--	5	NM	ND	NM	--	--	--	--	--	--	--	
	ug/L	12/5/2005	--	--	5	NM	ND	NM	--	--	--	--	--	--	--	
	ug/L	6/5/2006	--	--	5	NM	ND	NM	--	--	--	--	--	--	--	
	ug/L	12/5/2006	--	--	5	NM	ND	NM	--	--	--	--	--	--	--	
	ug/L	5/30/2007	2	10	10	NM	ND	NM	ND	ND	11.3	--	--	ND	--	
	ug/L	11/19/2007	1.1	10	10	NM	2.3	NM	2	2.5	7	--	--	--	<1.1	
	ug/L	5/19/2008	<1.1	10	10	4.1	7.3	NM	<1.1	<1.1	<1.1	2.6	--	--	<1.1	
	ug/L	11/19/2008	1.1	10	10	5	4.7 J	<1.1	4.7 J	<1.1	<1.1	7.8 J	16	--	<1.1	
	ug/L	6/30/2009	0.6	10	10	5.9 J	6.7 J	6.7 J	6.7 J	6.7 J	6.7 J	5.7 J	21.7	--	<0.6	
	ug/L	11/19/2009	1.1	10	10	5.43 J	1.95 J	1.95 J	<1.10	<1.10	<1.10	4.28 J	8.89 J	<1.10	NM	
	ug/L	5/20/2010	1.1	10	10	5.75 J	4.42 J	4.42 J	<1.10	<1.10	<1.10	6.01 J	3.89 J	<1.10	NM	
	ug/L	11/19/2010	1.1	10	10	6.12 J	2.5 J	2.5 J	<1.10	<1.10	<1.10	4.41 J	8.05 J	<1.10	NM	
	ug/L	5/19/2011	1.1	10	10	6.09 J	<1.10	1.7 J	<1.10	<1.10	<1.10	NS	5.11 J	<1.10	NM	
	Copper (NC 2L = 1000 ug/L) SWD # = 54	ug/L	9/19/1994	--	--	5	NM	ND	NM	--	896	--	73	--	--	--
		ug/L	12/21/1994	--	--	5	NM	ND	NM	--	113	--	7.3	--	--	--
		ug/L	2/7/1995	--	--	5	NM	ND	NM	--	75	--	5.2	--	--	--
		ug/L	3/13/1995	--	--	5	NM	ND	NM	--	28	--	6.8	--	--	--
		ug/L	11/11/1995	--	--	5	NM	ND	NM	--	145	--	ND	--	--	--
		ug/L	6/10/1996	--	--	5	NM	ND	NM	--	5	--	8.7	--	--	--
ug/L		11/12/1996	--	--	5	NM	ND	NM	--	10	--	10	--	--	--	
ug/L		3/18/1997	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		10/2/1997	--	--	5	NM	ND	NM	--	ND	--	5	--	--	--	
ug/L		5/26/1998	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		12/1/1998	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		6/7/1999	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		7/8/1999	--	--	5	NM	ND	NM	--	89	--	ND	--	--	--	
ug/L		12/13/1999	--	--	5	NM	2	NM	5	6	--	5	--	--	--	
ug/L		6/6/2000	--	--	5	NM	5	NM	5	5	--	5	--	--	--	
ug/L		12/27/2000	--	--	5	NM	5	NM	5	34	--	ND	--	--	--	
ug/L		6/4/2001	--	--	5	NM	ND	NM	ND	28	--	ND	--	--	--	
ug/L		12/3/2001	--	--	5	NM	ND	NM	ND	15	--	ND	--	--	--	
ug/L		6/10/2002	--	--	5	NM	ND	NM	ND	7	--	20	--	--	--	
ug/L		12/16/2002	--	--	5	NM	ND	NM	ND	20	--	16	--	--	--	
ug/L		6/9/2003	--	--	5	NM	ND	NM	ND	8	--	14	--	--	--	
ug/L		12/8/2003	--	--	5	NM	ND	NM	ND	6	--	26	--	--	--	
ug/L		6/29/2004	--	--	5	NM	5	NM	ND	--	--	12	--	--	--	
ug/L		12/29/2004	--	--	5	NM	ND	NM	ND	6	--	5	--	--	--	
ug/L		6/5/2005	--	--	2	NM	2	NM	2	11	--	ND	--	--	--	
ug/L		12/5/2005	--	--	2	NM	4	NM	4	--	--	ND	--	--	--	
ug/L		6/5/2006	--	--	2	NM	3	NM	3	--	--	7	--	--	--	
ug/L		12/5/2006	--	--	2	NM	ND	NM	ND	2	--	ND	--	--	--	
ug/L		5/30/2007	0.6	10	10	NM	1.1 B	NM	1.7 B	ND	0.6 B	ND	--	ND	--	
ug/L		11/19/2007	0.45	10	10	NM	2.1	NM	1.1	4	7.2	17	--	1.1	--	
ug/L		5/19/2008	0.45	10	10	2.3	1.8	7.3	4.6	1.7	1.3	1.8	--	5.7	NM	
ug/L		11/19/2008	0.48	10	10	1.2 J	3.4 J	1.5 J	1.3 J	1.2 J	2.6 J	3.7 J	--	1.1 J	NM	
ug/L		6/30/2009	0.81	10	10	1.14 J	<0.81	<0.81	<0.81	<0.81	<0.81	1.33 J	2.36 J	--	NM	
ug/L		11/19/2009	1.6	10	10	<1.60	<1.60	<1.60	<1.60	<1.60	<1.60	<1.60	<1.60	<1.60	NM	
ug/L		5/20/2010	1.6	10	10	<1.60	<1.60	<1.60	<1.60	<1.60	<1.60	<1.60	<1.60	<1.60	NM	
ug/L		11/19/2010	1.6	10	10	<1.60	<1.60	<1.60	<1.60	<1.60	<1.60	<1.60	<1.60	<1.60	NM	
ug/L		5/19/2011	1.6	10	10	1.99 J	2.62 J	2.50 J	<1.60	<1.60	NS	NS	6.08 J	<1.60	NM	

Notes:  
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 mg/L = milligrams per liter  
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 NTU = Nephelometric Turbidity Units  
 mV = millivolts  
 ND = Not detected at the stated reporting limit  
 ORP = Oxidation Reduction Potential  
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 Blanks = field, trip and method blanks  
 NM = not measured/analyzed  
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 \* Sample data from 994 through 1298 compiled and reported by Malcolm Pirnie, Inc.  
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 \* Sample data from 1107 data current was collected, compiled and reported by S&ME.  
 \* Laboratory data prior to November 2007 was not validated by S&ME. Solid Waste Section Limits = NCPQL from 9/14/94 through 12/5/06 and NCSWSL for 5/30/07 and later  
 Current NCAC 2L Standards effective January 1, 2010.  
 GPB = Groundwater protection standard

Table 5  
 Summary of Historically Detected Constituents in Groundwater  
 City of Durham Closed Municipal Solid Waste Landfill  
 S&ME Project No. 1054-07-469  
 Permit No. 32-01

Detected Monitoring Constituent/Analytes	Units	Sample Date	Detection Limit	Quantitation Limit	Solid Waste Section Limits	Background Well MW-9R	MW-2	MW-3R	MW-4R	MW-5	MW-7R	MW-8	MW-10	Equipment Blank	Trip Blank
Lead - (NC 2L = 15 ug/L) SWD # = 131	ug/L	9/19/1994	--	--	5	NM	ND	NM	--	199	--	47	--	--	--
	ug/L	12/2/1994	--	--	5	NM	14	NM	--	77	--	10	--	--	--
	ug/L	1/27/1995	--	--	5	NM	7.8	NM	--	65	--	12	--	--	--
	ug/L	3/13/1995	--	--	5	NM	ND	NM	--	35	--	63	--	--	--
	ug/L	11/1/1995	--	--	5	NM	ND	NM	--	60	--	ND	--	--	--
	ug/L	6/10/1996	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--
	ug/L	11/2/1996	--	--	5	NM	ND	NM	--	8	--	ND	--	--	--
	ug/L	3/18/1997	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--
	ug/L	10/2/1997	--	--	5	NM	ND	NM	--	14	--	7	--	--	--
	ug/L	5/26/1998	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--
	ug/L	12/1/1998	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--
	ug/L	6/7/1999	--	--	5	NM	ND	NM	--	8	--	ND	--	--	--
	ug/L	7/8/1999	--	--	5	NM	ND	NM	--	29	--	5	--	--	--
	ug/L	12/15/1999	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	--
	ug/L	6/6/2000	--	--	5	NM	ND	NM	ND	16	--	ND	--	--	--
	ug/L	12/27/2000	--	--	5	NM	10	NM	ND	82	--	ND	--	--	--
	ug/L	6/4/2001	--	--	5	NM	8	NM	ND	68	--	ND	--	--	--
	ug/L	12/3/2001	--	--	5	NM	ND	NM	ND	23	--	ND	--	--	--
	ug/L	6/10/2002	--	--	5	NM	ND	NM	ND	7	--	ND	--	--	--
	ug/L	12/16/2002	--	--	5	NM	5	NM	8	12	--	12	--	--	--
	ug/L	6/9/2003	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	--
	ug/L	12/8/2003	--	--	5	NM	ND	NM	ND	47	--	ND	--	--	--
	ug/L	6/29/2004	--	--	5	NM	ND	NM	ND	11	--	6	--	--	--
	ug/L	12/20/2004	--	--	5	NM	ND	NM	ND	75	--	ND	--	--	--
	ug/L	6/5/2005	--	--	5	NM	ND	NM	ND	39	--	ND	--	--	--
	ug/L	12/5/2005	--	--	5	NM	ND	NM	ND	13	--	ND	--	--	--
	ug/L	6/5/2006	--	--	5	NM	ND	NM	ND	38	--	ND	--	--	--
	ug/L	12/5/2006	--	--	5	NM	ND	NM	ND	12	--	ND	--	--	--
	ug/L	5/30/2007	2	--	10	10	NM	ND	ND	ND	--	ND	--	--	3.1 J
	ug/L	11/19/2007	2.4	--	10	10	NM	5	3.1	8.1	--	17	--	--	3.5
	ug/L	5/19/2008	2.4	--	5	5	<2.4	<2.4	<2.4	<2.4	--	<2.4	--	--	<2.4
	ug/L	11/19/2008	0.13	--	1	10	3.2 J	0.5 J	1.3 J	0.19 J	--	4.7 J	--	--	3.1 J
	ug/L	6/30/2009	1.6	--	10	10	<1.6	<1.6	<1.6	3.6 JB	--	2.1 JB	--	--	8.8 JB
	ug/L	1/30/2009	1.9	--	10	10	<1.9	<1.9	<1.9	2.22 J	--	<1.9	--	--	3.09 J
	ug/L	5/20/2010	1.9	--	10	10	<1.9	<1.9	<1.9	<1.9	--	<1.9	--	--	2.64 J
ug/L	11/19/2010	1.9	--	10	10	<1.9	<1.9	<1.9	2.62 J	--	<1.9	--	--	<1.9	
ug/L	5/19/2011	1.9	--	10	10	<1.9	<1.9	<1.9	NS	--	NS	--	--	<1.9	
Mercury - (NC 2L = 1.0 ug/L) SWD # = 132	ug/L	12/1/1998	--	--	0.2	NM	ND	NM	--	ND	--	ND	--	--	
	ug/L	6/7/1999	--	--	0.2	NM	ND	NM	--	ND	--	ND	--	--	
	ug/L	7/8/1999	--	--	0.2	NM	--	NM	ND	--	--	--	--	--	
	ug/L	12/15/1999	--	--	5	NM	ND	NM	ND	--	ND	--	--	--	
	ug/L	6/6/2000	--	--	5	NM	ND	NM	28	--	16	--	--	--	
	ug/L	12/23/2000	--	--	10	NM	ND	NM	ND	--	83	--	--	--	
	ug/L	6/4/2001	--	--	5	NM	8	NM	ND	--	68	--	--	--	
	ug/L	12/3/2001	--	--	5	NM	ND	NM	ND	--	23	--	--	--	
	ug/L	6/10/2002	--	--	5	NM	ND	NM	7	--	ND	--	--	--	
	ug/L	12/16/2002	--	--	5	NM	3	NM	8	--	ND	--	--	--	
	ug/L	6/5/2003	--	--	5	NM	ND	NM	ND	--	5	--	--	--	
	ug/L	12/8/2003	--	--	5	NM	ND	NM	47	--	ND	--	--	--	
	ug/L	6/29/2004	--	--	5	NM	ND	NM	28	--	11	--	--	--	
	ug/L	12/20/2004	--	--	5	NM	ND	NM	ND	--	75	--	--	--	
	ug/L	6/5/2005	--	--	5	NM	ND	NM	ND	--	39	--	--	--	
	ug/L	12/7/2005	--	--	5	NM	ND	NM	ND	--	13	--	--	--	
	ug/L	6/5/2006	--	--	5	NM	ND	NM	ND	--	38	--	--	--	
	ug/L	12/5/2006	--	--	5	NM	ND	NM	ND	--	12	--	--	--	
	ug/L	5/30/2007	0.11	--	0.2	0.2	NM	ND	NM	ND	--	ND	--	--	ND
	ug/L	11/19/2007	0.044	--	0.2	0.2	NM	<0.044	NM	<0.044	--	<0.044	--	--	<0.044
	ug/L	5/19/2008	0.044	--	0.2	0.2	<0.044	<0.044	<0.044	<0.044	--	<0.044	--	--	<0.044
	ug/L	11/19/2008	0.044	--	0.2	0.2	<0.044	<0.044	0.11 J	<0.044	--	<0.044	--	--	<0.044
	ug/L	6/30/2009	0.044	--	0.2	0.2	NM	NM	NM	NM	--	NM	--	--	NM
	ug/L	1/30/2009	0.044	--	0.2	0.2	NM	NM	NM	NM	--	NM	--	--	NM
	ug/L	5/20/2010	0.044	--	0.2	0.2	NM	NM	NM	NM	--	NM	--	--	NM
	ug/L	11/19/2010	0.044	--	0.2	0.2	NM	NM	NM	NM	--	NM	--	--	NM
	ug/L	5/19/2011	0.044	--	0.2	0.2	NM	NM	NM	NM	--	NS	--	--	NM

Notes:  
 ug/L = micrograms per liter  
 mg/L = milligrams per liter  
 S.U. = Standard Units  
 NTU = Nephelometric Turbidity Units  
 mV = millivolts  
 ND = Not detected at the stated reporting limit  
 ORP = Oxidation Reduction Potential  
 µS/cm = micro Siemens per centimeter  
 -- = no data available  
 Blanks = field, trip and method blanks  
 NM = not measured/analyzed  
 NS = not sampled  
 \* Sample data from 9/94 through 12/98 compiled and reported by Malcolm Pirnie, Inc.  
 \* Sample data from 6/99 through 12/06 collected, compiled and reported by Weston Solutions, Inc.  
 \* Sample data from 5/07 collected, compiled and reported by Golder Associates.  
 \* Sample data from 1/07 thru current was collected, compiled and reported by S&ME.  
 \* Laboratory data prior to November 2007 was not validated by S&ME. Solid Waste Section Limits = NCPQL from 9/14/94 through 12/5/06 and NCSWSL for 5/30/07 and later  
 Current NCA/C 2L Standards effective January 1, 2010.  
 GPS = Groundwater protection standard

Table 5  
 Summary of Historically Detected Constituents in Groundwater  
 City of Durham Closed Municipal Solid Waste Landfill  
 S&ME Project No. 1054-07-469  
 Permit No. 32-01

Detected Monitoring Constituents/Analytes	Units	Sample Date	Detection Limit	Quantitation Limit	Solid Waste Section Limits	Background Well MW-9R	MW-2	MW-3R	MW-4R	MW-5	MW-7R	MW-8	MW-10	Equipment Blank	Trip Blank
Nickel - (NC 2L = 100 ug/L) SWID # = 152	ug/L	9/19/1994	--	--	10	NM	15	NM	--	468	--	77	--	--	--
	ug/L	12/2/1994	--	--	10	NM	ND	NM	--	96	--	14	--	--	--
	ug/L	2/7/1995	--	--	10	NM	ND	NM	--	64	--	ND	--	--	--
	ug/L	3/13/1995	--	--	10	NM	ND	NM	--	61	--	11	--	--	--
	ug/L	11/1/1995	--	--	10	NM	ND	NM	--	68	--	ND	--	--	--
	ug/L	6/10/1996	--	--	10	NM	ND	NM	--	ND	--	ND	--	--	--
	ug/L	11/12/1996	--	--	10	NM	ND	NM	--	12	--	ND	--	--	--
	ug/L	3/18/1997	--	--	10	NM	ND	NM	--	ND	--	ND	--	--	--
	ug/L	10/2/1997	--	--	10	NM	ND	NM	--	ND	--	ND	--	--	--
	ug/L	5/26/1998	--	--	10	NM	ND	NM	--	ND	--	ND	--	--	--
	ug/L	12/1/1998	--	--	10	NM	ND	NM	--	ND	--	ND	--	--	--
	ug/L	6/7/1999	--	--	10	NM	ND	NM	--	16	--	ND	--	--	--
	ug/L	7/8/1999	--	--	10	NM	ND	NM	--	37	--	ND	--	--	--
	ug/L	12/15/1999	--	--	10	NM	10	NM	--	ND	--	ND	--	--	--
	ug/L	6/6/2000	--	--	10	NM	ND	NM	--	13	--	ND	--	--	--
	ug/L	12/27/2000	--	--	10	NM	ND	NM	--	132	--	ND	--	--	--
	ug/L	6/4/2001	--	--	10	NM	ND	NM	--	11	--	20	--	--	--
	ug/L	12/3/2001	--	--	10	NM	ND	NM	--	19	--	ND	--	--	--
	ug/L	6/10/2002	--	--	10	NM	ND	NM	--	ND	--	ND	--	--	--
	ug/L	12/16/2002	--	--	10	NM	ND	NM	--	ND	--	14	--	--	--
	ug/L	6/9/2003	--	--	10	NM	ND	NM	--	ND	--	11	--	--	--
	ug/L	12/8/2003	--	--	10	NM	ND	NM	--	29	--	ND	--	--	--
	ug/L	6/29/2004	--	--	10	NM	12	NM	--	14	--	10	--	--	--
	ug/L	12/20/2004	--	--	10	NM	ND	NM	--	10	--	ND	--	--	--
	ug/L	6/5/2005	--	--	10	NM	ND	NM	--	13	--	11	--	--	--
	ug/L	12/5/2005	--	--	10	NM	10	NM	--	15	--	ND	--	--	--
	ug/L	6/5/2006	--	--	10	NM	ND	NM	--	33	--	ND	--	--	--
	ug/L	12/5/2006	--	--	10	NM	ND	NM	--	ND	--	ND	--	--	--
	ug/L	5/30/2007	2	10	10	NM	ND	2.6 J	4.4 J	2.8 J	ND	24.7 J	ND	ND	ND
	ug/L	11/19/2007	9.8	20	20	NM	9.9	9.8	11	11	19	19	19	19	19
	ug/L	5/19/2008	9.8	20	20	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8
	ug/L	11/19/2008	9.8	20	20	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8
	ug/L	6/30/2009	0.6	20	20	3.4 JB	3.4 JB	5.7 JB	5.0 JB	5.7 JB	2.1 JB	7.6 JB	13.1 JB	6.6 JB	6.6 JB
	ug/L	11/30/2009	1.8	10	10	2.17 J	1.80	5.81 J	2.29 J	1.80	1.80	4.28 J	1.80	4.28 J	1.80
	ug/L	5/20/2010	1.8	10	10	2.44 J	1.80	6.78 J	3.20 J	1.80	1.80	1.98 J	1.80	1.80	1.80
	ug/L	11/19/2010	1.8	10	10	4.33 J	3.13 J	5.84 J	2.7 J	1.80	1.80	6.23 J	1.80	6.23 J	1.80
	ug/L	5/19/2011	1.8	10	10	3.03 J	2.99 J	6.92 J	3.31 J	NS	NS	6.16 J	1.80	6.16 J	1.80
	Selenium - (NC 2L = 50 ug/L) SWID # = 183	ug/L	9/19/1994	--	--	5	NM	ND	NM	--	ND	--	ND	--	--
		ug/L	12/2/1994	--	--	5	NM	7.6	NM	--	ND	--	ND	--	--
		ug/L	2/7/1995	--	--	5	NM	ND	NM	--	ND	--	ND	--	--
ug/L		3/13/1995	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
ug/L		11/1/1995	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
ug/L		6/10/1996	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
ug/L		11/12/1996	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
ug/L		3/18/1997	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
ug/L		10/2/1997	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
ug/L		5/26/1998	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
ug/L		12/1/1998	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
ug/L		6/7/1999	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
ug/L		7/8/1999	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
ug/L		12/15/1999	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
ug/L		6/6/2000	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
ug/L		12/27/2000	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
ug/L		6/4/2001	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
ug/L		12/3/2001	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
ug/L		6/10/2002	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
ug/L		12/16/2002	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
ug/L		6/9/2003	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
ug/L		12/8/2003	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
ug/L		6/29/2004	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
ug/L		12/20/2004	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
ug/L		6/5/2005	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
ug/L		12/5/2005	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
ug/L		6/5/2006	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
ug/L		12/5/2006	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	
ug/L		5/30/2007	2	10	10	NM	ND	NM	ND	ND	3.2 B	ND	ND	ND	
ug/L		11/19/2007	0.43	1	10	0.51	0.51	1.8	1.8	1.8	1.8	1.8	1.8	1.8	
ug/L		5/19/2008	0.43	1	10	0.43	0.43	0.47	0.47	0.43	0.43	0.43	0.43	0.43	
ug/L		11/19/2008	0.32	1	10	0.55 J	0.32	1.5 J	0.42 J	0.32	0.67 J	1.5 J	0.36 J	0.36 J	
ug/L		6/30/2009	3.4	10	10	3.6 JB	3.4 JB	5.7 JB	5.0 JB	5.7 JB	2.1 JB	7.6 JB	13.1 JB	6.6 JB	
ug/L		11/30/2009	2.7	10	10	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	
ug/L		5/20/2010	0.83	10	10	0.83	0.83	1.2 J	1.42 J	0.83	0.83	0.83	0.83	0.83	
ug/L		11/19/2010	0.83	10	10	0.83	0.83	2.41 J	0.928 J	1.42 J	0.83	0.863 J	2.11 J	0.83	
ug/L		5/19/2011	0.83	10	10	0.83	0.83	2.87 J	1.76 J	2.44 J	NS	3.01 J	0.83	3.01 J	

Notes:  
 ug/L = micrograms per liter  
 mg/L = milligrams per liter  
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 NTU = Nephelometric Turbidity Units  
 mV = millivolts  
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 ORP = Oxidation Reduction Potential  
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 Blanks = field, trip and method blanks  
 NM = not measured/analyzed  
 NS = not sampled  
 \* Sample data from 9/94 through 12/98 compiled and reported by Malcolm Pirnie, Inc.  
 \* Sample data from 6/99 through 12/06 collected, compiled and reported by Weston Solutions, Inc.  
 \* Sample data from 3/07 collected, compiled and reported by Golder Associates.  
 \* Sample data from 11/07 thru current was collected, compiled and reported by S&ME.  
 \* Laboratory data prior to November 2007 was not validated by S&ME. Solid Waste Section Limits = NCPQL from 9/14/94 through 12/5/06 and NCSWSL for 5/30/07 and later  
 Current NCPQL Standards effective January 1, 2010  
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Table 5  
 Summary of Historically Detected Constituents in Groundwater  
 City of Durham Closed Municipal Solid Waste Landfill  
 S&ME Project No. 1054-07-469  
 Permit No. 32-01

Detected Monitoring Constituents/Analytes	Units	Sample Date	Detection Limit	Quantitation Limit	Solid Waste Section Limits	Background Well MW-9R	MW-2	MW-3R	MW-4R	MW-5	MW-7R	MW-8	MW-10	Equipment Blank	Trip Blank	
Siber - (NC 2L = 20 ug/L) SWID # = 184	ug/L	9/19/1994	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	12/21/1994	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	2/7/1995	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	3/13/1995	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	11/1/1995	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	6/10/1996	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	11/12/1996	--	--	1	NM	2	NM	--	ND	--	ND	--	--	--	
	ug/L	3/18/1997	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	10/21/1997	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	5/26/1998	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	12/1/1998	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	6/7/1999	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	7/8/1999	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	12/13/1999	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	8/6/2000	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	12/27/2000	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	6/4/2001	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	12/2/2001	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	6/10/2002	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	12/16/2002	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	6/9/2003	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	12/8/2003	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	6/29/2004	--	--	1	NM	1	NM	--	ND	--	ND	--	--	--	
	ug/L	12/29/2004	--	--	1	NM	1	NM	--	ND	--	ND	--	--	--	
	ug/L	6/5/2005	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	12/5/2005	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	6/5/2006	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	12/5/2006	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	5/30/2007	2	10	10	NM	ND	NM	2.0 J	ND	ND	ND	ND	ND	ND	
	ug/L	11/19/2007	2.5	10	10	NM	<2.5	NM	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	
	ug/L	5/19/2008	2.5	10	10	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	
	ug/L	11/19/2008	3.2	10	10	<3.2	<3.2	<3.2	<3.2	<3.2	<3.2	<3.2	<3.2	<3.2	<3.2	
	ug/L	6/30/2009	3.2	10	10	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
	ug/L	11/30/2009	1.9	10	10	<1.90	<1.90	<1.90	<1.90	2.87 J	<1.90	<1.90	<1.90	<1.90	<1.90	
	ug/L	5/20/2010	1.9	10	10	<1.90	<1.90	2.11 J	<1.90	<1.90	<1.90	<1.90	<1.90	<1.90	<1.90	
	ug/L	11/19/2010	1.9	10	10	<1.90	<1.90	<1.90	<1.90	<1.90	<1.90	<1.90	<1.90	<1.90	<1.90	
	ug/L	5/19/2011	1.9	10	10	<1.90	<1.90	<1.90	<1.90	NS	<1.90	<1.90	<1.90	<1.90	<1.90	
	Thallium - (GPS = 0.28 ug/L) SWID # = 194	ug/L	9/19/1994	--	--	5	NM	ND	NM	--	6.1	--	6.1	--	--	--
		ug/L	12/21/1994	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--
		ug/L	2/7/1995	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--
ug/L		3/13/1995	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		11/1/1995	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		6/10/1996	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		11/12/1996	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		3/18/1997	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		10/21/1997	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		5/26/1998	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		12/1/1998	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		6/7/1999	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		7/8/1999	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		12/13/1999	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		8/6/2000	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		12/27/2000	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		6/4/2001	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		12/2/2001	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		6/10/2002	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		12/16/2002	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		6/9/2003	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		12/8/2003	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		6/29/2004	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		12/29/2004	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		6/5/2005	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		12/5/2005	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		6/5/2006	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		12/5/2006	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		5/30/2007	0.44	0.05	5.5	NM	ND	NM	ND	ND	ND	ND	ND	ND	ND	
ug/L		11/19/2007	0.09	1	5.5	NM	<0.09	NM	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	
ug/L		5/19/2008	0.09	1	5.5	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	
ug/L		11/19/2008	0.22	1	5.5	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	
ug/L		6/30/2009	0.036	1	5.5	<0.036	<0.036	<0.036	<0.036	<0.036	<0.036	<0.036	<0.036	<0.036	<0.036	
ug/L		11/30/2009	0.11	5	5.5	<0.55 LD	<0.11	<0.11	3.14 JD	<0.55 LD	<0.55 LD	0.78 JD	<0.55 LD	<0.11	<0.11	
ug/L		5/20/2010	0.11	5	5.5	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	
ug/L		11/19/2010	0.11	5	5.5	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	
ug/L		5/19/2011	0.11	5	5.5	<0.11	<0.11	<0.11	<0.11	<0.11	NS	<0.11	<0.11	<0.11	<0.11	

Notes:  
 ug/L = micrograms per liter  
 mg/L = milligrams per liter  
 S.U. = Standard Units  
 NTU = Nephelometric Turbidity Units  
 mV = millivolts  
 ND = Not detected at the stated reporting limit  
 ORP = Oxidation Reduction Potential  
 µS/cm = micro Siemens per centimeter  
 -- = no data available  
 Blanks = field, trip and method blanks  
 NM = not measured/analyzed  
 NS = not sampled  
 \* Sample data from 9/94 through 12/98 compiled and reported by Malcolm Pirnie, Inc.  
 \* Sample data from 6/99 through 12/06 collected, compiled and reported by Weston Solutions, Inc.  
 \* Sample data from 5/07 collected, compiled and reported by Golder Associates.  
 \* Sample data from 1/07 data current was collected, compiled and reported by S&ME.  
 \* Laboratory data prior to November 2007 was not validated by S&ME. Solid Waste Section Limits = NCPQL from 9/14/94 through 12/5/06 and NCSWSL for 5/30/07 and later  
 Current NCAC 2L Standards effective January 1, 2010.  
 GPS = Groundwater protection standard

Table 5  
Summary of Historically Detected Constituents in Groundwater  
City of Durham Closed Municipal Solid Waste Landfill  
S&ME Project No. 1054-07-460  
Permit No. 32-01

Detected Monitoring Constituent/Analytes	Units	Sample Date	Detection Limit	Quantitation Limit	Solid Waste Section Limits	Background Well MW-9R	MW-2	MW-3R	MW-4R	MW-5	MW-7R	MW-8	MW-10	Equipment Blank	Trip Blank
Vanadium (GPS = 0.3 ug/L) SWD # = 209	ug/L	9/19/1994	--	--	5	NM	23	NM	--	411	--	122	--	--	--
	ug/L	12/21/1994	--	--	5	NM	ND	NM	--	124	--	7.9	--	--	--
	ug/L	2/7/1995	--	--	5	NM	ND	NM	--	99	--	6	--	--	--
	ug/L	3/13/1995	--	--	5	NM	ND	NM	--	85	--	9.4	--	--	--
	ug/L	11/11/1995	--	--	5	NM	ND	NM	--	16	--	7	--	--	--
	ug/L	6/10/1996	--	--	5	NM	ND	NM	--	14	--	ND	--	--	--
	ug/L	11/12/1996	--	--	5	NM	ND	NM	--	25	--	12	--	--	--
	ug/L	3/18/1997	--	--	5	NM	ND	NM	--	5	--	ND	--	--	--
	ug/L	10/21/1997	--	--	5	NM	ND	NM	--	ND	--	5.8	--	--	--
	ug/L	5/26/1998	--	--	5	NM	ND	NM	--	ND	--	5	--	--	--
	ug/L	12/1/1998	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--
	ug/L	6/7/1999	--	--	5	NM	ND	NM	--	11	--	ND	--	--	--
	ug/L	7/8/1999	--	--	5	NM	--	NM	--	--	--	--	--	--	--
	ug/L	12/18/1999	--	--	5	NM	ND	NM	6	6	--	6	--	--	--
	ug/L	6/6/2000	--	--	5	NM	ND	NM	ND	23	--	6	--	--	--
	ug/L	12/27/2000	--	--	5	NM	ND	NM	ND	44	--	ND	--	--	--
	ug/L	6/4/2001	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	--
	ug/L	12/3/2001	--	--	5	NM	ND	NM	ND	26	--	ND	--	--	--
	ug/L	6/10/2002	--	--	5	NM	ND	NM	ND	8	--	9	--	--	--
	ug/L	12/18/2002	--	--	5	NM	ND	NM	ND	ND	--	17	--	--	--
	ug/L	6/9/2003	--	--	5	NM	ND	NM	ND	ND	--	9	--	--	--
	ug/L	12/8/2003	--	--	5	NM	ND	NM	ND	43	--	5	--	--	--
	ug/L	6/29/2004	--	--	5	NM	ND	NM	ND	17	--	12	--	--	--
	ug/L	12/20/2004	--	--	5	NM	ND	NM	ND	69	--	5	--	--	--
	ug/L	6/5/2005	--	--	5	NM	ND	NM	ND	17	--	ND	--	--	--
	ug/L	12/5/2005	--	--	5	NM	ND	NM	ND	16	--	16	--	--	--
	ug/L	6/5/2006	--	--	5	NM	ND	NM	ND	42	--	7	--	--	--
	ug/L	12/5/2006	--	--	5	NM	ND	NM	ND	ND	--	7	--	--	--
	ug/L	5/30/2007	1	10	25	NM	1	25	NM	ND	ND	ND	--	ND	ND
	ug/L	11/9/2007	2.9	10	25	NM	3.4 J	NM	10	3.8	17	17	--	ND	ND
	ug/L	5/19/2008	2.9	10	25	4.0	ND	ND	9.0	ND	ND	ND	--	ND	NM
	ug/L	11/9/2008	1.9	10	25	<1.9	<1.9	<1.9	2.3 J	<1.9	<1.9	<1.9	3.6 J	<1.9	NM
	ug/L	6/30/2009	0.7	10	25	<0.7	<0.7	<0.7	1.1 J	<0.7	<0.7	<0.7	6.9 J	<0.7	NM
	ug/L	11/30/2009	1.4	10	25	1.58 J	<1.40	<1.40	2.48 J	<1.40	<1.40	<1.40	2.29 J	<1.40	NM
	ug/L	5/20/2010	1.4	10	25	<1.40	<1.40	<1.40	3.25 J	<1.40	<1.40	<1.40	3.60 J	<1.40	NM
	ug/L	11/9/2010	1.4	10	25	3.74 J	<1.40	<1.40	1.47 J	<1.40	<1.40	<1.40	<1.40	<1.40	NM
	ug/L	5/19/2011	1.4	10	25	<1.4	3.86 J	<1.40	1.47 J	<1.40	<1.40	NS	NS	3.89 J	<1.40
	Zinc (NC 2L = 1,000 ug/L) SWD # = 213	ug/L	9/19/1994	--	--	10	NM	34	NM	--	1008	--	207	--	--
		ug/L	12/21/1994	--	--	10	NM	ND	NM	--	302	--	ND	--	--
		ug/L	2/7/1995	--	--	10	NM	ND	NM	--	20	--	ND	--	--
		ug/L	3/13/1995	--	--	10	NM	ND	NM	--	183	--	70	--	--
		ug/L	11/11/1995	--	--	10	NM	ND	NM	--	185	--	59	--	--
		ug/L	6/10/1996	--	--	10	NM	ND	NM	--	225	--	ND	--	--
ug/L		11/12/1996	--	--	10	NM	ND	NM	--	ND	--	ND	--	--	
ug/L		3/18/1997	--	--	10	NM	ND	NM	--	26	--	11	--	--	
ug/L		10/21/1997	--	--	10	NM	23	NM	--	ND	--	ND	--	--	
ug/L		5/26/1998	--	--	10	NM	ND	NM	--	ND	--	ND	--	--	
ug/L		12/1/1998	--	--	10	NM	11	NM	--	ND	--	ND	--	--	
ug/L		6/7/1999	--	--	10	NM	31	NM	--	31	--	92	--	--	
ug/L		7/8/1999	--	--	10	NM	8	NM	--	64	--	50	--	--	
ug/L		12/18/1999	--	--	10	NM	88	NM	--	56	--	33	--	--	
ug/L		6/6/2000	--	--	10	NM	17	NM	--	28	--	ND	--	--	
ug/L		12/27/2000	--	--	10	NM	28	NM	--	287	--	414	--	--	
ug/L		6/4/2001	--	--	10	NM	24	NM	--	162	--	269	--	--	
ug/L		12/3/2001	--	--	10	NM	59	NM	--	214	--	55	--	--	
ug/L		6/10/2002	--	--	10	NM	53	NM	--	141	--	20	--	--	
ug/L		12/16/2002	--	--	10	NM	42	NM	--	26	--	14	--	--	
ug/L		6/9/2003	--	--	10	NM	19	NM	--	10	--	ND	--	--	
ug/L		12/8/2003	--	--	10	NM	18	NM	--	13	--	11	--	--	
ug/L		6/29/2004	--	--	10	NM	40	NM	--	ND	--	59	--	--	
ug/L		12/29/2004	--	--	10	NM	52	NM	--	ND	--	134	--	--	
ug/L		6/5/2005	--	--	10	NM	44	NM	--	103	--	55	--	--	
ug/L		12/5/2005	--	--	10	NM	74	NM	--	ND	--	35	--	--	
ug/L		6/5/2006	--	--	10	NM	31	NM	--	ND	--	98	--	--	
ug/L		12/5/2006	--	--	10	NM	14	NM	--	ND	--	ND	--	--	
ug/L		5/30/2007	1	10	10	NM	10.4 B	NM	11 B	20	3.3 B	12.3	4.4 B	2.4 J	ND
ug/L		11/9/2007	3	10	10	NM	21	43	NM	20	66	52	90	58	3.0
ug/L		5/19/2008	3	10	10	12	8.7	45	45	30	34	34	4.4	26	<3.0
ug/L		11/9/2008	3.3	10	10	14	7.7	14	23	23	58	26	9.8 J	26	<3.3
ug/L		6/30/2009	3.4	10	10	5.8 J	7.5 J	7.5 J	3.5 J	<3.4	<3.4	47.1	<3.4	22.4	15.2
ug/L		11/30/2009	3.8	10	10	5.99 J	6.40 J	6.40 J	3.80 J	<3.80	<3.80	11.7	<3.80	19.9	<3.80
ug/L		5/20/2010	3.8	10	10	5.76 J	<3.80	<3.80	<3.80	<3.80	<3.80	4.15 J	<3.80	90.3	<3.80
ug/L		11/9/2010	3.8	10	10	<3.80	<3.80	<3.80	<3.80	<3.80	<3.80	<3.80	<3.80	11.5	<3.80
ug/L		5/19/2011	3.8	10	10	6.26 J	7.80 J	<3.80	<3.80	<3.80	<3.80	NS	NS	9.03 J	4.26 J

Notes:  
ug/L = micrograms per liter  
mg/L = milligrams per liter  
S.U. = Standard Units  
NTU = Nephelometric Turbidity Units  
mV = millivolts  
ND = Not detected at the stated reporting limit  
ORP = Oxidation Reduction Potential  
µS/cm = micro Siemens per centimeter  
-- = no data available  
Blanks = field, trip and method blanks  
NM = not measured/analyzed  
NS = not sampled  
\* Sample data from 9/94 through 12/98 compiled and reported by Malcolm Pirnie, Inc.  
\* Sample data from 6/99 through 12/06 collected, compiled and reported by Weston Solutions, Inc.  
\* Sample data from 5/07 collected, compiled and reported by Golden Associates.  
\* Sample data from 11/07 thru current was collected, compiled and reported by S&ME.  
\* Laboratory data prior to November 2007 was not validated by S&ME. Solid Waste Section Limits = NCPQL from 9/14/94 through 12/5/06 and NCSWSL for 5/30/07 and later  
Current NCAAC II Standards effective January 1, 2010.  
GPS = Groundwater protection standard

Table 5  
 Summary of Historically Detected Constituents in Groundwater  
 City of Durham Closed Municipal Solid Waste Landfill  
 S&ME Project No. 1054-07-469  
 Permit No. 32-01

Detected Monitoring Constituents/Analytes	Units	Sample Date	Detection Limit	Quantitation Limit	Solid Waste Section Limits	Background Well MW-9R	MW-2	MW-3R	MW-4R	MW-5	MW-7R	MW-8	MW-10	Equipment Blank	Trip Blank	
Aroclor - (NC 2L = 6,000 ug/L) SWID # 3	ug/L	9/19/1994	--	--	--	NM	--	NM	--	--	--	--	--	--	--	
	ug/L	12/2/1994	--	--	--	NM	--	NM	--	--	--	--	--	--	--	
	ug/L	2/7/1995	--	--	--	NM	ND	NM	--	ND	--	49.8	--	--	--	
	ug/L	3/13/1995	--	--	--	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	11/1/1995	--	--	--	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	6/10/1996	--	--	25	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	11/13/1996	--	--	25	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	3/18/1997	--	--	25	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	10/2/1997	--	--	25	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	5/26/1998	--	--	20	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	12/1/1998	--	--	20	NM	ND	NM	--	ND	--	235	--	ND	--	
	ug/L	2/26/1999	--	--	20	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	6/7/1999	--	--	20	NM	ND	NM	--	ND	--	ND	--	ND	--	
	ug/L	7/8/1999	--	--	20	NM	ND	NM	ND	ND	--	ND	--	ND	--	
	ug/L	12/18/1999	--	--	50	NM	ND	NM	ND	ND	--	ND	--	ND	--	
	ug/L	6/6/2000	--	--	50	NM	ND	NM	ND	ND	--	ND	--	ND	--	
	ug/L	12/27/2000	--	--	20	NM	ND	NM	ND	ND	--	ND	--	ND	--	
	ug/L	6/4/2001	--	--	20	NM	ND	NM	ND	ND	--	ND	--	ND	--	
	ug/L	12/2/2001	--	--	20	NM	ND	NM	ND	ND	--	ND	--	ND	--	
	ug/L	6/10/2002	--	--	20	NM	ND	NM	ND	ND	--	ND	--	ND	--	
	ug/L	12/16/2002	--	--	20	NM	ND	NM	ND	ND	--	ND	--	ND	--	
	ug/L	6/9/2003	--	--	20	NM	ND	NM	ND	ND	--	ND	--	ND	--	
	ug/L	12/8/2003	--	--	20	NM	ND	NM	ND	ND	--	ND	--	ND	--	
	ug/L	6/29/2004	--	--	20	NM	ND	NM	ND	ND	--	ND	--	ND	--	
	ug/L	12/29/2004	--	--	10	NM	ND	NM	ND	ND	ND	ND	--	ND	--	
	ug/L	6/6/2005	--	--	10	NM	ND	NM	ND	ND	ND	ND	--	ND	--	
	ug/L	12/5/2005	2.5	--	10	NM	ND	NM	ND	ND	ND	ND	--	ND	--	
	ug/L	6/5/2006	--	--	10	NM	ND	NM	ND	ND	ND	ND	--	ND	--	
	ug/L	12/5/2006	--	--	10	NM	ND	NM	ND	ND	ND	ND	--	ND	--	
	ug/L	5/30/2007	0.9	5	100	NM	ND	NM	ND	ND	ND	1.7 B	--	3.8 J	3.2 J	
	ug/L	11/19/2007	8.9	50	100	NM	<8.9	NM	<8.9	<8.9	<8.9	<8.9	--	<8.9	<8.9	
	ug/L	5/19/2008	8.9	50	100	<8.9	<8.9	<8.9	<8.9	<8.9	<8.9	<8.9	--	1.1	1.1	
	ug/L	11/19/2008	8.9	50	100	<8.9	<8.9	<8.9	<8.9	<8.9	<8.9	<8.9	--	<8.9	<8.9	
	ug/L	6/30/2009	1.5	50	100	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	
	ug/L	11/30/2009	1.5	50	100	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	
	ug/L	5/20/2010	1.5	50	100	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	
	ug/L	11/19/2010	3	50	100	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	
	ug/L	5/19/2011	1.2	5	100	<1.2	<1.2	<1.2	<1.2	<1.2	NS	NS	<1.2	<1.2	<1.2	
	Benzene - (NC 2L = 1 ug/L) SWID # 16	ug/L	9/19/1994	--	--	--	NM	--	NM	--	--	--	--	--	--	--
		ug/L	12/2/1994	--	--	--	NM	ND	NM	--	ND	--	ND	--	--	--
ug/L		2/7/1995	--	--	--	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		3/13/1995	--	--	--	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		11/1/1995	--	--	--	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		6/10/1996	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		9/3/1996	--	--	20	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		10/2/1996	--	--	--	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		11/2/1996	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		3/18/1997	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		10/2/1997	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		5/26/1998	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		12/1/1998	--	--	1	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		6/7/1999	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		7/8/1999	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
ug/L		12/15/1999	--	--	5	NM	ND	NM	ND	ND	--	ND	--	ND	--	
ug/L		6/6/2000	--	--	5	NM	ND	NM	ND	ND	--	ND	--	ND	--	
ug/L		12/27/2000	--	--	5	NM	ND	NM	ND	ND	--	ND	--	ND	--	
ug/L		6/4/2001	--	--	5	NM	ND	NM	ND	ND	--	ND	--	ND	--	
ug/L		12/3/2001	--	--	5	NM	ND	NM	ND	ND	--	ND	--	ND	--	
ug/L		6/10/2002	--	--	5	NM	ND	NM	ND	ND	--	ND	--	ND	--	
ug/L		12/16/2002	--	--	5	NM	ND	NM	ND	ND	--	ND	--	ND	--	
ug/L		6/9/2003	--	--	5	NM	ND	NM	ND	ND	--	ND	--	ND	--	
ug/L		12/8/2003	--	--	3	NM	ND	NM	ND	ND	--	ND	--	ND	--	
ug/L		6/29/2004	--	--	3	NM	ND	NM	ND	ND	ND	ND	--	ND	--	
ug/L		12/29/2004	--	--	0.5	NM	ND	NM	ND	ND	ND	ND	--	ND	--	
ug/L		6/5/2005	--	--	0.5	NM	ND	NM	ND	ND	ND	ND	--	ND	--	
ug/L		12/5/2005	0.14	--	0.5	NM	ND	NM	ND	ND	ND	ND	--	ND	--	
ug/L		6/5/2006	--	--	0.5	NM	ND	NM	ND	ND	ND	ND	--	ND	--	
ug/L		12/5/2006	--	--	0.5	NM	ND	NM	ND	ND	ND	ND	--	ND	--	
ug/L		5/30/2007	0.12	1	1	NM	ND	NM	ND	ND	ND	ND	--	ND	ND	
ug/L		11/19/2007	0.29	1	1	NM	<0.29	NM	<0.29	<0.29	<0.29	<0.29	--	<0.29	<0.29	
ug/L		5/19/2008	0.29	1	1	<0.29	<0.29	<0.29	<0.29	<0.29	<0.29	<0.29	--	<0.29	<0.29	
ug/L		11/19/2008	0.29	1	1	<0.29	<0.29	<0.29	<0.29	<0.29	<0.29	<0.29	4.0	<0.29	<0.29	
ug/L		6/30/2009	0.20	1	1	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	4.6 JD	<0.20	<0.20	
ug/L		11/30/2009	0.20	1	1	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	1.8	<0.20	<0.20	
ug/L		5/20/2010	0.050	1	1	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.89	<0.050	<0.050	
ug/L		11/19/2010	0.200	1	1	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	2.3 D	<0.20	<0.20	
ug/L		5/19/2011	0.080	1	1	<0.08	<0.08	<0.08	<0.08	<0.08	NS	NS	1.7	<0.08	<0.08	

Notes:  
 ug/L = micrograms per liter  
 mg/L = milligrams per liter  
 S.U. = Standard Units  
 NTU = Nephelometric Turbidity Units  
 mV = millivolts  
 ND = Not detected at the stated reporting limit  
 ORP = Oxidation Reduction Potential  
 µS/cm = micro Siemens per centimeter  
 -- = no data available  
 Bk = field, trip and method blanks  
 NM = not measured/analyzed  
 NS = not sampled

\* Sample data from 9/94 through 12/98 compiled and reported by Makolin Pirnie, Inc.  
 \* Sample data from 6/99 through 12/06 collected, compiled and reported by Weston Solutions, Inc.  
 \* Sample data from 5/07 collected, compiled and reported by Golder Associates.  
 \* Sample data from 11/07 thru current was collected, compiled and reported by S&ME.  
 \* Laboratory data prior to November 2007 was not validated by S&ME. Solid Waste Section Limits = NCPQL from 9/14/94 through 12/5/06 and NCSWSL for 5/30/07 and later  
 Current NCAAC '21 Standards effective January 1, 2010.  
 GPS = Groundwater protection standard

Table 5  
 Summary of Historically Detected Constituents in Groundwater  
 City of Durham Closed Municipal Solid Waste Landfill  
 S&ME Project No. 1054-07-469  
 Permit No. 32-01

Detected Monitoring Constituent/Analytes	Units	Sample Date	Detection Limit	Quantitation Limit	Solid Waste Section Limits	Background Well MW-9R	MW-2	MW-3R	MW-4R	MW-5	MW-7R	MW-8	MW-10	Equipment Blank	Trip Blank	
Chlorobenzene - (NC 2L= 50 ug/L) SWID # = 39	ug/L	9/19/1994	--	--	--	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	12/2/1994	--	--	--	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	2/7/1995	--	--	--	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	3/13/1995	--	--	--	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	11/1/1995	--	--	--	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	6/10/1996	--	--	--	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	9/3/1996	--	--	--	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	10/21/1996	--	--	--	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	11/23/1996	--	--	--	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	3/18/1997	--	--	--	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	10/2/1997	--	--	--	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	12/1/1998	--	--	--	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	6/7/1999	--	--	--	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	7/8/1999	--	--	--	NM	ND	NM	ND	ND	--	ND	--	--	--	
	ug/L	12/11/1999	--	--	--	NM	ND	NM	ND	ND	--	ND	--	--	--	
	ug/L	6.6/2000	--	--	--	NM	ND	NM	ND	ND	--	ND	--	--	--	
	ug/L	12/27/2000	--	--	--	NM	ND	NM	ND	ND	--	ND	--	--	--	
	ug/L	6/4/2001	--	--	--	NM	ND	NM	ND	ND	--	ND	--	--	--	
	ug/L	12/5/2001	--	--	--	NM	ND	NM	ND	ND	--	ND	--	--	--	
	ug/L	6/10/2002	--	--	--	NM	ND	NM	ND	ND	--	ND	--	--	--	
	ug/L	12/10/2002	--	--	--	NM	ND	NM	ND	ND	--	ND	--	--	--	
	ug/L	6/5/2003	--	--	--	NM	ND	NM	ND	ND	--	ND	--	--	--	
	ug/L	12/8/2003	--	--	1	NM	ND	NM	ND	ND	--	ND	--	ND	--	
	ug/L	6/29/2004	--	--	1	NM	ND	NM	ND	ND	--	ND	--	ND	--	
	ug/L	12/29/2004	--	--	1	NM	ND	NM	ND	ND	--	ND	--	ND	--	
	ug/L	6/5/2005	--	--	1	NM	ND	NM	ND	ND	--	ND	--	ND	--	
	ug/L	12/5/2005	0.24	--	1	NM	ND	NM	ND	ND	--	ND	--	ND	--	
	ug/L	6/5/2006	--	--	1	NM	ND	NM	ND	ND	--	ND	--	ND	--	
	ug/L	12/5/2006	--	--	1	NM	ND	NM	ND	ND	--	ND	--	ND	--	
	ug/L	5/30/2007	0.16	1	3	NM	ND	NM	ND	ND	--	ND	--	ND	ND	
	ug/L	11/19/2007	0.26	1	3	NM	-0.26	NM	1	-0.26	-0.26	-0.26	-0.26	-0.26	-0.26	
	ug/L	5/19/2008	0.26	1	3	-0.26	-0.26	-0.26	-0.26	-0.26	-0.26	-0.26	-0.26	-0.26	-0.26	
	ug/L	11/19/2008	0.26	1	3	-0.26	-0.26	-0.26	-0.26	-0.26	-0.26	-0.26	-0.26	-0.26	-0.26	
	ug/L	6/30/2009	0.27	1	3	-0.27	-0.27	-0.27	0.41 J	-0.27	-0.27	-0.27	-0.27	-0.27	-0.27	
	ug/L	11/30/2009	0.27	1	3	-0.27	-0.27	-0.27	-0.27	-0.27	-0.27	-0.27	-0.27	-0.27	-0.27	
	ug/L	5/20/2010	0.069	1	3	-0.069	-0.069	-0.069	-0.069	-0.069	-0.069	-0.069	-0.069	-0.069	-0.069	
	ug/L	11/19/2010	0.54	1	3	-0.54	-0.54	-0.54	-0.54	-0.54	-0.54	-0.54	-0.54	-0.54	-0.54	
	ug/L	5/19/2011	0.74	1	3	-0.74	-0.74	-0.74	-0.74	-0.74	NS	-0.74	-0.74	-0.74	-0.74	
	1,4-Dichlorobenzene - (NC 2L= 6.0 ug/L) SWID # = 71	ug/L	12/8/2003	--	--	1	NM	ND	NM	ND	ND	--	ND	--	ND	--
		ug/L	6/28/2004	--	--	1	NM	ND	NM	ND	ND	--	ND	--	ND	--
ug/L		12/29/2004	--	--	1	NM	ND	NM	ND	ND	--	ND	--	ND	--	
ug/L		6/5/2005	--	--	1	NM	ND	NM	ND	ND	--	ND	--	ND	--	
ug/L		12/5/2005	0.32	--	1	NM	ND	NM	ND	ND	--	ND	--	ND	--	
ug/L		6/5/2006	--	--	1	NM	ND	NM	ND	ND	--	ND	--	ND	--	
ug/L		12/5/2006	--	--	1	NM	ND	NM	ND	ND	--	ND	--	ND	--	
ug/L		5/30/2007	0.15	1	1	NM	ND	NM	ND	ND	--	ND	--	ND	ND	
ug/L		11/19/2007	0.3	1	1	NM	<3.0	NM	1	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	
ug/L		5/19/2008	0.3	1	1	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	
ug/L		11/19/2008	0.3	1	1	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	
ug/L		6/30/2009	0.38	1	1	-0.38	-0.38	-0.38	-0.38	-0.38	-0.38	-0.38	-0.38	-0.38	-0.38	
ug/L		11/30/2009	0.38	1	1	-0.38	-0.38	-0.38	-0.38	-0.38	-0.38	-0.38	-0.38	-0.38	-0.38	
ug/L		5/20/2010	0.1	1	1	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	
ug/L		11/19/2010	0.38	1	1	-0.38	-0.38	-0.38	-0.38	-0.38	-0.38	-0.38	-0.38	-0.38	-0.38	
ug/L		5/19/2011	0.79	1	1	-0.79	-0.79	-0.79	-0.79	-0.79	-0.79	-0.79	-0.79	-0.79	-0.79	
1,1-Dichloroethane - (NC 2L= 6 ug/L) SWID # = 75		ug/L	12/8/2003	--	--	5	NM	ND	NM	ND	ND	--	ND	--	ND	--
		ug/L	6/28/2004	--	--	5	NM	ND	NM	ND	ND	--	ND	--	ND	--
		ug/L	12/29/2004	--	--	1	NM	ND	NM	ND	ND	--	ND	--	ND	--
		ug/L	6/5/2005	--	--	1	NM	ND	NM	ND	ND	--	ND	--	ND	--
		ug/L	12/5/2005	0.38	--	1	NM	ND	NM	ND	ND	--	ND	--	ND	--
		ug/L	6/5/2006	--	--	1	NM	ND	NM	ND	ND	--	ND	--	ND	--
		ug/L	12/5/2006	--	--	1	NM	ND	NM	ND	ND	--	ND	--	ND	--
		ug/L	5/30/2007	0.09	1	1	NM	ND	NM	ND	ND	--	ND	--	ND	ND
		ug/L	11/19/2007	0.31	1	5	NM	-0.31	NM	1	-0.31	-0.31	-0.31	-0.31	-0.31	-0.31
		ug/L	5/19/2008	0.31	1	5	-0.31	-0.31	-0.31	-0.31	-0.31	-0.31	-0.31	-0.31	-0.31	-0.31
		ug/L	11/19/2008	0.31	1	5	-0.31	-0.31	-0.31	-0.31	-0.31	-0.31	-0.31	-0.31	-0.31	-0.31
		ug/L	6/30/2009	0.24	1	5	-0.24	-0.24	-0.24	-0.24	-0.24	-0.24	-0.24	-0.24	-0.24	-0.24
		ug/L	11/30/2009	0.33	1	5	-0.33	-0.33	-0.33	-0.33	-0.33	-0.33	-0.33	-0.33	-0.33	-0.33
		ug/L	5/20/2010	0.05	1	5	-0.050	-0.050	-0.050	-0.050	-0.050	-0.050	-0.050	-0.050	-0.050	-0.050
		ug/L	11/19/2010	0.33	1	5	-0.33	-0.33	-0.33	-0.33	-0.33	-0.33	-0.33	-0.33	-0.33	-0.33
		ug/L	5/19/2011	0.8	1	5	-0.8	-0.8	-0.8	-0.8	-0.8	NS	-0.8	-0.8	-0.8	-0.8

Notes:  
 ug/L = micrograms per liter  
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 NTU = Nephelometric Turbidity Units  
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 \* Sample data from 9/94 through 12/98 compiled and reported by Malcolm Pirnie, Inc.  
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 \* Sample data from 5/07 collected, compiled and reported by Golden Associates.  
 \* Sample data from 11/07 thru current was collected, compiled and reported by S&ME.  
 \* Laboratory data prior to November 2007 was not validated by S&ME. Solid Waste Section Limits = NCPQL from 9/14/94 through 12/5/06 and NCSWSL for 5/30/07 and later  
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Table 5  
 Summary of Historically Detected Constituents in Groundwater  
 City of Durham Closed Municipal Solid Waste Landfill  
 S&ME Project No. 1054-07-469  
 Permit No. 32-01

Detected Monitoring Constituents/Analytes	Units	Sample Date	Detection Limit	Quantitation Limit	Solid Waste Section Limits	Background Well MW-9R	MW-2	MW-3R	MW-4R	MW-5	MW-7R	MW-8	MW-10	Equipment Blank	Trip Blank		
cis-1,2-Dichloroethene - (NC 2L = 70 ug/L) SWID # = 78	ug/L	9/25/1994	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	1/22/1994	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	2/7/1995	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	3/13/1995	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	1/11/1995	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	6/7/1996	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	9/3/1996	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	11/13/1996	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	3/18/1997	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	10/2/1997	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	12/1/1998	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	6/7/1999	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	7/8/1999	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	12/23/1999	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	6/6/2000	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	12/13/2000	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	6/4/2001	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	12/23/2001	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	6/10/2002	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	12/16/2002	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	6/6/2003	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	12/8/2003	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	6/28/2004	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	12/20/2004	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	6/5/2005	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	12/5/2005	0.47	--	--	NM	1.1	NM	--	--	--	--	--	--	--		
	ug/L	6/5/2006	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	12/5/2006	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	5/30/2007	0.14	1	5	NM	ND	NM	ND	ND	ND	ND	ND	ND	ND		
	ug/L	11/19/2007	0.38	1	5	NM	ND	NM	ND	ND	ND	ND	ND	ND	ND		
	ug/L	5/19/2008	0.38	1	5	<-0.38	<-0.38	<-0.38	<-0.38	<-0.38	<-0.38	<-0.38	<-0.38	<-0.38	<-0.38		
	ug/L	11/19/2008	0.38	1	5	<-0.38	0.81 J	<-0.38	<-0.38	<-0.38	<-0.38	<-0.38	<-0.38	370	<-0.38	<-0.38	
	ug/L	6/30/2009	0.36	1	5	<-0.36	<-0.36	<-0.36	<-0.36	<-0.36	<-0.36	<-0.36	<-0.36	370 D	<-0.36	<-0.36	
	ug/L	11/30/2009	0.36	1	5	<-0.36	<-0.36	<-0.36	<-0.36	<-0.36	<-0.36	<-0.36	<-0.36	190	<-0.36	<-0.36	
	ug/L	5/20/2010	0.75	1	5	<-0.075	<-0.075	<-0.075	<-0.075	<-0.075	<-0.075	<-0.075	<-0.075	86	<-0.075	<-0.075	
ug/L	11/19/2010	0.36	1	5	<-0.36	1.4 J	<-0.36	<-0.36	<-0.36	<-0.36	<-0.36	<-0.36	210 D	<-0.36	<-0.36		
ug/L	5/19/2011	0.72	1	5	<-0.72	<-0.72	<-0.72	<-0.72	<-0.72	<-0.72	<-0.72	<-0.72	110	<-0.72	<-0.72		
trans-1,2-Dichloroethene - (NC 2L = 100 ug/L) SWID # = 79	ug/L	12/8/2003	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	6/28/2004	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	12/20/2004	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	6/5/2005	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	12/5/2005	0.56	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	6/5/2006	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	12/5/2006	--	--	--	NM	--	NM	--	--	--	--	--	--	--		
	ug/L	5/30/2007	0.1	1	5	NM	ND	NM	ND	ND	ND	ND	ND	ND	ND		
	ug/L	11/19/2007	0.3	1	5	NM	<-0.3	NM	<-0.3	<-0.3	<-0.3	<-0.3	<-0.3	<-0.3	<-0.3		
	ug/L	5/19/2008	0.3	1	5	<-0.3	<-0.3	<-0.3	<-0.3	<-0.3	<-0.3	<-0.3	<-0.3	<-0.3	<-0.3		
	ug/L	11/19/2008	0.3	1	5	<-0.3	<-0.3	<-0.3	<-0.3	<-0.3	<-0.3	<-0.3	<-0.3	12.0	<-0.3	<-0.3	
	ug/L	6/30/2009	0.34	1	5	<-0.34	<-0.34	<-0.34	<-0.34	<-0.34	<-0.34	<-0.34	<-0.34	9.7 D	<-0.34	<-0.34	
	ug/L	11/30/2009	0.34	1	5	<-0.34	<-0.34	<-0.34	<-0.34	<-0.34	<-0.34	<-0.34	<-0.34	4.7 J	<-0.34	<-0.34	
	ug/L	5/20/2010	0.11	1	5	<-0.11	<-0.11	<-0.11	<-0.11	<-0.11	<-0.11	<-0.11	<-0.11	1.8 J	<-0.11	<-0.11	
	ug/L	11/19/2010	0.34	1	5	<-0.34	<-0.34	<-0.34	<-0.34	<-0.34	<-0.34	<-0.34	<-0.34	4.9 JD	<-0.34	<-0.34	
	ug/L	5/19/2011	0.12	1	5	<-0.12	<-0.12	<-0.12	<-0.12	<-0.12	<-0.12	<-0.12	<-0.12	4.2 J	<-0.12	<-0.12	
	1,2-Dichloropropane - (NC 2L = 0.6 ug/L) SWID # = 82	ug/L	12/8/2003	--	--	--	NM	--	NM	--	--	--	--	--	--	--	
		ug/L	6/28/2004	--	--	--	NM	--	NM	--	--	--	--	--	--	--	
		ug/L	12/20/2004	--	--	--	NM	--	NM	--	--	--	--	--	--	--	
		ug/L	6/5/2005	--	--	--	NM	--	NM	--	--	--	--	--	--	--	
		ug/L	12/5/2005	0.26	--	--	NM	--	NM	--	--	--	--	--	--	--	
		ug/L	6/5/2006	--	--	--	NM	--	NM	--	--	--	--	--	--	--	
		ug/L	12/5/2006	--	--	--	NM	--	NM	--	--	--	--	--	--	--	
		ug/L	5/30/2007	0.18	1	1	NM	ND	NM	ND	ND	ND	ND	ND	ND	ND	
		ug/L	11/19/2007	0.52	1	1	NM	<-0.52	NM	<-0.52	<-0.52	<-0.52	<-0.52	<-0.52	<-0.52	<-0.52	
		ug/L	5/19/2008	0.52	1	1	<-0.52	<-0.52	<-0.52	<-0.52	<-0.52	<-0.52	<-0.52	<-0.52	<-0.52	<-0.52	
		ug/L	11/19/2008	0.52	1	1	<-0.52	<-0.52	<-0.52	<-0.52	<-0.52	<-0.52	<-0.52	<-0.52	11.0	<-0.52	<-0.52
		ug/L	6/30/2009	0.2	1	5	<-0.20	<-0.20	<-0.20	<-0.20	<-0.20	<-0.20	<-0.20	<-0.20	9.4 D	<-0.20	<-0.20
		ug/L	11/30/2009	0.2	1	5	<-0.20	<-0.20	<-0.20	<-0.20	<-0.20	<-0.20	<-0.20	<-0.20	4.7	<-0.20	<-0.20
		ug/L	5/20/2010	0.098	1	5	<-0.098	<-0.098	<-0.098	<-0.098	<-0.098	<-0.098	<-0.098	<-0.098	1.9	<-0.098	<-0.098
		ug/L	11/19/2010	0.2	1	5	<-0.20	<-0.20	<-0.20	<-0.20	<-0.20	<-0.20	<-0.20	<-0.20	5.8 D	<-0.20	<-0.20
		ug/L	5/19/2011	0.59	1	5	<-0.59	<-0.59	<-0.59	<-0.59	<-0.59	<-0.59	<-0.59	<-0.59	2.2	<-0.59	<-0.59
		Ethylbenzene - (NC 2L = 600 ug/L) SWID # = 110	ug/L	5/30/2007	--	--	--	NM	ND	NM	ND	ND	ND	ND	ND	ND	ND
			ug/L	11/19/2007	0.22	1	1	NM	0.6	NM	<-0.22	<-0.22	<-0.22	<-0.22	<-0.22	<-0.22	<-0.22
			ug/L	5/19/2008	0.22	1	1	<-0.22	<-0.22	<-0.22	<-0.22	<-0.22	<-0.22	<-0.22	<-0.22	<-0.22	<-0.22
ug/L			11/19/2008	0.22	1	1	<-0.22	<-0.22	<-0.22	<-0.22	<-0.22	<-0.22	<-0.22	<-0.22	<-0.22	<-0.22	
ug/L			6/30/2009	0.20	1	1	<-0.20	<-0.20	<-0.20	<-0.20	<-0.20	<-0.20	<-0.20	<-0.20	<-0.20	<-0.20	
ug/L			11/30/2009	0.20	1	1	<-0.20	<-0.20	<-0.20	<-0.20	<-0.20	<-0.20	<-0.20	<-0.20	<-0.20	<-0.20	
ug/L			5/20/2010	0.10	1	1	<-0.10	<-0.10	<-0.10	<-0.10	<-0.10	<-0.10	<-0.10	<-0.10	<-0.10	<-0.10	
ug/L			11/19/2010	0.20	1	1	<-0.20	<-0.20	<-0.20	<-0.20	<-0.20	<-0.20	<-0.20	<-0.20	<-0.20	<-0.20	
ug/L			5/19/2011	0.62	1	1	<-0.62	<-0.62	<-0.62	<-0.62	<-0.62	<-0.62	<-0.62	<-0.62	<-0.62	<-0.62	

Notes:  
 ug/L = microgram per liter  
 mg/L = milligram per liter  
 S.U. = Standard Units  
 NTU = Nephelometric Turbidity Units  
 mV = millivolts  
 ND = Not detected at the stated reporting limit  
 ORP = Oxidation Reduction Potential  
 µS/cm = micro Siemens per centimeter  
 -- = no data available  
 Bkns = field, trip and method blanks  
 NM = not measured/analyzed  
 NS = not sampled

\* Sample data from 9/94 through 12/98 compiled and reported by Malcolm Pirnie, Inc.  
 \* Sample data from 6/99 through 12/06 collected, compiled and reported by Weston Solutions, Inc.  
 \* Sample data from 5/07 collected, compiled and reported by Golder Associates.  
 \* Sample data from 11/07 thru current was collected, compiled and reported by S&ME.  
 \* Laboratory data prior to November 2007 was not validated by S&ME. Solid Waste Section Limits = NCPQL from 9/14/94 through 12/5/06 and NCSWSL for 5/30/07 and later  
 Current NCA/C/M Standards effective January 1, 2010.  
 GPS = Groundwater protection standard

Table 5  
 Summary of Historically Detected Constituents in Groundwater  
 City of Durham Closed Municipal Solid Waste Landfill  
 S&ME Project No. 1054-07-469  
 Permit No. 32-01

Detected Monitoring Constituents/Analytes	Units	Sample Date	Detection Limit	Quantitation Limit	Solid Waste Section Limits	Background Well MW-9R	MW-2	MW-3R	MW-4R	MW-5	MW-7R	MW-8	MW-10	Equipment Blank	Trip Blank	
Methylene Chloride (NC 2L= 5.0 ug/L) SWID # = 140	ug/L	9/23/1994	--	--	--	NM	NM	NM	--	--	--	ND	--	--	--	
	ug/L	12/2/1994	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	2/7/1995	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	3/11/1995	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	11/1/1995	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	6/7/1996	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	11/18/1996	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	3/18/1997	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	10/2/1997	--	--	5	NM	ND	NM	--	22	--	ND	--	--	--	
	ug/L	5/26/1998	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	12/1/1998	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	6/7/1999	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	7/8/1999	--	--	5	NM	ND	NM	ND	--	--	ND	--	--	--	
	ug/L	12/18/1999	--	--	5	NM	ND	NM	ND	--	--	ND	--	--	--	
	ug/L	6/6/2000	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	--	
	ug/L	12/22/2000	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	--	
	ug/L	6/4/2001	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	--	
	ug/L	12/5/2001	--	--	5	NM	ND	NM	ND	68	--	ND	--	--	--	
	ug/L	6/10/2002	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	--	
	ug/L	12/16/2002	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	--	
	ug/L	6/5/2005	--	--	2	NM	ND	NM	ND	ND	--	ND	--	--	--	
	ug/L	12/5/2005	0.61	--	2	NM	ND	NM	ND	ND	ND	ND	--	--	--	
	ug/L	6/5/2006	--	--	2	NM	ND	NM	ND	ND	ND	ND	--	--	--	
	ug/L	12/5/2006	--	--	2	NM	ND	NM	ND	ND	ND	ND	--	--	--	
	ug/L	5/30/2007	0.088	1	1	NM	ND	NM	ND	ND	ND	ND	--	--	ND	
	ug/L	11/19/2007	0.3	5	1	NM	0.17	NM	0.30	0.17	0.30	0.18	--	--	0.49	
	ug/L	5/19/2008	0.3	5	1	0.30	0.30	0.30	0.30	0.30	0.30	0.30	--	--	0.30	
	ug/L	11/19/2008	0.3	5	1	0.30	0.30	0.30	0.30	0.30	0.30	0.30	--	--	0.30	
	ug/L	6/30/2009	0.53	5	1	0.53	0.53	0.53	0.53	0.53	0.53	0.53	--	--	0.53	
	ug/L	11/30/2009	0.53	1	1	0.53	0.53	0.53	0.53	0.53	0.53	0.53	--	--	0.53	
	ug/L	5/20/2010	0.7	1	1	0.70	0.70	0.70	0.70	0.70	0.70	0.70	--	--	0.70	
	ug/L	11/19/2010	0.53	1	1	0.53	0.53	0.53	0.53	0.53	0.53	0.53	--	--	0.53	
	ug/L	5/19/2011	0.14	1	1	0.14	0.14	0.14	0.14	0.14	NS	0.14	--	--	0.14	
	Tetrachloroethene (NC 2L= 0.1 ug/L) SWID # = 192	ug/L	6/5/2005	--	--	1	NM	ND	NM	ND	ND	ND	--	--	ND	--
		ug/L	12/5/2005	0.49	--	1	NM	ND	NM	ND	ND	ND	--	--	ND	--
		ug/L	6/5/2006	--	--	1	NM	ND	NM	ND	ND	ND	--	--	ND	--
		ug/L	12/5/2006	--	--	1	NM	ND	NM	ND	ND	ND	--	--	ND	--
		ug/L	5/30/2007	0.15	1	1	NM	ND	NM	ND	ND	ND	--	--	ND	--
		ug/L	11/19/2007	0.29	1	1	NM	0.29	NM	0.29	0.29	0.29	0.29	--	--	0.29
		ug/L	5/19/2008	0.29	1	1	0.29	0.29	0.29	0.29	0.29	0.29	--	--	0.29	
ug/L		11/19/2008	0.29	1	1	0.29	0.29	0.29	0.29	0.29	0.29	--	--	0.29		
ug/L		6/30/2009	0.36	1	1	0.36	0.36	0.36	0.36	0.36	0.36	0.36	--	--	0.36	
ug/L		11/30/2009	0.36	1	1	0.36	0.36	0.36	0.36	0.36	0.36	0.36	--	--	0.36	
ug/L		5/20/2010	0.099	1	1	0.099	0.099	0.099	0.099	0.099	0.099	0.099	--	--	0.099	
ug/L		11/19/2010	0.36	1	1	0.36	0.36	0.36	0.36	0.36	0.36	0.36	--	--	0.36	
ug/L		5/19/2011	0.73	1	1	0.73	0.73	0.73	0.73	0.73	NS	0.73	--	--	0.73	
Toluene (NC 2L= 600 ug/L) SWID # = 196	ug/L	9/19/1994	--	--	--	NM	ND	NM	--	--	--	ND	--	--	--	
	ug/L	12/2/1994	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	2/7/1995	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	3/11/1995	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	11/1/1995	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	6/10/1996	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	11/18/1996	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	3/18/1997	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	10/2/1997	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	5/26/1998	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	12/1/1998	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	6/7/1999	--	--	5	NM	ND	NM	--	ND	--	ND	--	--	--	
	ug/L	7/8/1999	--	--	5	NM	ND	NM	ND	--	--	ND	--	--	--	
	ug/L	12/18/1999	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	--	
	ug/L	6/6/2000	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	--	
	ug/L	12/22/2000	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	--	
	ug/L	6/4/2001	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	--	
	ug/L	12/5/2001	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	--	
	ug/L	6/10/2002	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	--	
	ug/L	12/16/2002	--	--	5	NM	ND	NM	ND	ND	--	ND	--	--	--	
	ug/L	6/5/2005	--	--	1	NM	ND	NM	ND	ND	--	ND	--	--	--	
	ug/L	12/5/2005	0.39	1	1	NM	ND	NM	ND	ND	ND	ND	--	--	ND	
	ug/L	6/5/2006	--	--	1	NM	ND	NM	ND	ND	ND	ND	--	--	ND	
	ug/L	12/5/2006	--	--	1	NM	ND	NM	ND	ND	ND	ND	--	--	ND	
	ug/L	5/30/2007	0.15	1	1	NM	ND	NM	ND	ND	ND	ND	--	--	0.33 J	
	ug/L	11/19/2007	0.27	1	1	NM	0.27	NM	0.27	0.27	0.27	0.27	--	--	0.27	
	ug/L	5/19/2008	0.27	1	1	0.27	0.27	0.27	0.27	0.27	0.27	0.27	--	--	0.66	
	ug/L	11/19/2008	0.27	1	1	0.27	0.27	0.27	0.27	0.27	0.27	0.27	--	--	0.44 J	
	ug/L	6/30/2009	0.27	1	1	0.27	0.27	0.27	0.27	0.27	0.27	0.27	--	--	0.27	
	ug/L	11/30/2009	0.27	1	1	0.27	0.27	0.27	0.27	0.27	0.27	0.27	--	--	0.27	
	ug/L	5/20/2010	0.53	1	1	0.53	0.53	0.53	0.53	0.53	0.53	0.53	--	--	0.53	
	ug/L	11/19/2010	0.27	1	1	0.27	0.27	0.27	0.27	0.27	0.27	0.27	--	--	0.27	
	ug/L	5/19/2011	0.85	1	1	0.85	0.85	0.85	0.85	0.85	NS	0.85	--	--	0.85	

Notes:  
 ug/L = micrograms per liter  
 mg/L = milligrams per liter  
 S.U. = Standard Units  
 NTU = Nephelometric Turbidity Units  
 mV = millivolts  
 ND = Not detected at the stated reporting limit  
 ORP = Oxidation Reduction Potential  
 µS/cm = micro Siemens per centimeter  
 -- = no data available  
 Blanks = field, trip and method blanks  
 NM = not measured/analyzed  
 NS = not sampled

\* Sample data from 9/94 through 12/98 compiled and reported by Makoln Pinnie, Inc.  
 \* Sample data from 6/99 through 12/06 collected, compiled and reported by Weston Solutions, Inc.  
 \* Sample data from 5/07 collected, compiled and reported by Golder Associates.  
 \* Sample data from 11/07 thru current was collected, compiled and reported by S&ME.  
 \* Laboratory data prior to November 2007 was not validated by S&ME. Solid Waste Section Limits = NCPQL from 9/14/94 through 12/5/06 and NCSWSL for 5/07/07 and later.  
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City of Durham Closed Municipal Solid Waste Landfill  
S&ME Project No. 1054-07-469  
Permit No. 32-01

Detected Monitoring Constituents/Analytes	Units	Sample Date	Detection Limit	Quantitation Limit	Solid Waste Section Limits	Background Well MW-9K	MW-2	MW-3R	MW-4R	MW-5	MW-7R	MW-8	MW-10	Equipment Blank	Trip Blank	
Trichloroethene - (NC 2L = 3.0 ug/L) SWD # = 201	ug/L	12/8/2003	--	--	5	NM	ND	NM	ND	ND	--	ND	--	ND	--	
	ug/L	6/28/2004	--	--	5	NM	ND	NM	ND	ND	ND	ND	--	ND	--	
	ug/L	12/20/2004	--	--	2	NM	ND	NM	ND	ND	ND	ND	--	ND	--	
	ug/L	6/5/2005	--	--	2	NM	ND	NM	ND	ND	ND	ND	--	ND	--	
	ug/L	12/5/2005	0.52	--	2	NM	ND	NM	ND	ND	ND	ND	--	ND	--	
	ug/L	6/5/2006	--	--	2	NM	ND	NM	ND	ND	ND	ND	--	ND	--	
	ug/L	12/5/2006	--	--	2	NM	ND	NM	ND	ND	ND	ND	--	ND	--	
	ug/L	5/30/2007	0.23	1	1	NM	ND	NM	ND	ND	ND	ND	--	ND	ND	
	ug/L	11/19/2007	0.37	1	1	NM	<0.37	NM	<0.37	<0.37	<0.37	<0.37	--	<0.37	<0.37	
	ug/L	5/19/2008	0.13	1	1	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	<0.13	
	ug/L	11/19/2008	0.37	1	1	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	30.0	<0.37	<0.37	
	ug/L	6/30/2009	0.36	1	1	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	30.0	<0.36	<0.36	
	ug/L	11/30/2009	0.38	1	1	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	14	<0.38	<0.38	
	ug/L	5/20/2010	0.13	1	1	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	6.9	<0.13	<0.13	
	ug/L	11/19/2010	0.38	1	1	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	12.0	<0.38	<0.38	
ug/L	5/19/2011	0.72	1	1	<0.72	<0.72	<0.72	<0.72	<0.72	<0.72	<0.72	12.0	<0.72	<0.72		
Vinyl Chloride - (NC 2L = 0.01 ug/L) SWD # = 211	ug/L	12/8/2003	--	--	10	NM	ND	NM	ND	ND	--	ND	--	ND	--	
	ug/L	6/28/2004	--	--	10	NM	ND	NM	ND	ND	--	ND	--	ND	--	
	ug/L	12/20/2004	--	--	2	NM	ND	NM	ND	ND	ND	ND	--	ND	--	
	ug/L	6/5/2005	--	--	2	NM	ND	NM	ND	ND	ND	ND	--	ND	--	
	ug/L	12/5/2005	0.6	--	2	NM	ND	NM	ND	ND	ND	ND	--	ND	--	
	ug/L	6/5/2006	--	--	2	NM	ND	NM	ND	ND	ND	ND	--	ND	--	
	ug/L	12/5/2006	--	--	2	NM	ND	NM	ND	ND	ND	ND	--	ND	--	
	ug/L	5/30/2007	0.15	1	1	NM	ND	NM	ND	ND	ND	ND	--	ND	ND	
	ug/L	11/19/2007	0.27	1	1	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27	
	ug/L	5/19/2008	0.27	1	1	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27	
	ug/L	11/19/2008	0.37	1	1	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	28	<0.37	<0.37	
	ug/L	6/30/2009	0.4	1	1	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	23.0	<0.40	<0.40	
	ug/L	11/30/2009	0.1	1	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	17	<0.10	<0.10	
	ug/L	5/20/2010	0.003	1	1	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	6.8	<0.003	<0.003	
	ug/L	11/19/2010	0.003	1	1	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	17.0	<0.003	<0.003	
ug/L	5/19/2011	0.01	1	1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	12	<0.01	<0.01		
Bis(2-ethylhexyl)phthalate - (NC 2L = 3.0 ug/L) SWD # = 11	ug/L	5/19/2007	1	10	10	NM	NM	NM	NM	NM	NS	NS	NS	<0.01	<0.01	
	ug/L	11/19/2007	1.3	10	10	NM	NM	NM	NM	NM	NS	NS	NS	<0.01	<0.01	
	ug/L	5/19/2008	1.3	10	10	ND	ND	ND	ND	ND	ND	ND	ND	<0.01	<0.01	
	ug/L	11/19/2008	1.3	10	10	NM	NM	NM	NM	NM	NS	NS	NS	<0.01	<0.01	
	ug/L	6/30/2009	1.3	10	10	NM	NM	NM	NM	NM	NS	NS	NS	<0.01	<0.01	
	ug/L	11/30/2009	1.3	10	10	NM	NM	NM	NM	NM	NS	NS	NS	<0.01	<0.01	
	ug/L	5/20/2010	1.3	10	10	NM	NM	NM	NM	NM	NS	NS	NS	<0.01	<0.01	
	ug/L	11/19/2010	1.3	10	10	NM	NM	NM	NM	NM	NS	NS	NS	<0.01	<0.01	
	ug/L	5/19/2011	1.3	10	10	NM	NM	NM	NM	NM	NS	NS	NS	<0.01	<0.01	
	1,4-Naphthoquinone - (No Est. GW Standard) SWD # = 149	ug/L	5/19/2008	3.5	11	10	<3.5	<3.5	<3.5	<3.5	<3.5	18	<3.5	<3.5	<3.5	<3.5
		ug/L	11/19/2008	3.5	11	10	<3.5	<3.5	<3.5	<3.5	<3.5	18	<3.5	<3.5	<3.5	<3.5
		ug/L	6/30/2009	3.5	11	10	NM	NM	NM	NM	NM	NS	NS	NS	<3.5	<3.5
		ug/L	11/30/2009	3.5	11	10	NM	NM	NM	NM	NM	NS	NS	NS	<3.5	<3.5
		ug/L	5/20/2010	3.5	11	10	NM	NM	NM	NM	NM	NS	NS	NS	<3.5	<3.5
		ug/L	11/19/2010	3.5	11	10	NM	NM	NM	NM	NM	NS	NS	NS	<3.5	<3.5
ug/L		5/19/2011	3.5	11	10	NM	NM	NM	NM	NM	NS	NS	NS	<3.5	<3.5	
n-Nitrosodibutylamine - (No Est. GW Standard) SWD # = 162		ug/L	5/19/2008	3.5	11	10	<3.5	<3.5	<3.5	<3.5	<3.5	3.8	3.6	--	3.9	<3.5
		ug/L	11/19/2008	3.5	11	10	<3.5	<3.5	<3.5	<3.5	<3.5	3.8	3.6	--	3.9	<3.5
		ug/L	6/30/2009	3.5	11	10	NM	NM	NM	NM	NM	NS	NS	NS	<3.5	<3.5
		ug/L	11/30/2009	3.5	11	10	NM	NM	NM	NM	NM	NS	NS	NS	<3.5	<3.5
		ug/L	5/20/2010	3.5	11	10	NM	NM	NM	NM	NM	NS	NS	NS	<3.5	<3.5
		ug/L	11/19/2010	3.5	11	10	NM	NM	NM	NM	NM	NS	NS	NS	<3.5	<3.5
		ug/L	5/19/2011	3.5	11	10	NM	NM	NM	NM	NM	NS	NS	NS	<3.5	<3.5
		Cyanide - (NC 2L = 70 ug/L) SWD # = 58	ug/L	12/2/1996	--	--	2	NM	NM	NM	NM	NM	NS	NS	NS	NS
	ug/L		5/7/1995	--	--	2	NM	NM	NM	NM	NM	NS	NS	NS	NS	NS
	ug/L		3/13/1995	--	--	2	NM	NM	NM	NM	NM	NS	NS	NS	NS	NS
	ug/L		11/11/1995	--	--	2	NM	NM	NM	NM	NM	NS	NS	NS	NS	NS
	ug/L		6/10/1996	--	--	2	NM	NM	NM	NM	NM	NS	NS	NS	NS	NS
	ug/L		11/22/1996	--	--	2	NM	NM	NM	NM	NM	NS	NS	NS	NS	NS
	ug/L		3/18/1997	--	--	2	NM	NM	NM	NM	NM	NS	NS	NS	NS	NS
	ug/L		10/21/1997	--	--	2	NM	NM	NM	NM	NM	NS	NS	NS	NS	NS
ug/L	5/26/1998		--	--	2	NM	NM	NM	NM	NM	NS	NS	NS	NS	NS	
ug/L	12/1/1998		--	--	2	NM	NM	NM	NM	NM	NS	NS	NS	NS	NS	
ug/L	6/7/1999		--	--	2	NM	2	NM	--	--	--	--	--	--	--	
ug/L	9/8/1999		--	--	2	NM	--	NM	--	--	ND	--	--	--	--	
ug/L	12/15/1999		--	--	2	NM	ND	NM	ND	ND	--	ND	--	--	--	
ug/L	6/6/2000		--	--	2	NM	ND	NM	ND	ND	--	ND	--	--	--	
ug/L	12/27/2000		--	--	2	NM	ND	NM	ND	ND	--	ND	--	--	--	
ug/L	6/4/2001		--	--	2	NM	ND	NM	ND	ND	--	ND	--	--	--	
ug/L	12/1/2001		--	--	2	NM	ND	NM	ND	ND	--	ND	--	--	--	
ug/L	6/10/2002		--	--	2	NM	ND	NM	ND	ND	--	ND	--	--	--	
ug/L	12/16/2002		--	--	2	NM	ND	NM	ND	ND	--	ND	--	--	--	
ug/L	6/9/2003		--	--	2	NM	ND	NM	ND	ND	--	ND	--	--	--	
ug/L	12/8/2003		--	--	2	NM	ND	NM	ND	ND	--	ND	--	--	--	
ug/L	6/29/2004		--	--	2	NM	ND	NM	ND	ND	--	ND	--	--	--	
ug/L	9/19/2004		--	--	2	NM	ND	NM	ND	ND	--	ND	--	--	--	
ug/L	12/20/2004		--	--	2	NM	ND	NM	ND	ND	--	ND	--	--	--	
ug/L	6/5/2005		--	--	2	NM	ND	NM	ND	ND	--	ND	--	--	--	
ug/L	12/5/2006		1.6	--	2	NM	4.1	NM	3	5.4	3.8	3.7	--	--	--	
ug/L	6/5/2006		--	--	2	NM	19.7	NM	13.7	2.5	ND	2.2	--	--	--	
ug/L	12/5/2006		--	--	2	NM	4.6	NM	5.1	2.1	4.6	--	--	--	--	
ug/L	5/30/2007		5.8	10	10000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
ug/L	11/19/2007		1.2	5	10	NM	NM	NM	NM	NM	NS	NS	NS	NS	NS	
ug/L	5/19/2008		1.2	5	10	NM	<1.2	2.5	<1.2	1.1	<1.2	<1.2	<1.2	<1.2	<1.2	
ug/L	11/19/2008		1.3	5	10	NM	<1.3	1.3	<1.3	1.3	<1.3	<1.3	<1.3	<1.3	<1.3	
ug/L	6/30/2009		1.3	5	10	NM	NM	NM	NM	NM	NS	NS	NS	NS	NS	
ug/L	11/30/2009		1.3	5	10	NM	NM									

Table 5  
Summary of Historically Detected Constituents in Groundwater  
City of Durham Closed Municipal Solid Waste Landfill  
S&ME Project No. 1054-07-469  
Permit No. 32-01

Detected Monitoring Constituents/Analytes	Units	Sample Date	Detection Limit	Quantitation Limit	Solid Waste Section Limits	Background Well MW-9R	MW-2	MW-3R	MW-4R	MW-5	MW-7R	MW-8	MW-10	Equipment Blank	Trip Blank	
Sulfide - (No NC 2L Std.) SWID # - 187	ug/L	12/2/1994	--	--	--	NM	--	NM	--	--	--	--	--	--	--	
	ug/L	2/7/1995	--	--	--	NM	--	NM	--	--	--	--	--	--	--	
	ug/L	3/11/1995	--	--	--	NM	--	NM	--	--	--	--	--	--	--	
	ug/L	11/4/1995	--	--	--	NM	--	NM	--	--	--	--	--	--	--	
	ug/L	6/9/1996	--	--	--	NM	--	NM	--	--	--	--	--	--	--	
	ug/L	11/17/1996	--	--	--	NM	--	NM	--	--	--	--	--	--	--	
	ug/L	3/18/1997	--	--	--	NM	--	NM	--	--	--	--	--	--	--	
	ug/L	10/2/1997	--	--	--	NM	--	NM	--	--	--	--	--	--	--	
	ug/L	5/29/1998	--	--	--	NM	--	NM	--	--	--	--	--	--	--	
	ug/L	12/1/1998	--	--	--	NM	ND	NM	--	--	--	--	200	--	--	
	ug/L	6/7/1999	--	--	--	NM	--	NM	--	--	--	--	--	--	--	
	ug/L	7/8/1999	--	--	--	NM	--	NM	--	--	--	--	--	--	--	
	ug/L	12/15/1999	--	--	--	NM	600	NM	600	400	200	200	200	--	--	
	ug/L	6/6/2000	--	--	100	NM	100	NM	600	500	100	100	100	--	--	
	ug/L	12/27/2000	--	--	--	NM	300	NM	500	520	200	260	200	--	--	
	ug/L	6/4/2001	--	--	--	NM	600	NM	600	200	200	200	200	--	--	
	ug/L	12/5/2001	--	--	400	NM	ND	NM	ND	ND	ND	ND	ND	--	--	
	ug/L	6/10/2002	--	--	200	NM	ND	NM	ND	ND	ND	ND	ND	--	--	
	ug/L	12/16/2002	--	--	200	NM	300	NM	ND	ND	ND	ND	ND	--	--	
	ug/L	6/9/2003	--	--	200	NM	ND	NM	ND	ND	ND	ND	ND	--	--	
	ug/L	12/8/2003	--	--	2000	NM	ND	NM	12000	ND	ND	ND	ND	--	--	
	ug/L	6/26/2004	--	--	2000	NM	ND	NM	ND	ND	ND	ND	ND	--	--	
	ug/L	9/18/2004	--	--	--	NM	ND	NM	--	--	ND	ND	ND	--	--	
	ug/L	12/29/2004	--	--	--	NM	ND	NM	--	--	ND	ND	ND	--	--	
	ug/L	6/5/2005	--	--	2000	NM	ND	NM	12000	ND	14000	15000	15000	--	--	
	ug/L	12/5/2005	94	--	2000	NM	ND	NM	ND	ND	ND	ND	ND	--	--	
	ug/L	6/5/2006	--	--	2000	NM	ND	NM	11000	ND	ND	ND	ND	--	--	
	ug/L	12/5/2006	--	--	--	NM	16000	NM	12000	14000	15000	12000	12000	--	--	
	ug/L	5/8/2007	500	--	1000	NM	ND	NM	ND	ND	ND	ND	ND	ND	ND	
	ug/L	11/19/2007	16	50	1000	NM	50	NM	NM	NM						
	ug/L	5/19/2008	16	50	1000	27	-16.0	16	-16.0	21	27	-16.0	16	-16.0	NM	
	ug/L	11/19/2008	1.4	50	1000	5.4	NM	NM	NM							
	ug/L	6/25/2009	1.4	50	1000	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	ug/L	11/20/2009	1.4	50	1000	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	ug/L	5/20/2010	1.4	50	1000	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	ug/L	11/19/2010	1.4	50	1000	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	ug/L	5/19/2011	3.4	50	1000	NM	NM	NM	NM	NM	NS	NS	NS	NM	NM	
	Ph (nickel) SWID # - 320	ug/L	5/29/1998	--	--	--	NM	6	NM	7.2	7.2	7.2	7.2	7.2	NM	NM
		ug/L	12/1/1998	--	--	--	NM	5	NM	--	6.3	6.3	6.3	6.3	NM	NM
		ug/L	6/7/1999	--	--	--	NM	--	NM	--	5.98	5.98	5.98	5.98	NM	NM
ug/L		7/8/1999	--	--	--	NM	6.19	NM	7.29	6.8	6.8	6.8	6.8	NM	NM	
ug/L		12/15/1999	--	--	--	NM	5.37	NM	6.96	5.96	5.96	5.96	5.96	NM	NM	
ug/L		6/6/2000	--	--	--	NM	5.18	NM	7.15	6.38	6.38	6.38	6.38	NM	NM	
ug/L		12/11/2000	--	--	--	NM	5.82	NM	7.14	7.36	6.36	6.36	6.36	NM	NM	
ug/L		6/4/2001	--	--	--	NM	5.65	NM	7.02	7.27	6.6	6.6	6.6	NM	NM	
ug/L		12/5/2001	--	--	--	NM	5.45	NM	7.06	7.18	6.4	6.4	6.4	NM	NM	
ug/L		6/10/2002	--	--	--	NM	5.81	NM	6.74	6.07	6.51	6.51	6.51	NM	NM	
ug/L		12/10/2002	--	--	--	NM	5.67	NM	7.22	7.6	6.24	6.24	6.24	NM	NM	
ug/L		6/9/2003	--	--	--	NM	5.44	NM	7.23	7.06	6.86	6.86	6.86	NM	NM	
ug/L		12/9/2003	--	--	--	NM	5.9	NM	7.67	7.67	7.07	7.07	7.07	NM	NM	
ug/L		6/26/2004	--	--	--	NM	5.78	NM	6.96	7.3	7.41	7.41	7.41	NM	NM	
ug/L		12/20/2004	--	--	--	NM	7.39	NM	7.52	7.68	7.85	7.85	7.85	NM	NM	
ug/L		6/8/2005	--	--	--	NM	5.68	NM	6.94	7.79	7.79	7.79	7.79	NM	NM	
ug/L		12/7/2005	--	--	--	NM	5.76	NM	7.13	6.09	7.74	7.74	7.74	NM	NM	
ug/L		6/5/2006	--	--	--	NM	5.93	NM	7.03	7.23	6.76	6.76	6.76	NM	NM	
ug/L		12/8/2006	--	--	--	NM	5.65	NM	7.06	6.69	7.73	7.73	7.73	NM	NM	
ug/L		5/20/2007	--	--	--	NM	6.12	NM	6.07	8.57	8.57	8.57	8.57	NM	NM	
ug/L		11/19/2007	--	--	--	NM	5.27	NM	7.41	6.99	7.3	6.97	6.97	NM	NM	
ug/L		5/19/2008	--	--	--	NM	6.40	6.27	7.11	6.85	6.14	6.14	6.14	NM	NM	
ug/L		11/19/2008	--	--	--	4.82	6.4	6.4	7.05	7.18	7.87	7.87	7.87	5.47	5.47	
ug/L		6/8/2009	--	--	--	4.61	5.76	6.13	6.82	6.94	7.52	7.52	7.52	5.84	5.84	
ug/L		11/20/2009	--	--	--	4.77	5.28	7.06	7.10	7.72	6.94	6.94	6.94	5.69	5.69	
ug/L		5/20/2010	--	--	--	4.75	5.29	6.63	6.69	7.00	7.62	7.62	7.62	5.97	5.97	
ug/L		11/19/2010	--	--	--	4.57	6.64	6.73	6.99	6.67	6.67	6.67	6.67	5.48	5.48	
ug/L		5/19/2011	--	--	--	4.72	5.35	6.83	6.75	NS	NS	NS	NS	5.53	5.53	
Conductivity (field) SWID # - 323		ug/L	5/29/1998	--	--	--	NM	80	NM	--	383	348	348	348	NM	NM
		ug/L	12/1/1998	--	--	--	NM	59	NM	--	388	388	388	388	NM	NM
		ug/L	6/7/1999	--	--	--	NM	95.1	NM	--	467	460	460	460	NM	NM
		ug/L	7/8/1999	--	--	--	NM	--	NM	--	608	--	--	--	NM	NM
		ug/L	12/15/1999	--	--	--	NM	81.4	NM	692	487	456	456	456	NM	NM
		ug/L	6/6/2000	--	--	--	NM	85.8	NM	726	474	479	479	479	NM	NM
		ug/L	12/11/2000	--	--	--	NM	103	NM	465	460	460	460	460	NM	NM
		ug/L	6/4/2001	--	--	--	NM	69.5	NM	539	506	511	511	511	NM	NM
		ug/L	12/1/2001	--	--	--	NM	107	NM	534	437.1	422	422	422	NM	NM
		ug/L	6/10/2002	--	--	--	NM	78	NM	625	444	430	430	430	NM	NM
		ug/L	12/16/2002	--	--	--	NM	84	NM	668	529	242	242	242	NM	NM
		ug/L	6/9/2003	--	--	--	NM	78	NM	652	541	385	385	385	NM	NM
	ug/L	12/8/2003	--	--	--	NM	103	NM	645	401	401	401	401	NM	NM	
	ug/L	6/26/2004	--	--	--	NM	92	NM	630	401	379	379	379	NM	NM	
	ug/L	12/20/2004	--	--	--	NM	97	NM	669	383	440	440	440	NM	NM	
	ug/L	6/8/2005	--	--	--	NM	708	NM	575	467	385	385	385	NM	NM	
	ug/L	12/8/2005	--	--	--	NM	171	NM	708	623	450	450	450	NM	NM	
	ug/L	6/5/2006	--	--	--	NM	66	NM	664	558	348	348	348	NM	NM	
	ug/L	12/5/2006	--	--	--	NM	76	NM	731	369	437	437	437	NM	NM	
	ug/L	5/8/2007	--	--	--	NM	67	NM	720	748	302	302	302	NM	NM	
	ug/L	11/19/2007	--	--	--	NM	163	NM	837	639	431	431	431	NM	NM	
	ug/L	5/19/2008	--	--	50	70	1650	50	730	445	221	221	221	NM	NM	
	ug/L	11/19/2008	--	--	50	114	1144	50	114	446	221	221	221	NM	NM	
	ug/L	6/25/2009	--	--	27	86	1577	27	252	381	525	525	525	NM	NM	
	ug/L	11/20/2009	--	--	45	50	50	45	855	328	244	244	244	NM	NM	
	ug/L	5/20/2010	--	--	51	61	1206	51	852	401	123	123	123	NM	NM	
	ug/L	11/19/2010	--	--	49	167	1055	49	167	809	334	373	373	NM	NM	
	ug/L	5/19/2011	--	--	49	51	920	49	920	637	NS	NS	NS	221	221	

Table 5  
Summary of Historically Detected Constituents in Groundwater  
City of Durham Closed Municipal Solid Waste Landfill  
S&ME Project No. 1054-07-460  
Permit No. 32-01

Detected Monitoring Constituents/Analytes	Units	Sample Date	Detection Limit	Quantitation Limit	Solid Waste Section Limits	Background Well MW-9R	MW-2	MW-3R	MW-4R	MW-5	MW-7R	MW-8	MW-10	Equipment Blank	Trip Blank		
Temperature (field) SWID # = 325	°C	5/26/1998	--	--	--	NM	14.6	NM	--	15.1	--	15.2	--	--	--		
		12/1/1998	--	--	--	NM	16	NM	--	16.5	--	16.8	--	--	--		
		6/7/1999	--	--	--	NM	15.1	NM	--	15.3	--	16.2	--	--	--		
		7/8/1999	--	--	--	NM	--	NM	--	17.3	--	--	--	--	--	--	
		12/13/1999	--	--	--	NM	13.7	NM	--	16.1	--	--	16.3	--	--	--	
		6/6/2000	--	--	--	NM	17.4	NM	--	16.2	15.4	--	16.5	--	--	--	
		12/11/2000	--	--	--	NM	14.3	NM	--	13.6	--	--	16	--	--	--	
		6/4/2001	--	--	--	NM	15.1	NM	--	13.6	--	--	15.7	--	--	--	
		12/5/2001	--	--	--	NM	14.4	NM	--	15.8	19.4	--	15.7	--	--	--	
		4/18/2002	--	--	--	NM	10	NM	--	15.8	--	--	15.2	--	--	--	
		12/18/2002	--	--	--	NM	12.6	NM	--	14.1	15.9	--	14.1	--	--	--	
		6/9/2003	--	--	--	NM	15.6	NM	--	16.4	14.8	--	16.6	--	--	--	
		12/8/2003	--	--	--	NM	14.8	NM	--	14	--	--	14.6	--	--	--	
		6/28/2004	--	--	--	NM	17	NM	--	16.3	15.3	14.4	16.8	--	--	--	
		12/20/2004	--	--	--	NM	12.57	NM	--	13.48	14.59	--	14.62	--	--	--	
		6/8/2005	--	--	--	NM	16.62	NM	--	18.58	15.6	15.08	15.69	--	--	--	
		12/8/2005	--	--	--	NM	14.4	NM	--	13.36	15.05	--	14.51	14.53	--	--	
		6/5/2006	--	--	--	NM	15.44	NM	--	15.18	17.5	15.63	--	--	--	--	
		12/5/2006	--	--	--	NM	14.12	NM	--	14.91	16.21	14.04	14.15	--	--	--	
		5/30/2006	--	--	--	NM	16.10	NM	--	20.39	20.52	17.11	19.31	--	--	--	
		11/19/2007	--	--	--	NM	16.44	NM	--	16.48	18.07	15.13	17.12	--	--	--	
		5/19/2008	--	--	--	NM	16.20	14.41	14.2	14.7	14.46	14.9	14.7	--	--	--	
		11/19/2008	--	--	--	16.00	14.86	15.84	15.45	15.45	17.22	14.84	16.01	--	--	--	
		6/30/2009	--	--	--	16.62	17.52	15.43	17.24	15.96	15.44	16.38	15.90	--	--	--	
		11/30/2009	--	--	--	18.16	15.37	15.28	15.67	17.00	15.10	15.47	15.65	--	--	--	
		5/20/2010	--	--	--	15.18	14.24	14.26	14.51	15.46	14.47	14.45	14.45	--	--	--	
		11/19/2010	--	--	--	18.35	16.18	16.20	16.51	17.69	14.91	16.99	16.39	--	--	--	
		5/19/2011	--	--	--	16.3	14.39	13.87	14.45	14.17	NS	NS	14.42	--	--	--	
		Turbidity (field) SWID # = 330	NTU	5/26/1998	--	--	--	NM	662	NM	--	239	--	239	--	--	--
				12/1/1998	--	--	--	NM	34	NM	--	201	--	14.7	--	--	--
6/7/1999	--			--	--	NM	--	NM	--	125	--	172	--	--	--		
NTU	7/8/1999			--	--	--	NM	--	NM	nrhd	--	--	--	--	--	--	
NTU	12/11/1999			--	--	--	NM	52.6	NM	107	107	127.1	--	--	--	--	
NTU	6/6/2000			--	--	--	NM	5.74	NM	48.2	686	75	--	--	--	--	
NTU	12/11/2000			--	--	--	NM	>200	NM	41.3	>200	161	--	--	--	--	
NTU	6/4/2001			--	--	--	NM	23.6	NM	18	>1000	180	--	--	--	--	
NTU	12/5/2001			--	--	--	NM	14	NM	11	>999	65	--	--	--	--	
NTU	6/10/2002			--	--	--	NM	6.61	NM	20	190	--	--	--	--	--	
NTU	12/16/2002			--	--	--	NM	12	NM	245	130	1000	--	--	--	--	
NTU	6/9/2003			--	--	--	NM	128	NM	45	75	275	--	--	--	--	
NTU	12/9/2003			--	--	--	NM	110	NM	15	--	280	--	--	--	--	
NTU	6/4/2004			--	--	--	NM	--	NM	--	--	--	--	--	--	--	
NTU	12/29/2004			--	--	--	NM	48	NM	3.5	372	32.9	--	--	--	--	
NTU	6/8/2005			--	--	--	NM	5	NM	8.9	611	9.1	--	--	--	--	
NTU	12/7/2005			--	--	--	NM	63	NM	11	>1000	11	--	--	--	--	
NTU	6/5/2006			--	--	--	NM	70.4	NM	5.3	>1000	133	100	--	--	--	
NTU	12/5/2006			--	--	--	NM	15.8	NM	2.8	597	45	25	--	--	--	
NTU	5/30/2007			--	--	--	NM	0	NM	0	0	>1000	61.8	--	--	--	
NTU	11/19/2007			--	--	--	NM	52	NM	9.8	399	251.4	121.4	--	--	--	
NTU	5/19/2008			--	--	--	NM	21.5	60.4	3.1	6.9	8.4	--	--	--	--	
NTU	11/19/2008			--	--	--	NM	11.3	11.4	56.3	3.9	7.4	10.9	124.2	--	--	
NTU	6/30/2009			--	--	--	NM	7.5	9.2	8.9	0	3	98	--	--	--	
NTU	11/30/2009			--	--	--	NM	22.4	13	12	10	22.5	41.5	--	--	--	
NTU	5/20/2010			--	--	--	NM	9.8	9.6	8.8	0.4	9.6	14	19.9	--	--	
NTU	11/19/2010			--	--	--	NM	21	16	10.9	1.2	3.3	16.3	9.5	--	--	
NTU	5/19/2011			--	--	--	NM	18.5	26	8.4	NS	11.7	NS	NS	--	--	
ORP (field) SWID # = 336	mV			5/30/2007	--	--	--	NM	228	NM	95	193	156	--	--	--	--
				11/19/2007	--	--	--	NM	218	NM	82	103	NS	--	--	--	
		5/19/2008	--	--	--	NM	225.1	40	151	49	-75.2	49	--	--			
		11/19/2008	--	--	--	NM	199.3	103.7	-92.4	40.9	-103.7	69.3	-33.8	-8.8	--		
		6/30/2009	--	--	--	NM	246	154	-47.4	43	55	20.8	--	--	--		
		11/30/2009	--	--	--	NM	238	241	-51.8	-107.9	-109	65.3	8.8	--	--		
		5/20/2010	--	--	--	NM	262.5	-23	25.8	48.7	-23.4	89.9	--	--	--		
		11/19/2010	--	--	--	NM	310.2	176	-37.3	12.7	-76.6	-118.4	16.8	49.7	--		
		5/19/2011	--	--	--	NM	194	91	-151	94.4	29.8	NS	-23	--	--		
		Dissolved Oxygen (field) SWID # = 356	mg/L	12/1/2001	--	--	--	NM	4.00	NM	3.90	3.50	--	2.25	--	--	--
				6/10/2002	--	--	--	NM	9.08	NM	7.00	6.85	5.69	--	--	--	--
				12/16/2002	--	--	--	NM	7.92	NM	5.99	6.20	--	3.30	--	--	--
				6/9/2003	--	--	--	NM	9.58	NM	4.63	2.65	--	3.69	--	--	--
				12/5/2003	--	--	--	NM	5.00	NM	7.90	--	--	4.30	--	--	--
				6/24/2004	--	--	--	NM	8.44	NM	5.37	2.96	6.20	6.20	--	--	--
12/20/2004	--			--	--	NM	7.52	NM	3.65	3.61	4.60	4.60	--	--	--		
6/8/2005	--			--	--	NM	--	NM	--	--	--	--	--	--	--	--	
6/5/2006	--			--	--	NM	4.48	NM	4.31	1.48	2.19	2.60	--	--	--		
12/5/2006	--			--	--	NM	7.19	NM	2.83	20.00	2.40	3.91	--	--	--		
5/30/2007	--			--	--	NM	2.60	NM	4.60	3.60	5.60	2.80	--	--	--		
11/19/2007	--			--	--	NM	2.72	NM	1.57	0.24	1.18	0.12	--	--	--		
5/19/2008	--			--	--	NM	NM	NM	NM	NM	NM	NM	--	--	--		
11/19/2008	--			--	--	NM	9.21	3.84	7.62	0.89	3.48	0.87	3.36	--	--		
6/30/2009	--			--	--	NM	8.71	2.4	2.4	6.1	24.6	30	3.3	--	--		
11/30/2009	--			--	--	NM	4.77	8.32	2.84	0.95	0.23	0.31	0.34	--	--		
5/20/2010	--			--	--	NM	0.54	0.12	0.12	0.19	0.26	0.49	--	--	--		
11/19/2010	--			--	--	NM	0.84	3.4	2.67	2.09	1.82	0.48	1.91	--	--		
5/19/2011	--			--	--	NM	1.83	6.48	0.2	0.77	0.09	NS	0.13	--	--		

Notes:  
 µg/L = microgram per liter  
 mg/L = milligram per liter  
 S.U. = Standard Units  
 NTU = Nephelometric Turbidity Units  
 mV = millivolts  
 ND = Not detected at the stated reporting limit  
 ORP = Oxidation Reduction Potential  
 µS/cm = micro Siemens per centimeter  
 -- = no data available  
 Blanks = field, trip and method blanks  
 NM = not measured/analyzed  
 NS = not sampled  
 \* Sample data from 9/94 through 12/98 compiled and reported by Malcolm Pirnie, Inc.  
 \* Sample data from 6/99 through 12/06 collected, compiled and reported by Weston Solutions, Inc.  
 \* Sample data from 5/07 collected, compiled and reported by Golder Associates.  
 \* Sample data from 11/07 thru thru current was collected, compiled and reported by S&ME.  
 \* Laboratory data prior to November 2007 was not validated by S&ME. Solid Waste Section Limits = NCPQL from 9/14/94 through 12/5/06 and NCSWSL for 5/30/07 and later  
 Current NCA/C 2L Standards effective January 1, 2010.  
 GPS = Groundwater protection standard

**Table 6**  
**Summary of Historically Detected Constituents in Surface Water**  
**City of Durham Closed Municipal Solid Waste Landfill**  
**S&ME Project No. 1054-07-469**  
**Permit No. 32-01**

Detected Monitoring Constituents/Analytes	Units	Sample Date	Detection Limit	Quantitation Limit	Solid Waste Section Limits	S-4 (Upstream)	S-1	S-2	S-3
Antimony - (SW Standard 5.6 ug/L) SWID # = 13	ug/L	12/20/2004	--	--	5	ND	ND	ND	ND
		6/5/2005	--	--	5	ND	ND	5	ND
		12/7/2005	--	--	5	ND	ND	ND	ND
		6/5/2006	--	--	5	ND	ND	DRY	ND
		12/5/2006	--	--	5	ND	ND	ND	ND
		5/30/2007	0.58	2	6	ND	DRY	DRY	ND
		11/30/2007	0.22	1	6	0.94	DRY	DRY	0.97
		5/19/2008	0.22	1	6	0.40	<0.22	<0.22	0.24
		11/19/2008	0.22	1	6	1.076	1.059	1.07	1.076
		6/30/2009	0.68	1	6	<0.68	DRY	DRY	<0.68
		11/30/2009	0.073	2	6	0.212 J	<0.073	<0.365 UD	<0.365
		5/20/2010	0.22	2	6	0.881 J	<0.22	<0.22	<0.22
		11/19/2010	0.22	2	6	<0.22	<0.22	<0.22	<0.22
		5/19/2011	0.22	2	6	0.271 J	<0.22	<0.22	<0.22
		Arsenic - (SW Standard = 10 ug/L) SWID # = 14	ug/L	5/30/2007	2	10	10	ND	DRY
11/30/2007	0.15			1	10	1.5	DRY	DRY	1.7
5/19/2008	0.15			1	10	<0.15	<0.15	1.2	<0.15
11/19/2008	0.15			1	10	1.12	1.14	1.12	1.1
6/30/2009	2.8			1	10	<2.8	DRY	DRY	<2.8
11/30/2009	2.8			1	10	<2.8	<2.8	<2.8	<2.8
5/20/2010	2.8			1	10	<2.8	<2.8	<2.8	<2.8
11/19/2010	2.8			1	10	2.94 J	3.35 J	<2.8	<2.8
5/19/2011	2.8			1	10	<2.8	5.0 J	<2.8	<2.8
Barium - (SW Standard = 1000 ug/L) SWID # = 15	ug/L			2/7/1995	--	--	--	27	69
		3/13/1995	--	--	25	51	61	59	ND
		6/10/1996	--	--	25	42	86	75	ND
		11/12/1996	--	--	25	32	37	59	ND
		3/18/1997	--	--	--	44	126	41	27
		10/2/1997	--	--	25	92	162	62	ND
		5/26/1998	--	--	--	35	94	72	106
		12/1/1998	--	--	--	47	DRY	DRY	25
		6/7/1999	--	--	25	ND	DRY	DRY	ND
		12/1/1999	--	--	--	54	174	85	96
		6/6/2000	--	--	--	73	DRY	DRY	DRY
		12/22/2000	--	--	--	66	DRY	DRY	DRY
		6/4/2001	--	--	--	97	ND	ND	80
		12/3/2001	--	--	25	ND	DRY	DRY	ND
		6/10/2002	--	--	25	ND	DRY	DRY	ND
		12/16/2002	--	--	--	76	58	64	29
		6/10/2003	--	--	25	ND	111	93	28
		12/8/2003	--	--	25	14	59	62	ND
		6/29/2004	--	--	25	ND	83	49	ND
		12/20/2004	--	--	25	ND	42	71	ND
		6/5/2005	--	--	25	ND	73	6	28
		12/7/2005	--	--	--	39	59	52	46
		6/5/2006	--	--	25	ND	126	DRY	ND
		12/5/2006	--	--	--	106	28	79	25
		5/30/2007	0.2	10	100	8.1 J	DRY	DRY	7.6 J
11/30/2007	1	5	100	3.2	DRY	DRY	9.1		
5/19/2008	1	5	100	17	64	66	18		
11/19/2008	1	5	100	96.1 J	64.1 J	64.1 J	11.1 J		
6/30/2009	4.2	5	100	9.78 J	DRY	DRY	8.29 J		
11/30/2009	1	10	100	10.5 J	70.1 J	61.4 J	14.1 J		
5/20/2010	1	10	100	19.6 J	64.1 J	76.1 J	19.7 J		
11/19/2010	1	10	100	6.12 J	94.8 J	43.9 J	4.59 J		
5/19/2011	1	10	100	14.3 J	108	65.2	15.5		
Beryllium - (SW Standard = 6.5 ug/L) SWID # = 23	ug/L	11/30/2007	0.24	1	1	0.4	DRY	DRY	0.43
		5/19/2008	0.24	1	1	<0.24	<0.24	<0.24	<0.24
		11/19/2008	0.24	1	1	<1.4	1.035	<1.4	<1.4
		6/30/2009	0.08	1	1	<0.08	DRY	DRY	<0.08
		11/30/2009	1	1	1	<1.0	<1.0	<1.0	<1.0
		5/20/2010	0.1	1	1	<0.1	<0.1	<0.1	<0.1
		11/19/2010	0.1	1	1	<0.1	<0.1	<0.1	<0.1
		5/19/2011	0.1	1	1	<0.1	<0.1	1.35 J	<0.1
Chromium - (SW Standard = 50 ug/L) SWID # = 51	ug/L	2/7/1995	--	--	5	ND	ND	ND	ND
		3/13/1995	--	--	5	ND	ND	ND	ND
		6/10/1996	--	--	5	ND	ND	ND	ND
		11/12/1996	--	--	5	ND	ND	ND	ND
		3/18/1997	--	--	5	ND	ND	ND	ND
		10/2/1997	--	--	5	ND	5.9	ND	ND
		5/26/1998	--	--	5	ND	5	ND	ND
		12/1/1998	--	--	5	ND	DRY	DRY	ND
		6/7/1999	--	--	5	ND	DRY	DRY	ND
		12/1/1999	--	--	--	7	16	8	8
		6/6/2000	--	--	5	ND	DRY	DRY	DRY
		12/22/2000	--	--	5	ND	DRY	DRY	DRY
		6/4/2001	--	--	5	ND	ND	ND	ND
		12/3/2001	--	--	5	ND	DRY	DRY	ND
		6/10/2002	--	--	5	ND	DRY	DRY	ND
		12/16/2002	--	--	5	ND	ND	ND	ND
		6/10/2003	--	--	5	ND	5	ND	ND
		12/8/2003	--	--	5	ND	5	ND	ND
		6/29/2004	--	--	5	ND	ND	ND	ND
		12/20/2004	--	--	5	5	ND	ND	ND
		6/5/2005	--	--	5	ND	ND	ND	5
		12/7/2005	--	--	5	5	ND	ND	9
		6/5/2006	--	--	5	ND	ND	DRY	ND
		12/5/2006	--	--	5	ND	ND	ND	ND
		5/30/2007	2	10	10	ND	DRY	DRY	ND
11/30/2007	2.3	10	10	<2.3	DRY	DRY	<2.3		
5/19/2008	2.3	10	10	<2.3	<2.3	<2.3	<2.3		
11/19/2008	2.3	10	10	<2.0	<2.0	3.0	<2.0		
6/30/2009	0.7	10	10	<0.7	DRY	DRY	1.1 J		
11/30/2009	1	10	10	<1.0	2.64 J	<1.0	<1.0		
5/20/2010	1	10	10	1.18 J	3.03 J	4.65 J	<1.0		
11/19/2010	1	10	10	<1.0	<1.0	<1.0	<1.0		
5/19/2011	1	10	10	<1.0	1.44 J	2.98 J	<1.0		

**Notes:**  
ug/L = micrograms per liter  
mg/L = milligrams per liter  
S.U. = Standard Units  
NTU = Nephelometric Turbidity Units  
mV = millivolts  
ND = Not detected at the stated reporting limit  
ORP = Oxidation Reduction Potential  
µS/cm = microsiemens per centimeter  
-- = no data available  
Blanks = field, trip and method blanks  
NME = not measured/analyzed

Surface Water Standards/SW Standards are WS Standards (Ellebe Creek is a WS-IV Classification) or Freshwater Aquatic Life Standards if no WS Standard exists  
Shaded = Concentrations above the applicable Surface Water Standards have been shaded.  
\* = Standard is an Action Limit  
\* Sample data from 9/94 through 12/98 compiled and reported by Malcolm Pirnie, Inc.  
\* Sample data from 6/99 through 12/06 collected, compiled and reported by Weston Solutions, Inc.  
\* Sample data from 5/07 collected, compiled and reported by Golder Associates.  
\* Sample data from 1/07 to present collected, compiled and reported by S&ME.  
SWS Reporting Limit = NCPQL from 9/14/94 through 12/5/06 and NCSWSL for 5/30/07 and Later.  
\* Laboratory data prior to November 2007 was not validated by S&ME. Solid Waste Section Limits = NCPQL from 9/14/94 through 12/5/06 and NCSWSL for 5/30/07 and later

**Table 6**  
**Summary of Historically Detected Constituents in Surface Water**  
**City of Durham Closed Municipal Solid Waste Landfill**  
**S&ME Project No. 1054-07-469**  
**Permit No. 32-01**

Detected Monitoring Constituents/Analytes	Units	Sample Date	Detection Limit	Quantitation Limit	Solid Waste Section Limits	S-4 (Upstream)	S-1	S-2	S-3
Copper - (SW Standard = 7 ug/L)** SWID # = 54	ug/L	2/7/1995	--	--	5	ND	ND	ND	ND
		3/13/1995	--	--	5	5.5	6.8	8.6	ND
		6/10/1996	--	--	5	6.3	5.9	5.7	ND
		11/12/1996	--	--	5	ND	ND	ND	ND
		3/18/1997	--	--	5	6	ND	ND	6
		10/2/1997	--	--	5	ND	ND	ND	ND
		5/26/1998	--	--	5	6	6	6	9
		12/1/1998	--	--	5	ND	DRY	DRY	ND
		6/7/1999	--	--	5	ND	DRY	DRY	ND
		12/1/1999	--	--	--	10	14	10	11
		6/6/2000	--	--	5	ND	DRY	DRY	DRY
		12/22/2000	--	--	5	ND	DRY	DRY	DRY
		6/4/2001	--	--	5	13	ND	8	ND
		12/3/2001	--	--	5	ND	DRY	DRY	ND
		6/10/2002	--	--	5	ND	DRY	DRY	ND
		12/16/2002	--	--	5	21	8	10	8
		6/10/2003	--	--	5	ND	8	6	ND
		12/8/2003	--	--	5	ND	5	6	ND
		6/29/2004	--	--	5	ND	8	ND	ND
		12/20/2004	--	--	5	ND	ND	ND	ND
		6/5/2005	--	--	--	3	5	5	2
		12/7/2005	--	--	--	9	7	10	11
		6/5/2006	--	--	--	3	9	DRY	3
		12/5/2006	--	--	--	2	3	6	3
		5/30/2007	0.6	10	10	1.3 B	DRY	DRY	0.8 B
		11/30/2007	0.45	1	10	1.3	DRY	DRY	2.1
		5/19/2008	0.45	1	10	4	6	10	3.8
11/19/2008	0.45	1	10	2.7 J	4.3 J	4.7 J	3.3 J		
6/30/2009	0.81	1	10	<0.81	DRY	DRY	<0.81		
11/30/2009	1.6	10	10	<1.6	2.83 J	2.34 J	<1.60		
5/20/2010	1.6	10	10	2.73 J	4.41 J	9.21 J	<1.60		
11/19/2010	1.6	10	10	<1.6	<1.6	<1.6	<1.6		
5/19/2011	1.6	10	10	1.6 J	2.11 J	3.75 J	1.83 J		
Lead - (SW Standard = 25 ug/L) SWID # = 131	ug/L	2/7/1995	--	--	5	11	ND	6.2	ND
		3/13/1995	--	--	5	ND	ND	7.5	ND
		6/10/1996	--	--	5	ND	ND	ND	ND
		11/12/1996	--	--	5	ND	ND	ND	ND
		3/18/1997	--	--	5	5	ND	ND	5
		10/2/1997	--	--	5	ND	ND	ND	ND
		5/26/1998	--	--	5	ND	ND	ND	ND
		12/1/1998	--	--	5	5	DRY	DRY	5
		6/7/1999	--	--	5	ND	DRY	DRY	ND
		12/1/1999	--	--	5	17	5	5	7
		6/6/2000	--	--	5	ND	DRY	DRY	DRY
		12/22/2000	--	--	5	ND	DRY	DRY	DRY
		6/4/2001	--	--	5	ND	9	ND	ND
		12/3/2001	--	--	5	ND	DRY	DRY	ND
		6/10/2002	--	--	5	ND	DRY	DRY	ND
		12/16/2002	--	--	5	ND	ND	ND	ND
		6/10/2003	--	--	5	9	ND	6	ND
		12/8/2003	--	--	5	ND	ND	ND	ND
		6/29/2004	--	--	5	ND	ND	ND	ND
		12/20/2004	--	--	5	ND	ND	ND	ND
		6/5/2005	--	--	5	9	6	6	6
		12/7/2005	--	--	5	10	ND	ND	10
		6/5/2006	--	--	5	ND	ND	DRY	ND
		12/5/2006	--	--	5	ND	ND	ND	ND
		5/30/2007	2	10	10	ND	DRY	DRY	ND
		11/30/2007	2.4	5	5	<2.4	DRY	DRY	<2.4
		5/19/2008	2.4	5	5	<2.4	<2.4	4.1	<2.4
11/19/2008	2.4	5	5	0.5 J	0.79 J	1.7 J	10.45		
6/30/2009	1.6	5	5	2.4 JB	DRY	DRY	<1.6		
11/30/2009	1.9	10	10	<1.90	<1.90	<1.90	<1.90		
5/20/2010	1.9	10	10	<1.90	3.15 J	3.61 J	<1.90		
11/19/2010	1.9	10	10	<1.90	<1.90	<1.90	<1.90		
5/19/2011	1.9	10	10	2.31 J	<1.90	2.90 J	<1.90		
Nickel - (SW Standard = 88 ug/L) SWID # = 152	ug/L	2/7/1995	--	--	10	ND	ND	ND	ND
		3/13/1995	--	--	10	ND	13	16	ND
		6/10/1996	--	--	10	ND	ND	ND	ND
		11/12/1996	--	--	10	ND	ND	ND	ND
		3/18/1997	--	--	10	ND	ND	ND	ND
		10/2/1997	--	--	10	ND	ND	ND	ND
		5/26/1998	--	--	10	ND	ND	ND	ND
		12/1/1998	--	--	10	ND	DRY	DRY	ND
		6/7/1999	--	--	10	ND	DRY	DRY	ND
		12/1/1999	--	--	10	ND	DRY	DRY	ND
		6/6/2000	--	--	10	ND	DRY	DRY	DRY
		12/22/2000	--	--	10	ND	DRY	DRY	DRY
		6/4/2001	--	--	10	ND	ND	ND	ND
		12/3/2001	--	--	10	ND	DRY	DRY	ND
		6/10/2002	--	--	10	ND	DRY	DRY	ND
		12/16/2002	--	--	10	ND	ND	ND	ND
		6/10/2003	--	--	10	ND	ND	ND	ND
		12/8/2003	--	--	10	ND	ND	ND	ND
		6/29/2004	--	--	10	ND	ND	ND	ND
		12/20/2004	--	--	10	ND	ND	ND	ND
		6/5/2005	--	--	10	ND	ND	ND	ND
		12/7/2005	--	--	10	ND	ND	ND	ND
		6/5/2006	--	--	10	ND	ND	ND	ND
		12/5/2006	--	--	10	ND	ND	ND	ND
		5/30/2007	2	10	50	2.7 J	DRY	DRY	2.7 J
		11/30/2007	9.8	20	50	<9.8	DRY	DRY	<9.8
		5/19/2008	9.8	20	50	<9.8	<9.8	<9.8	<9.8
11/19/2008	9.8	20	50	<9.8	<9.8	<9.8	<9.8		
6/30/2009	0.6	10	50	3.1 JB	DRY	DRY	3.8 JB		
11/30/2009	1.8	10	50	<1.8	2.60 J	3.25 J	<1.80		
5/20/2010	1.8	10	50	2.22 J	2.56 J	3.83 J	1.97 J		
11/19/2010	1.8	10	50	<1.80	4.72 J	<1.80	<1.80		
5/19/2011	1.8	10	50	2.11 J	4.4 J	3.14 J	2.05 J		

Notes

ug/L = micrograms per liter  
mg/L = milligrams per liter  
S.U. = Standard Units  
NTU = Nephelometric Turbidity Units  
mV = millivolts  
ND = Not detected at the stated reporting limit  
ORP = Oxidation Reduction Potential  
µS/cm = microsiemens per centimeter  
-- = no data available  
Blanks = field, trip and method blanks  
NM = not measured/analyzed

Surface Water Standards: SW Standards are WS Standards (Ellebe Creek is a WS-IV Classification) or Freshwater Aquatic Life Standards if no WS Standard exists

Shaded = Concentrations above the applicable Surface Water Standards have been shaded.

\*\* Standard is an Action Limit

\* Sample data from 9/94 through 12/98 compiled and reported by Malcolm Pirnie, Inc.

\* Sample data from 6/99 through 12/06 collected, compiled and reported by Weston Solutions, Inc.

\* Sample data from 5/07 collected, compiled and reported by Golder Associates.

\* Sample data from 1/07 to present collected, compiled and reported by S&ME.

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SWS Reporting Limit = NCPQL from 9/14/94 through 12/5/06 and NCSWSL for 5/30/07 and later.

\* Laboratory data prior to November 2007 was not validated by S&ME. Solid Waste Section Limits = NCPQL from 9/14/94 through 12/5/06 and NCSWSL for 5/30/07 and later

**Table 6**  
**Summary of Historically Detected Constituents in Surface Water**  
**City of Durham Closed Municipal Solid Waste Landfill**  
**S&ME Project No. 1054-07-469**  
**Permit No. 32-01**

Detected Monitoring Constituents/Analytes	Units	Sample Date	Detection Limit	Quantitation Limit	Solid Waste Section Limits	S-4 (Upstream)	S-1	S-2	S-3		
Selenium - (SW Standard = 5 ug/L) SWID # = 183	ug/L	5/30/2007	2	10	10	2.9 B	DRY	DRY	2.3 B		
		11/30/2007	0.43	1	10	2.6	DRY	DRY	-0.43		
		5/19/2008	0.43	1	10	-0.43	-0.43	-0.43	-0.43		
		11/19/2008	0.43	1	10	1.2 J	-0.32	0.54 J	0.39 J		
		6/30/2009	3.4	1	10	DRY	DRY	DRY	<3.4		
		11/30/2009	2.7	10	10	<2.7	<2.7	<2.7	<2.7		
		5/20/2010	0.83	10	10	-0.83	-0.83	-0.83	-0.83		
		11/19/2010	0.83	10	10	-0.83	-0.83	-0.83	-0.83		
		5/19/2011	0.83	10	10	1.8 J	1.7 J	1.32 J	1.81 J		
		1.81 J									
Silver - (SW Standard = 0.06 ug/L*) SWID # = 184	ug/L	2/7/1995	--	--	1	ND	ND	ND	ND		
		3/13/1995	--	--	1	ND	ND	ND	ND		
		6/10/1996	--	--	1	ND	1.8	3.3	ND		
		11/12/1996	--	--	1	ND	ND	ND	ND		
		3/18/1997	--	--	1	ND	ND	ND	ND		
		10/2/1997	--	--	1	ND	ND	ND	ND		
		5/26/1998	--	--	1	ND	ND	ND	ND		
		12/1/1998	--	--	1	ND	DRY	DRY	ND		
		6/7/1999	--	--	1	ND	DRY	DRY	ND		
		12/1/1999	--	--	1	ND	DRY	DRY	ND		
		6/6/2000	--	--	1	ND	DRY	DRY	DRY		
		12/22/2000	--	--	1	ND	DRY	DRY	DRY		
		6/4/2001	--	--	1	ND	DRY	DRY	ND		
		12/3/2001	--	--	1	ND	DRY	DRY	ND		
		6/10/2002	--	--	1	ND	DRY	DRY	ND		
		12/16/2002	--	--	1	ND	ND	ND	ND		
		6/10/2003	--	--	1	ND	ND	ND	ND		
		12/8/2003	--	--	1	ND	ND	ND	ND		
		6/29/2004	--	--	1	ND	ND	ND	ND		
		12/20/2004	--	--	1	ND	ND	ND	ND		
		6/5/2005	--	--	1	ND	ND	ND	ND		
		12/7/2005	--	--	1	ND	ND	ND	ND		
		6/5/2006	--	--	1	ND	ND	ND	ND		
		12/5/2006	--	--	1	ND	ND	ND	ND		
		5/30/2007	2	10	10	ND	DRY	DRY	ND		
11/30/2007	2.5	10	10	2.7	DRY	DRY	2.7				
5/19/2008	2.5	10	10	<2.5	<2.5	<2.5	<2.5				
11/19/2008	2.5	10	10	<2.5	<2.5	<2.5	<2.5				
6/30/2009	1	10	10	<1.0	<1.0	<1.0	<1.0				
11/30/2009	1.9	10	10	<1.90	<1.90	<1.90	<1.90				
5/20/2010	1.9	10	10	<1.90	<1.90	<1.90	<1.90				
11/19/2010	1.9	10	10	<1.90	<1.90	<1.90	<1.90				
5/19/2011	1.9	10	10	<1.90	<1.90	<1.90	<1.90				
Thallium - (SW Standard = 0.24 ug/L) SWID # = 194	ug/L	11/30/2007	0.09	1	5.5	0.4	DRY	DRY	0.6		
		5/19/2008	0.09	1	5.5	-0.09	-0.09	-0.09	-0.09		
		11/19/2008	0.09	1	5.5	-0.09	-0.09	-0.09	-0.09		
		6/30/2009	0.036	1	5.5	-0.036	DRY	DRY	<0.036		
		11/30/2009	0.11	1	5.5	-0.11	<0.55 UD	ND	0.685 JD		
		5/20/2010	0.11	1	5.5	-0.11	-0.11	-0.11	-0.11		
		11/19/2010	0.11	1	5.5	-0.11	-0.11	-0.11	-0.11		
		5/19/2011	0.11	1	5.5	-0.11	-0.11	-0.11	-0.11		
		Vanadium - (SW Standard 24 ug/L) SWID # = 209	ug/L	2/7/1995	--	--	5	ND	ND	ND	ND
				3/13/1995	--	--	5	ND	ND	ND	ND
6/10/1996	--			--	5	ND	ND	7.7	ND		
11/12/1996	--			--	5	ND	5	ND	ND		
3/18/1997	--			--	5	ND	ND	ND	ND		
10/2/1997	--			--	5	ND	8.5	ND	5.7		
5/26/1998	--			--	5	ND	5	5	5		
12/1/1998	--			--	5	ND	DRY	DRY	5		
6/7/1999	--			--	5	ND	DRY	DRY	ND		
12/1/1999	--			--	5	11	22	10	11		
6/6/2000	--			--	5	5	DRY	DRY	DRY		
12/22/2000	--			--	5	5	DRY	DRY	DRY		
6/4/2001	--			--	5	ND	ND	5	ND		
12/3/2001	--			--	5	6	DRY	DRY	6		
6/10/2002	--			--	5	6	DRY	DRY	6		
12/16/2002	--			--	5	7	ND	ND	ND		
6/10/2003	--			--	5	ND	7	5	ND		
12/8/2003	--			--	5	ND	ND	ND	ND		
6/29/2004	--			--	5	ND	ND	ND	ND		
12/20/2004	--			--	5	ND	ND	ND	ND		
6/5/2005	--			--	5	5	ND	ND	ND		
12/7/2005	--			--	5	5	7	ND	6		
6/5/2006	--			--	5	ND	ND	DRY	ND		
12/5/2006	--			--	5	ND	ND	ND	ND		
5/30/2007	1			10	25	ND	DRY	DRY	1.2 J		
11/30/2007	2.9	10	25	DRY	DRY	DRY	<2.9				
5/19/2008	2.9	10	25	<2.9	<2.9	3.1	<2.9				
11/19/2008	2.9	10	25	<1.9	<1.9	2.6	<1.9				
6/30/2009	0.7	10	25	2.4 J	DRY	DRY	2.4 J				
11/30/2009	1.4	10	25	1.96 J	1.52 J	1.96 J	2.03 J				
5/20/2010	1.4	10	25	4.02 J	5.14 J	7.89 J	5.27 J				
11/19/2010	1.4	10	25	1.78 J	<1.4	<1.4	1.64 J				
5/19/2011	1.4	10	25	3.9 J	<1.4	5.0 J	2.84 J				
Zinc - (SW Standard = 50 ug/L*) SWID # = 213	ug/L	2/7/1995	--	--	10	33	ND	ND	21		
		3/13/1995	--	--	10	34	63	87	67		
		6/10/1996	--	--	10	ND	ND	ND	13		
		11/12/1996	--	--	10	20	ND	16	22		
		3/18/1997	--	--	10	32	ND	ND	32		
		10/2/1997	--	--	10	10	14	21	146		
		5/26/1998	--	--	10	25	26	19	48		
		12/1/1998	--	--	10	ND	DRY	DRY	56		
		6/7/1999	--	--	10	76	DRY	DRY	42		
		12/1/1999	--	--	10	89	58	45	66		
		6/6/2000	--	--	10	DRY	DRY	DRY	DRY		
		12/22/2000	--	--	10	ND	DRY	DRY	DRY		
		6/4/2001	--	--	10	39	14	16	28		
		12/3/2001	--	--	10	42	DRY	DRY	80		
		6/10/2002	--	--	10	25	DRY	DRY	36		
		12/16/2002	--	--	10	106	18	16	39		
		6/10/2003	--	--	10	18	22	15	19		
		12/8/2003	--	--	10	106	11	ND	42		
		6/29/2004	--	--	10	21	ND	ND	19		
		12/20/2004	--	--	10	31	ND	ND	30		
		6/5/2005	--	--	10	33	ND	ND	30		
		12/7/2005	--	--	10	38	10	16	33		
		6/5/2006	--	--	10	21	17	DRY	17		
		12/5/2006	--	--	10	38	ND	11	41		
		5/30/2007	1	10	10	51.9	DRY	DRY	52.5		
11/30/2007	3	10	10	73	DRY	DRY	62				
5/19/2008	3	10	10	48	10	38	47				
11/19/2008	3	10	10	29	12	12	26				
6/30/2009	3.4	10	10	24.7	DRY	DRY	28.3				
11/30/2009	3.8	10	10	44.6	8.39 J	8.54 J	39.2				
5/20/2010	3.8	10	10	26.6	9.7 J	18.5	29.7				
11/19/2010	3.8	10	10	39.5	9.74 J	4.01 J	40.3				
5/19/2011	3.8	10	10	37.1	4.56 J	10.1	36.8				

**Notes:**  
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SWS Reporting Limit = NCPQL from 9/14/94 through 12/5/06 and NCSWSL for 5/30/07 and later.  
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**Table 6**  
**Summary of Historically Detected Constituents in Surface Water**  
**City of Durham Closed Municipal Solid Waste Landfill**  
**S&ME Project No. 1054-07-469**  
**Permit No. 32-01**

Detected Monitoring Constituents/Analytes	Units	Sample Date	Detection Limit	Quantitation Limit	Solid Waste Section Limits	S-4 (Upstream)	S-1	S-2	S-3		
Cis-1,2 Dichloroethane (SW Standard = 330 ug/L) SWID # = 213	ug/L	11/19/2008	0.36	1	5	-0.36	-0.36	-0.36	-0.36		
		6/30/2009	0.36	1	5	-0.36	-0.36	-0.36	-0.36		
		11/30/2009	0.36	1	5	-0.36	-0.36	0.68 J	-0.36		
		5/20/2010	0.075	1	5	-0.075	-0.075	-0.075	-0.075		
		11/19/2010	0.075	1	5	-0.075	-0.075	-0.075	-0.075		
		5/19/2011	0.72	1	5	-0.72	-0.72	-0.72	-0.72		
Acetone - (SW Standard 2000 ug/L) SWID # = 3	ug/L	5/30/2007	0.9	5	100	ND	DRY	DRY	5.4 B		
		11/30/2007	8.9	50	100	<8.9	DRY	DRY	<8.9		
		5/19/2008	8.9	50	100	<8.9	<8.9	<8.9	<8.9		
		11/19/2008	8.9	50	100	<8.9	<8.9	<8.9	<8.9		
		6/30/2009	1.5	5	100	<1.5	DRY	DRY	<1.5		
		11/30/2009	1.5	5	100	<1.5	<1.5	<1.5	<1.5		
		5/20/2010	1.5	5	100	<1.5	<1.5	<1.5	<1.5		
		11/19/2010	1.5	5	100	<1.5	2.0 J	2.5 J	<1.5		
		5/19/2011	1.2	5	100	<1.2	<1.2	<1.2	<1.2		
		5/19/2011	1.2	5	100	<1.2	<1.2	<1.2	<1.2		
Chloroform - (SW Standard 5.7 ug/L) SWID # = 16	ug/L	9/19/1994	--	--	--	ND	DRY	DRY	ND		
		2/7/1995	--	--	5	ND	ND	ND	ND		
		3/13/1995	--	--	5	ND	ND	ND	ND		
		6/10/1996	--	--	1	ND	ND	ND	ND		
		11/12/1996	--	--	1	ND	ND	ND	ND		
		3/18/1997	--	--	1	ND	ND	ND	ND		
		10/2/1997	--	--	1	ND	ND	ND	ND		
		5/26/1998	--	--	5	ND	DRY	DRY	ND		
		12/1/1998	--	--	2	ND	ND	ND	ND		
		6/7/1999	--	--	5	ND	DRY	DRY	DRY		
		12/1/1999	--	--	5	DRY	DRY	DRY	DRY		
		6/6/2000	--	--	5	ND	ND	ND	ND		
		12/22/2000	--	--	5	ND	DRY	DRY	ND		
		6/4/2001	--	--	5	ND	DRY	DRY	ND		
		12/3/2001	--	--	5	ND	ND	ND	ND		
		6/10/2002	--	--	5	ND	ND	ND	ND		
		12/16/2002	--	--	5	ND	ND	ND	ND		
		6/10/2003	--	--	5	ND	ND	ND	ND		
		12/8/2003	--	--	5	ND	ND	ND	ND		
		6/29/2004	--	--	5	ND	ND	ND	ND		
		12/20/2004	--	--	1	ND	ND	ND	ND		
		6/5/2005	--	--	1	ND	ND	ND	ND		
		12/7/2005	0.35	--	1	ND	ND	ND	ND		
		6/5/2006	--	--	1	0.65 J	ND	ND	0.59 J		
		12/5/2006	--	--	1	ND	ND	ND	ND		
		5/30/2007	0.16	1	5	0.60 J	DRY	DRY	0.55 J		
		11/30/2007	0.33	5	5	0.6	DRY	DRY	0.42		
		5/19/2008	0.33	5	5	0.66	<0.33	<0.33	0.58		
		11/19/2008	0.33	5	5	0.59	<0.33	<0.33	0.42		
		6/30/2009	0.20	1	5	-0.20	DRY	DRY	-0.20		
		11/30/2009	0.20	1	5	0.52 J	-0.20	-0.20	-0.20		
		5/20/2010	0.083	1	5	<-0.083	<-0.083	<-0.083	<-0.083		
		11/19/2010	0.083	1	5	<-0.083	<-0.083	<-0.083	<-0.083		
		5/19/2011	0.700	1	5	-0.70	-0.70	-0.70	-0.70		
		Methylene Chloride - (SW Standard 5 ug/L) SWID # = 140	ug/L	9/19/1994	--	--	--	ND	DRY	DRY	9.5
				2/7/1995	--	--	5	ND	ND	ND	ND
3/13/1995	--			--	5	ND	ND	ND	ND		
6/10/1996	--			--	5	ND	ND	ND	ND		
11/12/1996	--			--	5	ND	ND	ND	ND		
3/18/1997	--			--	5	ND	ND	ND	ND		
10/2/1997	--			--	5	10	ND	ND	ND		
5/26/1998	--			--	5	ND	ND	ND	ND		
12/1/1998	--			--	5	ND	ND	ND	ND		
6/1/1999	--			--	5	ND	DRY	DRY	ND		
12/15/1999	--			--	5	ND	ND	ND	ND		
6/6/2000	--			--	5	ND	DRY	DRY	DRY		
12/22/2000	--			--	5	ND	DRY	DRY	DRY		
6/4/2001	--			--	5	ND	ND	ND	ND		
12/3/2001	--			--	5	ND	DRY	DRY	ND		
6/10/2002	--			--	5	ND	DRY	DRY	ND		
12/16/2002	--			--	5	ND	ND	ND	ND		
6/9/2003	--			--	5	ND	ND	ND	ND		
12/8/2003	--			--	5	ND	ND	ND	ND		
6/28/2004	--			--	5	ND	ND	ND	ND		
12/20/2004	--			--	2	ND	ND	ND	ND		
6/5/2005	--			--	2	ND	ND	ND	ND		
12/7/2005	0.61			--	2	ND	ND	ND	ND		
6/5/2006	--			--	2	ND	ND	ND	ND		
12/5/2006	--			--	2	ND	ND	ND	ND		
5/30/2007	0.088			1	1	ND	DRY	DRY	ND		
11/30/2007	0.3			5	1	-0.30	DRY	DRY	<0.30		
5/19/2008	0.3			5	1	-0.30	-0.30	-0.30	<0.30		
11/19/2008	0.3			5	1	-0.30	-0.30	-0.30	<0.30		
6/30/2009	0.53			1	1	-0.53	DRY	DRY	<0.53		
11/30/2009	0.53			1	1	-0.53	-0.53	-0.53	<0.53		
5/20/2010	0.07			1	1	-0.07	-0.07	-0.07	<0.07		
11/19/2010	0.07			1	1	-0.07	-0.07	-0.07	<0.07		
5/19/2011	0.14			1	1	-0.14	-0.14	-0.14	<0.14		

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Surface Water Standards: SW Standards are WS Standards (Elber Creek is a WS-IV Classification) or Freshwater Aquatic Life Standards if no WS Standard exists  
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\* Sample data from 11/07 thru current was collected, compiled and reported by S&ME.  
SWS Reporting Limit = NCPQL from 9/14/94 through 12/5/06 and NCSWSL for 5/30/07 and Later.  
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Detected Monitoring Constituents/Analytes	Units	Sample Date	Detection Limit	Quantitation Limit	Solid Waste Section Limits	S-4 (Upstream)	S-1	S-2	S-3		
Toluene - (SW Standard = 11 ug/L) SWID # = 196	ug/L	9/19/1994	--	--	--	ND	ND	ND	ND		
		2/7/1995	--	--	5	ND	ND	ND	ND		
		3/13/1995	--	--	5	1.0 B	ND	ND	1.1 B		
		6/10/1996	--	--	1	ND	1.1 B	1.4 B	1.1 B		
		11/12/1996	--	--	1	ND	1	ND	1.7		
		3/18/1997	--	--	1	ND	ND	ND	ND		
		10/2/1997	--	--	1	ND	ND	ND	ND		
		5/26/1998	--	--	1	ND	ND	ND	ND		
		12/1/1998	--	--	1	ND	ND	ND	ND		
		6/7/1999	--	--	5	ND	DRY	DRY	ND		
		12/15/1999	--	--	5	ND	ND	ND	ND		
		4/6/2000	--	--	5	ND	ND	ND	ND		
		12/22/2000	--	--	5	ND	DRY	DRY	DRY		
		6/4/2001	--	--	5	ND	DRY	DRY	DRY		
		12/3/2001	--	--	5	ND	ND	ND	ND		
		6/10/2002	--	--	5	ND	DRY	DRY	DRY		
		12/16/2002	--	--	5	ND	DRY	DRY	ND		
		4/9/2003	--	--	5	ND	ND	ND	ND		
		12/8/2003	--	--	5	ND	ND	ND	ND		
		6/28/2004	--	--	5	ND	ND	ND	ND		
		12/20/2004	--	--	1	ND	ND	ND	ND		
		6/5/2005	--	--	--	ND	ND	ND	ND		
		12/7/2005	0.39	--	1	ND	ND	ND	ND		
		6/5/2006	--	--	1	ND	ND	ND	ND		
		12/5/2006	--	--	1	ND	ND	ND	ND		
		5/30/2007	0.15	1	1	DRY	DRY	DRY	DRY		
		11/30/2007	0.27	5	1	<.27	DRY	DRY	<.27		
		5/19/2008	0.27	5	1	<.27	<.27	<.27	<.27		
		11/19/2008	0.27	5	1	<.27	<.27	<.27	<.27		
		6/30/2009	0.27	1	1	<.27	DRY	DRY	<.27		
11/30/2009	0.27	1	1	<.27	<.27	<.27	<.27				
5/20/2010	0.053	1	1	<.053	<.053	<.053	<.053				
11/19/2010	0.053	1	1	<.053	<.053	<.053	<.053				
5/19/2011	0.85	1	1	<.85	<.85	<.85	<.85				
Cyanide - (SW Standard = 5 ug/L) SWID # = 58	ug/L	12/1/1998	--	--	10	ND	DRY	DRY	ND		
		6/7/1999	--	--	2	2	DRY	DRY	ND		
		12/1/1999	--	--	--	--	2	2	2		
		6/6/2000	--	--	2	ND	DRY	DRY	DRY		
		12/22/2000	--	--	2	ND	DRY	DRY	DRY		
		6/4/2001	--	--	2	ND	ND	ND	ND		
		12/3/2001	--	--	2	ND	DRY	DRY	ND		
		6/10/2002	--	--	2	3	DRY	DRY	ND		
		12/16/2002	--	--	2	2	ND	ND	ND		
		6/10/2003	--	--	2	ND	ND	ND	ND		
		12/8/2003	--	--	2	ND	ND	ND	ND		
		6/29/2004	--	--	2	ND	ND	ND	ND		
		12/20/2004	--	--	2	6.1	ND	ND	4.8		
		6/5/2005	--	--	2	ND	ND	ND	ND		
		12/7/2005	--	--	2	ND	4.9	4.9	5.4		
		6/5/2006	--	--	--	3.1	2.2	DRY	3.1		
		12/5/2006	--	--	--	4.8	2.9	DRY	6.9		
		5/30/2007	--	--	--	--	--	--	--		
		11/30/2007	--	--	10	--	--	--	--		
		5/19/2008	--	--	10	NM	NM	NM	NM		
11/19/2008	--	--	10	NM	NM	NM	NM				
6/30/2009	--	--	10	NM	DRY	DRY	NM				
11/30/2009	--	--	10	NM	NM	NM	NM				
5/20/2010	--	--	10	NM	NM	NM	NM				
11/19/2010	--	--	10	NM	NM	NM	NM				
5/19/2011	--	--	10	NM	NM	NM	NM				
Fluoride - (SW Standard = 1800 ug/L) SWID # = 312	ug/L	11/30/2007	32	100	2000	ND	DRY	DRY	NM		
		5/19/2008	32	100	2000	320	97	110	290		
		11/19/2008	32	100	2000	J 450	J 73	J 84	J 460		
		6/30/2009	--	--	2000	NM	DRY	DRY	NM		
		11/30/2009	--	--	2000	NM	NM	NM	NM		
		5/20/2010	--	--	2000	NM	NM	NM	NM		
		11/19/2010	--	--	2000	NM	NM	NM	NM		
		5/19/2011	--	--	2000	NM	NM	NM	NM		
		Sulfide - (SW Standard 2.0 ug/L) SWID # = 187	ug/L	12/1/1998	--	--	1000	ND	DRY	DRY	ND
				6/7/1999	--	--	200	600	DRY	DRY	ND
12/1/1999	--			--	--	--	--	--	--		
6/6/2000	--			--	--	500	DRY	DRY	DRY		
12/22/2000	--			--	--	760	DRY	DRY	DRY		
6/4/2001	--			--	--	800	400	400	800		
12/3/2001	--			--	200	ND	DRY	DRY	300		
6/10/2002	--			--	200	ND	DRY	DRY	ND		
12/16/2002	--			--	200	300	600	ND	400		
6/10/2003	--			--	200	2600	800	ND	ND		
12/8/2003	--			--	2000	ND	ND	ND	3700		
6/29/2004	--			--	2000	ND	ND	ND	ND		
12/20/2004	--			--	2000	ND	ND	ND	ND		
6/5/2005	--			--	--	2500	15000	16000	15000		
12/7/2005	--			--	2000	ND	ND	ND	ND		
6/5/2006	--			--	2000	ND	120 J	DRY	ND		
12/5/2006	--			--	--	16000	--	16000	15000		
5/30/2007	--			--	--	--	--	--	--		
11/30/2007	--			--	1000	NM	NM	NM	NM		
5/19/2008	--			--	1000	NM	NM	NM	NM		
11/19/2008	--	--	1000	NM	NM	NM	NM				
6/30/2009	--	--	1000	NM	DRY	DRY	NM				
11/30/2009	--	--	1000	NM	NM	NM	NM				
5/20/2010	--	--	1000	NM	NM	NM	NM				
11/19/2010	--	--	1000	NM	NM	NM	NM				
5/19/2011	--	--	1000	NM	NM	NM	NM				

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NTU = Nephelometric Turbidity Units  
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ND = Not detected at the stated reporting limit  
ORP = Oxidation Reduction Potential  
µS/cm = microsiemens per centimeter  
-- = no data available  
Blanks = field, trip and method blanks  
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**Table 6**  
**Summary of Historically Detected Constituents in Surface Water**  
**City of Durham Closed Municipal Solid Waste Landfill**  
**S&ME Project No. 1054-07-469**  
**Permit No. 32-01**

Detected Monitoring Constituents/Analytes	Units	Sample Date	Detection Limit	Quantitation Limit	Solid Waste Section Limits	S-4 (Upstream)	S-1	S-2	S-3
Ph (field) SWID # = 320	S.U.	5/26/1998	--	--	--	--	--	--	--
		12/1/1998	--	--	--	--	--	--	--
		6/7/1999	--	--	--	6	DRY	DRY	5.76
		7/8/1999	--	--	--	6.47	DRY	DRY	6.58
		12/13/1999	--	--	--	6.47	DRY	DRY	6.58
		6/6/2000	--	--	--	6.54	DRY	DRY	DRY
		12/11/2000	--	--	--	7.48	DRY	DRY	DRY
		6/4/2001	--	--	--	7.08	6.92	6.98	7.11
		12/3/2001	--	--	--	6.59	DRY	DRY	5.99
		6/10/2002	--	--	--	7.81	DRY	DRY	8.13
		12/16/2002	--	--	--	7.28	7.66	6.81	7.2
		6/9/2003	--	--	--	7.14	7.58	--	7.49
		12/9/2003	--	--	--	8.46	7.82	8.58	8.46
		6/24/2004	--	--	--	7.53	6.91	7.4	7.57
		12/20/2004	--	--	--	7.64	8.80	--	7.66
		6/8/2005	--	--	--	7.5	7.69	7.31	7.59
		12/7/2005	--	--	--	7.2	7.3	7.14	7.47
		6/5/2006	--	--	--	7.58	7.24	DRY	7.49
		12/5/2006	--	--	--	7.59	7.63	8.54	15.2
		5/31/2007	--	--	--	8.55	DRY	DRY	8.64
11/30/2007	--	--	--	NM	DRY	DRY	NM		
5/19/2008	--	--	--	8.26	8.25	8.35	8.3		
11/19/2008	--	--	--	7.51	7.36	7.53	7.18		
6/30/2009	--	--	--	7.21	DRY	DRY	7.36		
11/30/2009	--	--	--	8.21	7.80	7.75	8.30		
5/20/2010	--	--	--	7.61	7.83	6.67	7.73		
11/19/2010	--	--	--	NM	7.44	7.71	7.75		
5/19/2011	--	--	--	7.67	7.50	6.27	7.86		
Conductivity (field) SWID # = 323	µs/cm	5/26/1998	--	--	--	--	--	--	--
		12/1/1998	--	--	--	--	--	--	--
		6/7/1999	--	--	--	198	DRY	DRY	167
		7/8/1999	--	--	--	257.4	DRY	DRY	134.5
		12/13/1999	--	--	--	272.8	DRY	DRY	137.8
		6/6/2000	--	--	--	202.3	DRY	DRY	DRY
		12/11/2000	--	--	--	277.5	DRY	DRY	DRY
		6/4/2001	--	--	--	372.6	184.8	166.9	393.4
		12/3/2001	--	--	--	445	DRY	DRY	433.5
		6/10/2002	--	--	--	451	DRY	DRY	250
		12/16/2002	--	--	--	123	60	110	341
		6/9/2003	--	--	--	186	177	--	316
		12/8/2003	--	--	--	411.1	29.9	24.3	410
		6/28/2004	--	--	--	451	284	277	431
		12/20/2004	--	--	--	434	249	--	424
		6/8/2005	--	--	--	336	197.1	190.5	345.8
		12/8/2005	--	--	--	250	129	140	176
		6/5/2006	--	--	--	391	161	DRY	412
		12/5/2006	--	--	--	392	194	232	391
		5/31/2007	--	--	--	477	DRY	DRY	485
11/30/2007	--	--	--	NM	DRY	DRY	NM		
5/19/2008	--	--	--	120	120	300	320		
11/19/2008	--	--	--	370	160	380	380		
6/30/2009	--	--	--	330	DRY	DRY	310		
11/30/2009	--	--	--	400	190	200	400		
5/20/2010	--	--	--	287	99	159	267		
11/19/2010	--	--	--	NM	226	473	469		
5/19/2011	--	--	--	313	163	137	311		
Temperature (field) SWID # = 325	°C	5/26/1998	--	--	--	--	--	--	--
		12/1/1998	--	--	--	--	--	--	--
		6/7/1999	--	--	--	17.2	DRY	DRY	18
		7/8/1999	--	--	--	18.1	DRY	DRY	19.2
		12/13/1999	--	--	--	18.1	20.1	17.8	19.2
		6/6/2000	--	--	--	17.7	DRY	DRY	DRY
		12/11/2000	--	--	--	8.9	DRY	DRY	DRY
		6/4/2001	--	--	--	22.3	18.7	20.2	22.5
		12/3/2001	--	--	--	19.5	DRY	DRY	16.2
		6/10/2002	--	--	--	23.49	DRY	DRY	23.43
		12/16/2002	--	--	--	11.19	3.52	4.3	10.53
		6/9/2003	--	--	--	23.36	23.23	--	23.08
		12/8/2003	--	--	--	13.3	6.6	7.8	13.2
		6/28/2004	--	--	--	22.92	21.22	23.4	22.84
		12/20/2004	--	--	--	12.07	1.95	--	9.37
		6/8/2005	--	--	--	23.06	20.83	21.45	22.9
		12/8/2005	--	--	--	12.26	9.29	8.98	10.33
		6/5/2006	--	--	--	21.8	20.12	DRY	21.75
		12/5/2006	--	--	--	15.02	8.32	8	15.2
		5/31/2007	--	--	--	24.28	DRY	DRY	23.8
11/30/2007	--	--	--	NM	DRY	DRY	NM		
5/19/2008	--	--	--	19.0	19.0	22.6	21.7		
11/19/2008	--	--	--	14.7	7.5	6.0	14.6		
6/30/2009	--	--	--	20.4	DRY	DRY	20.3		
11/30/2009	--	--	--	18.4	17.3	17.6	18.6		
5/20/2010	--	--	--	23.04	18.36	20.8	22.38		
11/19/2010	--	--	--	NM	7.69	19.34	19.43		
5/19/2011	--	--	--	21.01	15.61	18.00	21.49		

**Notes:**

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 ORP = Oxidation Reduction Potential  
 µS/cm = microsiemens per centimeter  
 -- = no data available  
 Blanks = field, trip and method blanks  
 NM = not measured/analyzed

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 SWS Reporting Limit = NCPQL from 9/14/94 through 12/8/06 and NCSWSL for 5/30/07 and later.  
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**Table 6**  
**Summary of Historically Detected Constituents in Surface Water**  
**City of Durham Closed Municipal Solid Waste Landfill**  
**S&ME Project No. 1054-07-469**  
**Permit No. 32-01**

Detected Monitoring Constituents/Analytes	Units	Sample Date	Detection Limit	Quantitation Limit	Solid Waste Section Limits	S-4 (Upstream)	S-1	S-2	S-3	
Turbidity (field) SWID # = 330	NTU	5/26/1998	--	--	--	--	--	--	--	
		12/1/1998	--	--	--	--	--	--	--	
		6/7/1999	--	--	--	--	12	DRY	DRY	--
		7/8/1999	--	--	--	--	229	DRY	DRY	--
		12/13/1999	--	--	--	--	139.2	DRY	DRY	146.7
		6/6/2000	--	--	--	--	42.8	DRY	DRY	DRY
		12/11/2000	--	--	--	--	27.3	DRY	DRY	DRY
		6/4/2001	--	--	--	--	17.2	18.2	90	7.6
		12/3/2001	--	--	--	--	--	DRY	DRY	2.2
		6/10/2002	--	--	--	--	3.2	DRY	DRY	2.6
		12/16/2002	--	--	--	--	6.4	9	10	5.8
		6/9/2003	--	--	--	--	34	65.2	--	18
		12/8/2003	--	--	--	--	12	25	23	13
		6/28/2004	--	--	--	--	--	--	--	--
		12/20/2004	--	--	--	--	--	--	--	--
		6/8/2005	--	--	--	--	7.55	22.1	53	8.99
		12/8/2005	--	--	--	--	88	31	66	120
		6/5/2006	--	--	--	--	15.6	26.4	DRY	17.9
		12/5/2006	--	--	--	--	4.44	20.6	27.5	8.31
		5/31/2007	--	--	--	--	0	DRY	DRY	56.9
		11/30/2007	--	--	--	--	NM	DRY	DRY	NM
5/19/2008	--	--	--	--	NM	NM	NM	NM		
11/19/2008	--	--	--	--	NM	NM	NM	NM		
6/30/2009	--	--	--	--	NM	DRY	DRY	NM		
11/30/2009	--	--	--	--	NM	NM	NM	NM		
5/20/2010	--	--	--	--	11.2	38.6	64.6	26		
11/19/2010	--	--	--	--	NM	10.5	0.3	0		
5/19/2011	--	--	--	--	0.7	13.5	80.2	0.1		
ORP (field) SWID # = 336	mV	5/31/2007	--	--	--	70	DRY	DRY	45	
		11/30/2007	--	--	--	NM	DRY	DRY	NM	
		5/19/2008	--	--	--	NM	NM	NM	NM	
		11/19/2008	--	--	--	NM	NM	NM	NM	
		6/30/2009	--	--	--	NM	DRY	DRY	NM	
		11/30/2009	--	--	--	NM	NM	NM	NM	
		5/20/2010	--	--	--	91.6	52.4	53.4	7.65	
		11/19/2010	--	--	--	NM	-72	2.6	71.5	
		5/19/2011	--	--	--	31	-122	5.1	42	
		Dissolved Oxygen (field) SWID # = 356	mg/L	12/1/2001	--	--	--	5.9	DRY	DRY
6/10/2002	--			--	--	9.1	DRY	DRY	13.3	
12/16/2002	--			--	--	11.64	10.81	10.51	11.57	
6/9/2003	--			--	--	10.16	7.8	--	10.04	
12/8/2003	--			--	--	10.5	12.6	12.5	10.5	
6/24/2004	--			--	--	8.01	4.33	7.4	7.83	
12/20/2004	--			--	--	9.93	12.2	--	10.01	
6/8/2005	--			--	--	--	--	--	--	
6/5/2006	--			--	--	6.59	5.45	DRY	6.74	
12/5/2006	--			--	--	8.25	4.46	9.89	7.24	
5/31/2007	--			--	--	8.1	DRY	DRY	7.7	
11/30/2007	--			--	--	NM	DRY	DRY	NM	
5/19/2008	--			--	--	NM	NM	NM	NM	
11/19/2008	--			--	--	NM	NM	NM	NM	
6/30/2009	--			--	--	NM	DRY	DRY	NM	
11/30/2009	--			--	--	NM	NM	NM	NM	
5/20/2010	--			--	--	8.08	8.53	7.84	7.85	
11/19/2010	--	--	--	NM	7.57	8.62	10.04			
5/19/2011	--	--	--	0.56	4.73	0.1	8.8			

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**Table 7**  
**Non-Detected Results Used to Select Statistical Tests**  
**Laboratory Analytical Data from November 2007 to May 2011**  
**City of Durham Closed Municipal Solid Waste Landfill**  
**S&ME Project No. 1054-07-469**

Parameters	Number of Detected Values	Total Number of Values	Number of NDs	Percent NDs	Selected Test
<b>Appendix I Volatile Organic Compounds</b>					
Acetone	1	44	43	98%	WRST
Benzene	6	44	38	86%	WRST
Chlorobenzene	1	44	43	98%	WRST
Chloroethane	1	44	43	98%	WRST
1,4-Dichlorobenzene	6	44	38	86%	WRST
1,1-Dichloroethane	6	44	38	86%	WRST
cis-1,2-Dichloroethene	9	44	35	80%	WRST
trans-1,2-Dichloroethene	6	44	38	86%	WRST
1,2-Dichloropropane	6	44	38	86%	WRST
Ethylbenzene	1	44	43	98%	WRST
Methylene chloride	1	44	43	98%	WRST
Tetrachloroethene	4	44	40	91%	WRST
Toluene	2	44	42	95%	WRST
Trichloroethene	6	44	38	86%	WRST
Vinyl chloride	6	44	38	86%	WRST
<b>Appendix II Compounds</b>					
Fluoride	3	4	1	25%	WRST
Mercury	1	14	13	93%	WRST
Sulfide	3	5	2	40%	WRST
<b>Appendix I Inorganic Compounds</b>					
Antimony	7	44	37	84%	WRST
Arsenic	15	44	29	66%	WRST
Barium	44	44	0	0%	T-TEST
Beryllium	18	44	26	59%	WRST
Cadmium	10	44	34	77%	WRST
Chromium	27	44	17	39%	WRST
Cobalt	25	44	19	43%	WRST
Copper	20	44	24	55%	WRST
Lead	14	44	30	68%	WRST
Nickel	32	44	12	27%	WRST
Selenium	20	44	24	55%	WRST
Silver	7	44	37	84%	WRST
Thallium	1	44	43	98%	WRST
Vanadium	18	44	26	59%	WRST
Zinc	30	44	14	32%	WRST

Notes:

1. NDs = Non-detected Results
2. WRST = Wilcoxon Rank Sum Test
3. T-TEST = Parametric T-Test

**Table 8**  
**Summary of Statistical Analyses**  
**Wilcoxon Rank Sum Test (Interwell Comparisons)**  
**Laboratory Analytical Data November 2007 to May 2011**  
**City of Durham Closed Municipal Solid Waste Landfill**  
**S&ME Project No. 1054-07-469**

Parameters	Evidence of Release MW-2	Evidence of Release MW-3R	Evidence of Release MW-4R	Evidence of Release MW-5	Evidence of Release MW-10
<b>Appendix I Volatile Organic Compounds</b>					
Acetone	no	no	no	no	no
Benzene	no	no	no	no	<b>YES</b>
Chlorobenzene	no	no	no	no	no
Chloroethane	no	no	no	no	no
1,4-Dichlorobenzene	no	no	no	no	<b>YES</b>
1,1-Dichloroethane	no	no	no	no	<b>YES</b>
cis-1,2-Dichloroethene	no	no	no	no	<b>YES</b>
trans-1,2-Dichloroethene	no	no	no	no	<b>YES</b>
1,2-Dichloropropane	no	no	no	no	<b>YES</b>
Ethylbenzene	no	no	no	no	no
Methylene chloride	no	no	no	no	no
Tetrachloroethene	no	no	no	no	<b>YES</b>
Toluene	no	no	no	no	no
Trichloroethene	no	no	no	no	<b>YES</b>
Vinyl chloride	no	no	no	no	<b>YES</b>
<b>Appendix II Compounds</b>					
Fluoride	no	--	no	no	--
Mercury	no	no	no	no	no
Sulfide	no	--	no	no	--
<b>Appendix I Inorganic Compounds</b>					
Antimony	no	no	no	no	no
Arsenic	no	no	no	no	no
Beryllium	no	no	no	no	no
Cadmium	no	no	no	no	no
Chromium	no	no	no	no	no
Cobalt	no	no	no	no	no
Copper	no	no	no	no	no
Lead	no	no	no	no	no
Nickel	no	<b>YES</b>	no	no	no
Selenium	no	no	no	no	no
Silver	no	no	no	no	no
Thallium	no	no	no	no	no
Vanadium	no	no	no	no	no
Zinc	no	no	no	no	<b>YES</b>

Notes:

1. Tests compared at the 1% significance level.
2. Statistical analysis of data was performed using the ChemStat® statistical software by Starpoint Software.
3. -- = insufficient number of data points to run analyses.

**Table 9**  
**Summary of Statistical Analyses**  
**Parametric T-Test**  
**Laboratory Analytical Data November 2007 to May 2011**  
**City of Durham Closed Municipal Solid Waste Landfill**  
**S&ME Project No. 1054-07-469**

Parameters	Evidence of Release MW-2	Evidence of Release MW-3R	Evidence of Release MW-4R	Evidence of Release MW-5	Evidence of Release MW-10
<b>Appendix I Inorganic Compound</b>					
Barium	no	YES	YES	YES	YES

Notes:

1. Tests compared at the 1% significance level.
2. Statistical analysis of data was performed using the ChemStat® statistical software by Starpoint Software.

**Table 10**  
**Two-Way Test of Proportions**  
**Non-Parametric Comparison of 95% Confidence Level to Applicable Standard**  
**Using Background and Compliance Well Locations**  
**November 2007 to May 2011**  
**City of Durham Closed Municipal Solid Waste Landfill**  
**S&ME Project No. 1054-07-469**

Parameters	Applicable 2L Groundwater Quality Standard (µg/l)	Significant Evidence of Contamination at the 95% CL
<b>Appendix I Volatile Organic Compounds</b>		
Acetone	6,000	no
Benzene	1	no
Chlorobenzene	50	no
Chloroethane	3,000	no
1,4-Dichlorobenzene	6	no
1,1-Dichloroethane	6	no
cis-1,2-Dichloroethene	70	no
trans-1,2-Dichloroethene	100	no
1,2-Dichloropropane	0.6	no
Ethylbenzene	600	no
Methylene chloride	5	no
Tetrachloroethene	0.7	no
Toluene	600	no
Trichloroethene	3	no
Vinyl chloride	0.03	no
<b>Appendix II Compounds</b>		
Fluoride	2,000	no
Mercury	1	no
Sulfide	1,000**	no
<b>Appendix I Inorganic Compounds</b>		
Antimony	1*	no
Arsenic	10	no
Beryllium	4*	no
Cadmium	2	no
Chromium	10	no
Cobalt	1*	no
Copper	1,000	no
Lead	15	no
Nickel	100	no
Selenium	20	no
Silver	20	no
Thallium	0.28*	no
Vanadium	0.3*	no
Zinc	1,000	no

Notes:

1. CL = Confidence Level
2. Statistical analysis of data was performed using the ChemStat® statistical software by Starpoint Software.
3. 2L STANDARD = North Carolina groundwater standards as promulgated by 15A North Carolina Administrative Code, Subchapter 2L.
4. \*Indicates there is currently no 2L Standard. The target analyte was compared to the Solid Waste Groundwater Protection Standard (GWPST).
5. \*\*Indicates there is currently no 2L Standard or GWPST. The target analyte was compared to the Solid Waste Section Limit (SWSL).

**Table 11**  
**Land's Formula Confidence Interval MCL Test**  
**Comparison of 95% Confidence Interval to Applicable Standard at Individual Compliance Well Locations**  
**November 2007 to May 2011**  
**City of Durham Closed Municipal Solid Waste Landfill**  
**S&ME Project No. 1054-07-469**

Parameters	Applicable 2L Groundwater Quality Standard (µg/l)	Significant Evidence of Contamination at the 95% CI	
		MW-3R	MW-10
<b>Appendix I Volatile Organic Compounds</b>			
Benzene	1	--	<b>YES</b>
1,4-Dichlorobenzene	6	--	no
1,1-Dichloroethane	6	--	<b>YES</b>
cis-1,2-Dichloroethene	70	--	<b>YES</b>
trans-1,2-Dichloroethene	100	--	no
1,2-Dichloropropane	0.6	--	<b>YES</b>
Tetrachloroethene	0.7	--	<b>YES</b>
Trichloroethene	3	--	<b>YES</b>
Vinyl chloride	0.03	--	<b>YES</b>
<b>Appendix I Inorganic Compounds</b>			
Nickel	100	<b>YES</b>	--
Zinc	1,000	--	no

Notes:

1. CI = Confidence Interval
2. Statistical analysis of data was performed using the ChemStat® statistical software by Starpoint Software.
3. 2L STANDARD = North Carolina groundwater standards as promulgated by 15A North Carolina Administrative Code, Subchapter 2L.
4. -- = Not Applicable

**Table 12**  
**Parametric Tolerance Interval Analysis**  
**Parametric Comparison of Tolerance Limit to Applicable Standard**  
**November 2007 to May 2011**  
**City of Durham Closed Municipal Solid Waste Landfill**  
**S&ME Project No. 1054-07-469**

Parameters	Applicable 2L Groundwater Quality Standard (µg/l)	Statistical Evidence of Contamination				
		MW-2	MW-3R	MW-4R	MW-5	MW-10
<b>Appendix I Inorganic Compound</b>						
Barium	700	no	YES	YES	YES	no

Notes:

1. Statistical analysis of data was performed using the ChemStat® statistical software by Starpoint Software.
2. 2L STANDARD = North Carolina groundwater standards as promulgated by 15A North Carolina Administrative Code, Subchapter 2L.

**APPENDIX I**  
**GROUNDWATER SAMPLING LOGS**

**GROUNDWATER SAMPLE COLLECTION SHEET**

**Project Name:** City of Durham Closed (MSWLF) **Date:** 5/19/2011  
**Job Number:** 1054-07-469 **Sampler:** JP/MP/BB

<b>WELL I.D.</b>	<b>MW-9R</b>	<b>MW-2</b>	<b>MW-3R</b>	<b>MW-4R</b>	<b>MW-5</b>
Casing Diameter (in.)	2	2	2	2	2
Total Well depth (ft.)	22.55	19.62	17.65	17.39	21.77
Water Depth	13.48	4.48	3.27	2.30	8.40
<b>PURGE DATA</b>					
Water Column (Total depth – Water depth)	9.07	15.14	14.38	15.63	13.37
Well Volume	1.47	2.46	2.34	2.55	2.17
Volume to Purge (3 to 5 well volumes)	N/A	N/A	N/A	N/A	N/A
Volume Purged (note if well bailed dry)	N/A	N/A	N/A	N/A	N/A
Date Purged	5/19/2011	5/19/2011	5/19/2011	5/19/2011	5/19/2011
<b>FIELD ANALYSIS DATA</b>					
<b>INITIAL PURGE PARAMETERS</b>					
pH	5.50	6.55	6.44	7.12	6.54
Conductivity (µS/cm)	0.042	0.070	0.91	0.489	0.644
Temperature (C)	16.27	15.51	13.96	14.48	14.33
Turbidity (NTU)	65	0.5	12.3	3.7	67.3
Dissolved Oxygen (mg/L)	3.29	2.86	0.64	0.98	0.50
Oxygen Reduction Potential (mV)	202.4	45.9	-133	-30	0.8
<b>STABILIZED PURGE PARAMETERS</b>					
pH	4.72	5.35	6.60	6.75	6.83
Conductivity (µS/cm)	0.041	0.054	0.92	0.501	0.637
Temperature (C)	16.30	14.39	13.87	14.45	14.17
Turbidity (NTU)	18.5	36	8.4	1.4	11.7
Dissolved Oxygen (mg/L)	1.83	6.48	0.2	0.77	0.09
Oxygen Reduction Potential (mV)	194	91	-151	-9.4	-29.9
<b>GROUNDWATER SAMPLE DATA</b>					
Date Sampled	5/19/2011	5/19/2011	5/19/2011	5/19/2011	5/19/2011
Time Sampled	1000	1200	1430	1506	1045
Equipment Blank	-	-	-	-	-
Parameters	Appendix I	Appendix I	Appendix I	Appendix I	Appendix I
Note: Volumes Per foot of Water Column For: 2" Well = 0.16 gal./ft. 4" Well = 0.66 gal./ft. 6" Well = 1.50 gal./ft.					
	0.16	0.16	0.16	0.16	0.16
<b>Remarks:</b> All wells sampled with dedicated bladder pumps and YSI Flow Thru Cell.					

**GROUNDWATER SAMPLE COLLECTION SHEET**

**Project Name:** City of Durham Closed (MSWLF) **Date:** 5/19/2011  
**Job Number:** 1054-07-469 **Sampler:** JP/MP/BB

<b>WELL I.D.</b>	<b>MW-10</b>	<b>MW-11</b>	<b>PZ-2R*</b>	<b>PZ-3*</b>	<b>PZ-4R*</b>	<b>PZ-6*</b>
Casing Diameter (in.)	2	2	2	2	2	2
Total Well depth (ft.)	16.50	15.52	34.59	42.40	38.38	61.25
Water Depth	6.81	2.06	25.20	32.95	22.75	NM
<b>PURGE DATA</b>						
Water Column (Total depth – Water depth)	9.69	13.46	-	-	-	-
Well Volume	1.58	2.19	-	-	-	-
Volume to Purge (3 to 5 well volumes)	N/A	N/A	-	-	-	-
Volume Purged (note if well bailed dry)	N/A	N/A	-	-	-	-
Date Purged	5/19/2011	5/19/2011	-	-	-	-
<b>FIELD ANALYSIS DATA</b>						
<b>INITIAL PURGE PARAMETERS</b>						
pH	5.58	7.03	-	-	-	-
Conductivity (µS/cm)	0.486	0.71	-	-	-	-
Temperature (C)	14.34	15.23	-	-	-	-
Turbidity (NTU)	290	1.6	-	-	-	-
Dissolved Oxygen (mg/L)	0.77	0.59	-	-	-	-
Oxygen Reduction Potential (mV)	-82	-155	-	-	-	-
<b>STABILIZED PURGE PARAMETERS</b>						
pH	5.53	6.94	-	-	-	-
Conductivity (µS/cm)	0.223	0.70	-	-	-	-
Temperature (C)	14.42	14.69	-	-	-	-
Turbidity (NTU)	12	10	-	-	-	-
Dissolved Oxygen (mg/L)	0.13	0.1	-	-	-	-
Oxygen Reduction Potential (mV)	-23	-201	-	-	-	-
<b>GROUNDWATER SAMPLE DATA</b>						
Date Sampled	5/19/2011	5/19/2011	-	-	-	-
Time Sampled	1350	1100	-	-	-	-
Equipment Blank	-	-	-	-	-	-
Parameters	Appendix I	Appendix I (Metals only)	-	-	-	-
Note: Volumes Per foot of Water Column For: 2" Well = 0.16 gal./ft. 4" Well = 0.66 gal./ft. 6" Well = 1.50 gal./ft.	0.16	0.16	-	-	-	-
Remarks: All wells sampled with dedicated bladder pumps and YSI Flow Thru Cell. * = Monitoring well gauged for water level only, groundwater samples not collected.						

**GROUNDWATER SAMPLE COLLECTION SHEET**

**Project Name:** City of Durham Closed (MSWLF) **Date:** 5/19/2011  
**Job Number:** 1054-07-469 **Sampler:** JP/MP/BB

<b>WELL I.D.</b>	<b>MW-3*</b>	<b>MW-6R*</b>	<b>MW-7R</b>	<b>MW-8</b>		
Casing Diameter (in.)	2	2	2	2		
Total Well depth (ft.)	25.33	26.72	44.1	16.52		
Water Depth	3.84	11.70	15.67	8.70		
<b>PURGE DATA</b>						
Water Column (Total depth – Water depth)	-	-	-	-		
Well Volume	-	-	-	-		
Volume to Purge (3 to 5 well volumes)	-	-	-	-		
Volume Purged (note if well bailed dry)	-	-	-	-		
Date Purged	-	-	-	-		
<b>FIELD ANALYSIS DATA</b>						
<b>INITIAL PURGE PARAMETERS</b>						
pH	-	-	-	-		
Conductivity (µS/cm)	-	-	-	-		
Temperature (C)	-	-	-	-		
Turbidity (NTU)	-	-	-	-		
Dissolved Oxygen (mg/L)	-	-	-	-		
Oxygen Reduction Potential (mV)	-	-	-	-		
<b>STABILIZED PURGE PARAMETERS</b>						
pH	-	-	-	-		
Conductivity (µS/cm)	-	-	-	-		
Temperature (C)	-	-	-	-		
Turbidity (NTU)	-	-	-	-		
Dissolved Oxygen (mg/L)	-	-	-	-		
Oxygen Reduction Potential (mV)	-	-	-	-		
<b>GROUNDWATER SAMPLE DATA</b>						
Date Sampled	-	-	-	-		
Time Sampled	-	-	-	-		
Equipment Blank	-	-	-	-		
Parameters	-	-	-	-		
	-	-	-	-		
Note: Volumes Per foot of Water Column For: 2" Well = 0.16 gal./ft. 4" Well = 0.66 gal./ft. 6" Well = 1.50 gal./ft.	-	-	-	-		
Remarks: All wells sampled with dedicated bladder pumps and YSI Flow Thru Cell. * = Monitoring well gauged for water level only, groundwater samples not collected.						

**APPENDIX II**  
**CERTIFICATES-OF-ANALYSIS, CHAIN-OF-CUSTODY**  
**FORMS AND LABORATORY DATA**

**Environmental Conservation Laboratories, Inc.**

102-A Woodwinds Industrial Court

Cary NC, 27511

Phone: 919.467.3090 FAX: 919.467.3515



www.encolabs.com

Thursday, June 2, 2011

S&ME, Inc. (SM001)

Attn: Gerald Paul

3201 Spring Forest Road

Raleigh, NC 27616

**RE: Laboratory Results for**

**Project Number: 1054-07-469, Project Name/Desc: City of Durham Closed MSWLF**

**ENCO Workorder: C105631**

Dear Gerald Paul,

Enclosed is a copy of your laboratory report for test samples received by our laboratory on Friday, May 20, 2011.

Unless otherwise noted in an attached project narrative, all samples were received in acceptable condition and processed in accordance with the referenced methods/procedures. Results for these procedures apply only to the samples as submitted.

The analytical results contained in this report are in compliance with NELAC standards, except as noted in the project narrative. This report shall not be reproduced except in full, without the written approval of the Laboratory.

This report contains only those analyses performed by Environmental Conservation Laboratories. Unless otherwise noted, all analyses were performed at ENCO Cary. Data from outside organizations will be reported under separate cover.

If you have any questions or require further information, please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink that reads 'Chuck Smith'.

Chuck Smith

Project Manager

Enclosure(s)



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**SAMPLE SUMMARY/LABORATORY CHRONICLE**

Client ID:	3201-MW2	Lab ID: C105631-01	Sampled: 05/19/11 12:00	Received: 05/20/11 09:15
Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)	
EPA 6010C	11/15/11	05/23/11 09:52	5/24/2011 12:17	
EPA 6020A	11/15/11	05/23/11 11:31	5/27/2011 12:43	
EPA 8260B	06/02/11	05/24/11 10:33	5/25/2011 12:41	

Client ID:	3201-MW3R	Lab ID: C105631-02	Sampled: 05/19/11 14:30	Received: 05/20/11 09:15
Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)	
EPA 6010C	11/15/11	05/23/11 09:52	5/24/2011 13:10	
EPA 6020A	11/15/11	05/23/11 11:34	5/25/2011 15:56	
EPA 8260B	06/02/11	05/24/11 10:33	5/25/2011 13:11	

Client ID:	3201-MW4R	Lab ID: C105631-03	Sampled: 05/19/11 15:06	Received: 05/20/11 09:15
Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)	
EPA 6010C	11/15/11	05/23/11 09:52	5/24/2011 13:12	
EPA 6020A	11/15/11	05/23/11 11:34	5/25/2011 15:59	
EPA 8260B	06/02/11	05/24/11 10:33	5/25/2011 13:40	

Client ID:	3201-MW5	Lab ID: C105631-04	Sampled: 05/19/11 10:45	Received: 05/20/11 09:15
Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)	
EPA 6010C	11/15/11	05/23/11 09:52	5/24/2011 13:14	
EPA 6020A	11/15/11	05/23/11 11:34	5/25/2011 16:03	

Client ID:	3201-MW5	Lab ID: C105631-04RE1	Sampled: 05/19/11 10:45	Received: 05/20/11 09:15
Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)	
EPA 8260B	06/02/11	05/27/11 13:38	5/27/2011 22:10	

Client ID:	3201-MW9R	Lab ID: C105631-05	Sampled: 05/19/11 10:00	Received: 05/20/11 09:15
Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)	
EPA 6010C	11/15/11	05/23/11 09:52	5/24/2011 13:17	
EPA 6020A	11/15/11	05/23/11 11:34	5/25/2011 16:07	
EPA 8260B	06/02/11	05/25/11 08:49	5/26/2011 11:06	

Client ID:	3201-MW10	Lab ID: C105631-06	Sampled: 05/19/11 13:50	Received: 05/20/11 09:15
Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)	
EPA 6010C	11/15/11	05/23/11 09:52	5/24/2011 13:19	
EPA 6020A	11/15/11	05/23/11 11:34	5/25/2011 16:18	



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Client ID:	3201-MW10	Lab ID: C105631-06RE1	Sampled: 05/19/11 13:50	Received: 05/20/11 09:15
Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)	
EPA 8260B	06/02/11	05/27/11 13:40	5/27/2011 22:40	

Client ID:	3201-MW11	Lab ID: C105631-07	Sampled: 05/19/11 11:00	Received: 05/20/11 09:15
Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)	
EPA 6010C	11/15/11	05/23/11 09:52	5/24/2011 13:22	
EPA 6020A	11/15/11	05/23/11 11:34	5/25/2011 16:22	

Client ID:	3201-Duplicate	Lab ID: C105631-08	Sampled: 05/19/11 08:00	Received: 05/20/11 09:15
Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)	
EPA 6010C	11/15/11	05/24/11 09:38	5/25/2011 10:45	
EPA 6020A	11/15/11	05/23/11 11:34	5/25/2011 16:25	

Client ID:	3201-Duplicate	Lab ID: C105631-08RE1	Sampled: 05/19/11 08:00	Received: 05/20/11 09:15
Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)	
EPA 8260B	06/02/11	05/27/11 13:40	5/27/2011 23:09	

Client ID:	3201-S1	Lab ID: C105631-09	Sampled: 05/19/11 11:03	Received: 05/20/11 09:15
Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)	
EPA 6010C	11/15/11	05/24/11 09:38	5/25/2011 10:47	
EPA 6020A	11/15/11	05/23/11 11:34	5/25/2011 16:29	
EPA 8260B	06/02/11	05/25/11 08:49	5/26/2011 13:04	

Client ID:	3201-S2	Lab ID: C105631-10	Sampled: 05/19/11 14:00	Received: 05/20/11 09:15
Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)	
EPA 6010C	11/15/11	05/24/11 09:38	5/25/2011 10:50	
EPA 6020A	11/15/11	05/23/11 11:34	5/25/2011 16:33	
EPA 8260B	06/02/11	05/25/11 08:49	5/26/2011 13:33	

Client ID:	3201-S3	Lab ID: C105631-11	Sampled: 05/19/11 15:40	Received: 05/20/11 09:15
Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)	
EPA 6010C	11/15/11	05/24/11 09:38	5/25/2011 10:52	
EPA 6020A	11/15/11	05/23/11 11:34	5/25/2011 16:37	
EPA 8260B	06/02/11	05/25/11 08:49	5/26/2011 14:03	

Client ID:	3201-S4	Lab ID: C105631-12	Sampled: 05/19/11 15:25	Received: 05/20/11 09:15
Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)	
EPA 6010C	11/15/11	05/24/11 09:38	5/25/2011 10:54	
EPA 6020A	11/15/11	05/23/11 11:34	5/25/2011 16:40	
EPA 8260B	06/02/11	05/25/11 08:49	5/26/2011 14:32	



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Client ID:	3201-Equipment Blank	Lab ID: C105631-13	Sampled: 05/19/11 18:00	Received: 05/20/11 09:15
Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)	
EPA 6010C	11/15/11	05/24/11 09:38	5/25/2011 10:56	
EPA 6020A	11/15/11	05/23/11 11:34	5/25/2011 16:44	
EPA 8260B	06/02/11	05/25/11 08:49	5/26/2011 15:01	

Client ID:	3201-Trip Blank	Lab ID: C105631-14RE1	Sampled: 05/19/11 08:00	Received: 05/20/11 09:15
Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)	
EPA 8260B	06/02/11	05/27/11 13:40	5/27/2011 23:39	



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**NORTH CAROLINA SWS SAMPLE DETECTION SUMMARY**

**Client ID: 3201-MW2 Lab ID: C105631-01**

Analyte	Results	Flag	DF	MDL	MRL	NC SWSL	Units	Method	Notes
Barium - Total	83.0	J	1	1.00	10.0	100	ug/L	EPA 6010C	
Beryllium - Total	0.242	J	1	0.100	1.00	1	ug/L	EPA 6010C	
Chromium - Total	8.21	J	1	1.00	10.0	10	ug/L	EPA 6010C	
Copper - Total	2.62	J	1	1.60	10.0	10	ug/L	EPA 6010C	
Nickel - Total	2.99	J	1	1.80	10.0	50	ug/L	EPA 6010C	
Vanadium - Total	3.86	J	1	1.40	10.0	25	ug/L	EPA 6010C	
Zinc - Total	7.80	J	1	3.80	10.0	10	ug/L	EPA 6010C	

**Client ID: 3201-MW3R Lab ID: C105631-02**

Analyte	Results	Flag	DF	MDL	MRL	NC SWSL	Units	Method	Notes
Barium - Total	116		1	1.00	10.0	100	ug/L	EPA 6010C	
Chromium - Total	4.85	J	1	1.00	10.0	10	ug/L	EPA 6010C	
Cobalt - Total	1.70	J	1	1.10	10.0	10	ug/L	EPA 6010C	
Copper - Total	2.50	J	1	1.60	10.0	10	ug/L	EPA 6010C	
Nickel - Total	6.92	J	1	1.80	10.0	50	ug/L	EPA 6010C	
Selenium - Total	2.87	J	1	0.830	1.00	10	ug/L	EPA 6020A	
Vanadium - Total	1.47	J	1	1.40	10.0	25	ug/L	EPA 6010C	

**Client ID: 3201-MW4R Lab ID: C105631-03**

Analyte	Results	Flag	DF	MDL	MRL	NC SWSL	Units	Method	Notes
Barium - Total	562		1	1.00	10.0	100	ug/L	EPA 6010C	
Chromium - Total	1.37	J	1	1.00	10.0	10	ug/L	EPA 6010C	
Nickel - Total	3.94	J	1	1.80	10.0	50	ug/L	EPA 6010C	
Selenium - Total	1.76	J	1	0.830	1.00	10	ug/L	EPA 6020A	

**Client ID: 3201-MW5 Lab ID: C105631-04**

Analyte	Results	Flag	DF	MDL	MRL	NC SWSL	Units	Method	Notes
Barium - Total	1860		1	1.00	10.0	100	ug/L	EPA 6010C	
Chromium - Total	1.29	J	1	1.00	10.0	10	ug/L	EPA 6010C	
Nickel - Total	3.31	J	1	1.80	10.0	50	ug/L	EPA 6010C	
Selenium - Total	2.14	J	1	0.830	1.00	10	ug/L	EPA 6020A	

**Client ID: 3201-MW9R Lab ID: C105631-05**

Analyte	Results	Flag	DF	MDL	MRL	NC SWSL	Units	Method	Notes
Barium - Total	53.1	J	1	1.00	10.0	100	ug/L	EPA 6010C	
Beryllium - Total	0.549	J	1	0.100	1.00	1	ug/L	EPA 6010C	
Chromium - Total	1.30	J	1	1.00	10.0	10	ug/L	EPA 6010C	
Cobalt - Total	6.93	J	1	1.10	10.0	10	ug/L	EPA 6010C	
Copper - Total	1.99	J	1	1.60	10.0	10	ug/L	EPA 6010C	
Nickel - Total	3.03	J	1	1.80	10.0	50	ug/L	EPA 6010C	
Zinc - Total	6.26	J	1	3.80	10.0	10	ug/L	EPA 6010C	

**Client ID: 3201-MW10 Lab ID: C105631-06**

Analyte	Results	Flag	DF	MDL	MRL	NC SWSL	Units	Method	Notes
Arsenic - Total	5.23	J	1	2.80	10.0	10	ug/L	EPA 6010C	
Barium - Total	248		1	1.00	10.0	100	ug/L	EPA 6010C	
Beryllium - Total	0.140	J	1	0.100	1.00	1	ug/L	EPA 6010C	
Chromium - Total	4.17	J	1	1.00	10.0	10	ug/L	EPA 6010C	



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**Client ID: 3201-MW10** **Lab ID: C105631-06**

Analyte	Results	Flag	DF	MDL	MRL	NC SWSL	Units	Method	Notes
Cobalt - Total	5.31	J	1	1.10	10.0	10	ug/L	EPA 6010C	
Copper - Total	6.08	J	1	1.60	10.0	10	ug/L	EPA 6010C	
Nickel - Total	6.16	J	1	1.80	10.0	50	ug/L	EPA 6010C	
Selenium - Total	3.01	J	1	0.830	1.00	10	ug/L	EPA 6020A	
Vanadium - Total	3.89	J	1	1.40	10.0	25	ug/L	EPA 6010C	
Zinc - Total	9.03	J	1	3.80	10.0	10	ug/L	EPA 6010C	

**Client ID: 3201-MW10** **Lab ID: C105631-06RE1**

Analyte	Results	Flag	DF	MDL	MRL	NC SWSL	Units	Method	Notes
1,1-Dichloroethane	3.2	J	1	0.080	1.0	5	ug/L	EPA 8260B	
1,2-Dichloropropane	2.2		1	0.59	1.0	1	ug/L	EPA 8260B	
1,4-Dichlorobenzene	0.98	J	1	0.79	1.0	1	ug/L	EPA 8260B	
Benzene	1.7		1	0.68	1.0	1	ug/L	EPA 8260B	
cis-1,2-Dichloroethene	110		1	0.72	1.0	5	ug/L	EPA 8260B	
trans-1,2-Dichloroethene	4.2	J	1	0.12	1.0	5	ug/L	EPA 8260B	
Trichloroethene	12		1	0.72	1.0	1	ug/L	EPA 8260B	
Vinyl chloride	12		1	0.60	1.0	1	ug/L	EPA 8260B	

**Client ID: 3201-MW11** **Lab ID: C105631-07**

Analyte	Results	Flag	DF	MDL	MRL	NC SWSL	Units	Method	Notes
Barium - Total	1120		1	1.00	10.0	100	ug/L	EPA 6010C	
Chromium - Total	1.47	J	1	1.00	10.0	10	ug/L	EPA 6010C	
Cobalt - Total	2.16	J	1	1.10	10.0	10	ug/L	EPA 6010C	
Nickel - Total	1.98	J	1	1.80	10.0	50	ug/L	EPA 6010C	
Selenium - Total	1.84	J	1	0.830	1.00	10	ug/L	EPA 6020A	

**Client ID: 3201-Duplicate** **Lab ID: C105631-08**

Analyte	Results	Flag	DF	MDL	MRL	NC SWSL	Units	Method	Notes
Arsenic - Total	6.16	J	1	2.80	10.0	10	ug/L	EPA 6010C	
Barium - Total	237		1	1.00	10.0	100	ug/L	EPA 6010C	
Beryllium - Total	0.205	J	1	0.100	1.00	1	ug/L	EPA 6010C	
Chromium - Total	3.73	J	1	1.00	10.0	10	ug/L	EPA 6010C	
Cobalt - Total	5.17	J	1	1.10	10.0	10	ug/L	EPA 6010C	
Copper - Total	4.90	J	1	1.60	10.0	10	ug/L	EPA 6010C	
Nickel - Total	5.34	J	1	1.80	10.0	50	ug/L	EPA 6010C	
Selenium - Total	2.49	J	1	0.830	1.00	10	ug/L	EPA 6020A	
Vanadium - Total	3.89	J	1	1.40	10.0	25	ug/L	EPA 6010C	
Zinc - Total	9.40	J	1	3.80	10.0	10	ug/L	EPA 6010C	

**Client ID: 3201-Duplicate** **Lab ID: C105631-08RE1**

Analyte	Results	Flag	DF	MDL	MRL	NC SWSL	Units	Method	Notes
1,1-Dichloroethane	3.3	J	1	0.080	1.0	5	ug/L	EPA 8260B	
1,2-Dichloropropane	2.1		1	0.59	1.0	1	ug/L	EPA 8260B	
1,4-Dichlorobenzene	1.1		1	0.79	1.0	1	ug/L	EPA 8260B	
Benzene	1.6		1	0.68	1.0	1	ug/L	EPA 8260B	
cis-1,2-Dichloroethene	110		1	0.72	1.0	5	ug/L	EPA 8260B	
trans-1,2-Dichloroethene	4.3	J	1	0.12	1.0	5	ug/L	EPA 8260B	
Trichloroethene	12		1	0.72	1.0	1	ug/L	EPA 8260B	
Vinyl chloride	11		1	0.60	1.0	1	ug/L	EPA 8260B	



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**Client ID: 3201-S1** **Lab ID: C105631-09**

Analyte	Results	Flag	DF	MDL	MRL	NC SWSL	Units	Method	Notes
Arsenic - Total	5.00	J	1	2.80	10.0	10	ug/L	EPA 6010C	
Barium - Total	108		1	1.00	10.0	100	ug/L	EPA 6010C	
Chromium - Total	1.44	J	1	1.00	10.0	10	ug/L	EPA 6010C	
Cobalt - Total	4.66	J	1	1.10	10.0	10	ug/L	EPA 6010C	
Copper - Total	2.11	J	1	1.60	10.0	10	ug/L	EPA 6010C	
Nickel - Total	4.40	J	1	1.80	10.0	50	ug/L	EPA 6010C	
Selenium - Total	1.70	J	1	0.830	1.00	10	ug/L	EPA 6020A	
Zinc - Total	4.56	J	1	3.80	10.0	10	ug/L	EPA 6010C	

**Client ID: 3201-S2** **Lab ID: C105631-10**

Analyte	Results	Flag	DF	MDL	MRL	NC SWSL	Units	Method	Notes
Barium - Total	65.2	J	1	1.00	10.0	100	ug/L	EPA 6010C	
Beryllium - Total	0.135	J	1	0.100	1.00	1	ug/L	EPA 6010C	
Chromium - Total	2.95	J	1	1.00	10.0	10	ug/L	EPA 6010C	
Cobalt - Total	1.75	J	1	1.10	10.0	10	ug/L	EPA 6010C	
Copper - Total	3.75	J	1	1.60	10.0	10	ug/L	EPA 6010C	
Lead - Total	2.90	J	1	1.90	10.0	10	ug/L	EPA 6010C	
Nickel - Total	3.14	J	1	1.80	10.0	50	ug/L	EPA 6010C	
Selenium - Total	1.32	J	1	0.830	1.00	10	ug/L	EPA 6020A	
Vanadium - Total	5.00	J	1	1.40	10.0	25	ug/L	EPA 6010C	
Zinc - Total	10.1		1	3.80	10.0	10	ug/L	EPA 6010C	

**Client ID: 3201-S3** **Lab ID: C105631-11**

Analyte	Results	Flag	DF	MDL	MRL	NC SWSL	Units	Method	Notes
Antimony - Total	0.292	J	1	0.220	2.00	6	ug/L	EPA 6020A	
Barium - Total	15.5	J	1	1.00	10.0	100	ug/L	EPA 6010C	
Cobalt - Total	1.22	J	1	1.10	10.0	10	ug/L	EPA 6010C	
Copper - Total	1.93	J	1	1.60	10.0	10	ug/L	EPA 6010C	
Nickel - Total	2.05	J	1	1.80	10.0	50	ug/L	EPA 6010C	
Selenium - Total	1.81	J	1	0.830	1.00	10	ug/L	EPA 6020A	
Vanadium - Total	2.84	J	1	1.40	10.0	25	ug/L	EPA 6010C	
Zinc - Total	36.8		1	3.80	10.0	10	ug/L	EPA 6010C	

**Client ID: 3201-S4** **Lab ID: C105631-12**

Analyte	Results	Flag	DF	MDL	MRL	NC SWSL	Units	Method	Notes
Antimony - Total	0.271	J	1	0.220	2.00	6	ug/L	EPA 6020A	
Barium - Total	14.3	J	1	1.00	10.0	100	ug/L	EPA 6010C	
Copper - Total	1.60	J	1	1.60	10.0	10	ug/L	EPA 6010C	
Lead - Total	2.31	J	1	1.90	10.0	10	ug/L	EPA 6010C	
Nickel - Total	2.11	J	1	1.80	10.0	50	ug/L	EPA 6010C	
Selenium - Total	1.88	J	1	0.830	1.00	10	ug/L	EPA 6020A	
Vanadium - Total	2.97	J	1	1.40	10.0	25	ug/L	EPA 6010C	
Zinc - Total	37.1		1	3.80	10.0	10	ug/L	EPA 6010C	

**Client ID: 3201-Equipment Blank** **Lab ID: C105631-13**

Analyte	Results	Flag	DF	MDL	MRL	NC SWSL	Units	Method	Notes
Barium - Total	1.14	J	1	1.00	10.0	100	ug/L	EPA 6010C	
Zinc - Total	4.26	J	1	3.80	10.0	10	ug/L	EPA 6010C	



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### ANALYTICAL RESULTS

Description: 3201-MW2

Lab Sample ID: C105631-01

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 12:00

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

#### Volatile Organic Compounds by GCMS

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
1,1,1,2-Tetrachloroethane [630-20-6] ^	0.90	U	ug/L	1	0.90	1.0	5	EPA 8260B	05/25/11 12:41	JKG	
1,1,1-Trichloroethane [71-55-6] ^	0.65	U	ug/L	1	0.65	1.0	1	EPA 8260B	05/25/11 12:41	JKG	
1,1,2,2-Tetrachloroethane [79-34-5] ^	0.75	U	ug/L	1	0.75	1.0	3	EPA 8260B	05/25/11 12:41	JKG	
1,1,2-Trichloroethane [79-00-5] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	05/25/11 12:41	JKG	
1,1-Dichloroethane [75-34-3] ^	0.080	U	ug/L	1	0.080	1.0	5	EPA 8260B	05/25/11 12:41	JKG	
1,1-Dichloroethene [75-35-4] ^	0.60	U	ug/L	1	0.60	1.0	5	EPA 8260B	05/25/11 12:41	JKG	
1,2,3-Trichloropropane [96-18-4] ^	0.72	U	ug/L	1	0.72	1.0	1	EPA 8260B	05/25/11 12:41	JKG	
1,2-Dibromo-3-chloropropane [96-12-8] ^	0.48	U	ug/L	1	0.48	1.0	13	EPA 8260B	05/25/11 12:41	JKG	
1,2-Dibromoethane [106-93-4] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	05/25/11 12:41	JKG	
1,2-Dichlorobenzene [95-50-1] ^	0.11	U	ug/L	1	0.11	1.0	5	EPA 8260B	05/25/11 12:41	JKG	
1,2-Dichloroethane [107-06-2] ^	0.47	U	ug/L	1	0.47	1.0	1	EPA 8260B	05/25/11 12:41	JKG	
1,2-Dichloropropane [78-87-5] ^	0.59	U	ug/L	1	0.59	1.0	1	EPA 8260B	05/25/11 12:41	JKG	
1,4-Dichlorobenzene [106-46-7] ^	0.79	U	ug/L	1	0.79	1.0	1	EPA 8260B	05/25/11 12:41	JKG	
2-Butanone [78-93-3] ^	1.3	U	ug/L	1	1.3	5.0	100	EPA 8260B	05/25/11 12:41	JKG	
2-Hexanone [591-78-6] ^	0.88	U	ug/L	1	0.88	5.0	50	EPA 8260B	05/25/11 12:41	JKG	
4-Methyl-2-pentanone [108-10-1] ^	1.1	U	ug/L	1	1.1	5.0	100	EPA 8260B	05/25/11 12:41	JKG	
Acetone [67-64-1] ^	1.2	U	ug/L	1	1.2	5.0	100	EPA 8260B	05/25/11 12:41	JKG	
Acrylonitrile [107-13-1] ^	3.5	U	ug/L	1	3.5	10	200	EPA 8260B	05/25/11 12:41	JKG	
Benzene [71-43-2] ^	0.68	U	ug/L	1	0.68	1.0	1	EPA 8260B	05/25/11 12:41	JKG	
Bromochloromethane [74-97-5] ^	0.87	U	ug/L	1	0.87	1.0	3	EPA 8260B	05/25/11 12:41	JKG	
Bromodichloromethane [75-27-4] ^	0.75	U	ug/L	1	0.75	1.0	1	EPA 8260B	05/25/11 12:41	JKG	
Bromoform [75-25-2] ^	0.68	U	ug/L	1	0.68	1.0	3	EPA 8260B	05/25/11 12:41	JKG	
Bromomethane [74-83-9] ^	0.58	U	ug/L	1	0.58	1.0	10	EPA 8260B	05/25/11 12:41	JKG	
Carbon disulfide [75-15-0] ^	1.5	U	ug/L	1	1.5	5.0	100	EPA 8260B	05/25/11 12:41	JKG	
Carbon tetrachloride [56-23-5] ^	0.69	U	ug/L	1	0.69	1.0	1	EPA 8260B	05/25/11 12:41	JKG	
Chlorobenzene [108-90-7] ^	0.74	U	ug/L	1	0.74	1.0	3	EPA 8260B	05/25/11 12:41	JKG	
Chloroethane [75-00-3] ^	0.75	U	ug/L	1	0.75	1.0	10	EPA 8260B	05/25/11 12:41	JKG	
Chloroform [67-66-3] ^	0.70	U	ug/L	1	0.70	1.0	5	EPA 8260B	05/25/11 12:41	JKG	
Chloromethane [74-87-3] ^	0.55	U	ug/L	1	0.55	1.0	1	EPA 8260B	05/25/11 12:41	JKG	
cis-1,2-Dichloroethene [156-59-2] ^	0.72	U	ug/L	1	0.72	1.0	5	EPA 8260B	05/25/11 12:41	JKG	
cis-1,3-Dichloropropene [10061-01-5] ^	0.075	U	ug/L	1	0.075	1.0	1	EPA 8260B	05/25/11 12:41	JKG	
Dibromochloromethane [124-48-1] ^	0.63	U	ug/L	1	0.63	1.0	3	EPA 8260B	05/25/11 12:41	JKG	
Dibromomethane [74-95-3] ^	0.90	U	ug/L	1	0.90	1.0	10	EPA 8260B	05/25/11 12:41	JKG	
Ethylbenzene [100-41-4] ^	0.62	U	ug/L	1	0.62	1.0	1	EPA 8260B	05/25/11 12:41	JKG	
Iodomethane [74-88-4] ^	1.7	U	ug/L	1	1.7	5.0	10	EPA 8260B	05/25/11 12:41	JKG	
Methylene chloride [75-09-2] ^	0.14	U	ug/L	1	0.14	1.0	1	EPA 8260B	05/25/11 12:41	JKG	
Styrene [100-42-5] ^	0.053	U	ug/L	1	0.053	1.0	1	EPA 8260B	05/25/11 12:41	JKG	
Tetrachloroethene [127-18-4] ^	0.73	U	ug/L	1	0.73	1.0	1	EPA 8260B	05/25/11 12:41	JKG	
Toluene [108-88-3] ^	0.85	U	ug/L	1	0.85	1.0	1	EPA 8260B	05/25/11 12:41	JKG	
trans-1,2-Dichloroethene [156-60-5] ^	0.12	U	ug/L	1	0.12	1.0	5	EPA 8260B	05/25/11 12:41	JKG	
trans-1,3-Dichloropropene [10061-02-6] ^	0.50	U	ug/L	1	0.50	1.0	1	EPA 8260B	05/25/11 12:41	JKG	
trans-1,4-Dichloro-2-butene [110-57-6] ^	0.70	U	ug/L	1	0.70	1.0	100	EPA 8260B	05/25/11 12:41	JKG	
Trichloroethene [79-01-6] ^	0.72	U	ug/L	1	0.72	1.0	1	EPA 8260B	05/25/11 12:41	JKG	



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Description: 3201-MW2

Lab Sample ID: C105631-01

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 12:00

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

**Volatile Organic Compounds by GCMS**

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Trichlorofluoromethane [75-69-4] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	05/25/11 12:41	JKG	
Vinyl acetate [108-05-4] ^	0.95	U	ug/L	1	0.95	5.0	50	EPA 8260B	05/25/11 12:41	JKG	
Vinyl chloride [75-01-4] ^	0.60	U	ug/L	1	0.60	1.0	1	EPA 8260B	05/25/11 12:41	JKG	
Xylenes (Total) [1330-20-7] ^	2.1	U	ug/L	1	2.1	3.0	5	EPA 8260B	05/25/11 12:41	JKG	

Surrogates	Results	DF	Spike Lvl	% Rec	% Rec Limits	Batch	Method	Analyzed	By	Notes
4-Bromofluorobenzene	45	1	50.0	91 %	51-122	1E24016	EPA 8260B	05/25/11 12:41	JKG	
Dibromofluoromethane	47	1	50.0	94 %	68-117	1E24016	EPA 8260B	05/25/11 12:41	JKG	
Toluene-d8	46	1	50.0	93 %	69-110	1E24016	EPA 8260B	05/25/11 12:41	JKG	



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Description: 3201-MW2

Lab Sample ID: C105631-01

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 12:00

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Antimony [7440-36-0] ^	0.220	U	ug/L	1	0.220	2.00	6	EPA 6020A	05/27/11 12:43	VLO	
Arsenic [7440-38-2] ^	2.80	U	ug/L	1	2.80	10.0	10	EPA 6010C	05/24/11 12:17	VLO	
<b>Barium [7440-39-3] ^</b>	<b>83.0</b>	J	ug/L	1	1.00	10.0	100	EPA 6010C	05/24/11 12:17	VLO	
<b>Beryllium [7440-41-7] ^</b>	<b>0.242</b>	J	ug/L	1	0.100	1.00	1	EPA 6010C	05/24/11 12:17	VLO	
Cadmium [7440-43-9] ^	0.360	U	ug/L	1	0.360	1.00	1	EPA 6010C	05/24/11 12:17	VLO	
<b>Chromium [7440-47-3] ^</b>	<b>8.21</b>	J	ug/L	1	1.00	10.0	10	EPA 6010C	05/24/11 12:17	VLO	
Cobalt [7440-48-4] ^	1.10	U	ug/L	1	1.10	10.0	10	EPA 6010C	05/24/11 12:17	VLO	
<b>Copper [7440-50-8] ^</b>	<b>2.62</b>	J	ug/L	1	1.60	10.0	10	EPA 6010C	05/24/11 12:17	VLO	
Lead [7439-92-1] ^	1.90	U	ug/L	1	1.90	10.0	10	EPA 6010C	05/24/11 12:17	VLO	
<b>Nickel [7440-02-0] ^</b>	<b>2.99</b>	J	ug/L	1	1.80	10.0	50	EPA 6010C	05/24/11 12:17	VLO	
Selenium [7782-49-2] ^	0.830	U	ug/L	1	0.830	1.00	10	EPA 6020A	05/27/11 12:43	VLO	
Silver [7440-22-4] ^	1.90	U	ug/L	1	1.90	10.0	10	EPA 6010C	05/24/11 12:17	VLO	
Thallium [7440-28-0] ^	0.110	U	ug/L	1	0.110	1.00	5.5	EPA 6020A	05/27/11 12:43	VLO	
<b>Vanadium [7440-62-2] ^</b>	<b>3.86</b>	J	ug/L	1	1.40	10.0	25	EPA 6010C	05/24/11 12:17	VLO	
<b>Zinc [7440-66-6] ^</b>	<b>7.80</b>	J	ug/L	1	3.80	10.0	10	EPA 6010C	05/24/11 12:17	VLO	

This report relates only to the sample as received by the laboratory, and may only be reproduced in full.



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Description: 3201-MW3R

Lab Sample ID: C105631-02

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 14:30

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

Volatile Organic Compounds by GCMS

^ - ENCO Cary certified analyte [NC 591]

Table with 11 columns: Analyte [CAS Number], Results, Flag, Units, DF, MDL, MRL, NC SWSL, Method, Analyzed, By, Notes. It lists various chemical compounds and their corresponding test results.



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Description: 3201-MW3R

Lab Sample ID: C105631-02

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 14:30

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

**Volatile Organic Compounds by GCMS**

^ - ENCO Cary certified analyte [NC 591]

<u>Analyte [CAS Number]</u>	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>NC SWSL</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Xylenes (Total) [1330-20-7] ^	2.1	U	ug/L	1	2.1	3.0	5	EPA 8260B	05/25/11 13:11	JKG	
<u>Surrogates</u>	<u>Results</u>	<u>DF</u>	<u>Spike Lvl</u>	<u>% Rec</u>	<u>% Rec Limits</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>	
4-Bromofluorobenzene	44	1	50.0	88 %	51-122	1E24016	EPA 8260B	05/25/11 13:11	JKG		
Dibromofluoromethane	47	1	50.0	94 %	68-117	1E24016	EPA 8260B	05/25/11 13:11	JKG		
Toluene-d8	45	1	50.0	89 %	69-110	1E24016	EPA 8260B	05/25/11 13:11	JKG		



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Description: 3201-MW3R

Lab Sample ID: C105631-02

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 14:30

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Antimony [7440-36-0] ^	0.220	U	ug/L	1	0.220	2.00	6	EPA 6020A	05/25/11 15:56	JDH	
Arsenic [7440-38-2] ^	2.80	U	ug/L	1	2.80	10.0	10	EPA 6010C	05/24/11 13:10	VLO	
<b>Barium [7440-39-3] ^</b>	<b>116</b>		ug/L	1	1.00	10.0	100	EPA 6010C	05/24/11 13:10	VLO	
Beryllium [7440-41-7] ^	0.100	U	ug/L	1	0.100	1.00	1	EPA 6010C	05/24/11 13:10	VLO	
Cadmium [7440-43-9] ^	0.360	U	ug/L	1	0.360	1.00	1	EPA 6010C	05/24/11 13:10	VLO	
<b>Chromium [7440-47-3] ^</b>	<b>4.85</b>	J	ug/L	1	1.00	10.0	10	EPA 6010C	05/24/11 13:10	VLO	
<b>Cobalt [7440-48-4] ^</b>	<b>1.70</b>	J	ug/L	1	1.10	10.0	10	EPA 6010C	05/24/11 13:10	VLO	
<b>Copper [7440-50-8] ^</b>	<b>2.50</b>	J	ug/L	1	1.60	10.0	10	EPA 6010C	05/24/11 13:10	VLO	
Lead [7439-92-1] ^	1.90	U	ug/L	1	1.90	10.0	10	EPA 6010C	05/24/11 13:10	VLO	
<b>Nickel [7440-02-0] ^</b>	<b>6.92</b>	J	ug/L	1	1.80	10.0	50	EPA 6010C	05/24/11 13:10	VLO	
<b>Selenium [7782-49-2] ^</b>	<b>2.87</b>	J	ug/L	1	0.830	1.00	10	EPA 6020A	05/25/11 15:56	JDH	
Silver [7440-22-4] ^	1.90	U	ug/L	1	1.90	10.0	10	EPA 6010C	05/24/11 13:10	VLO	
Thallium [7440-28-0] ^	0.110	U	ug/L	1	0.110	1.00	5.5	EPA 6020A	05/25/11 15:56	JDH	
<b>Vanadium [7440-62-2] ^</b>	<b>1.47</b>	J	ug/L	1	1.40	10.0	25	EPA 6010C	05/24/11 13:10	VLO	
Zinc [7440-66-6] ^	3.80	U	ug/L	1	3.80	10.0	10	EPA 6010C	05/24/11 13:10	VLO	

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Description: 3201-MW4R

Lab Sample ID: C105631-03

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 15:06

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

**Volatile Organic Compounds by GCMS**

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
1,1,1,2-Tetrachloroethane [630-20-6] ^	0.90	U	ug/L	1	0.90	1.0	5	EPA 8260B	05/25/11 13:40	JKG	
1,1,1-Trichloroethane [71-55-6] ^	0.65	U	ug/L	1	0.65	1.0	1	EPA 8260B	05/25/11 13:40	JKG	
1,1,2,2-Tetrachloroethane [79-34-5] ^	0.75	U	ug/L	1	0.75	1.0	3	EPA 8260B	05/25/11 13:40	JKG	
1,1,2-Trichloroethane [79-00-5] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	05/25/11 13:40	JKG	
1,1-Dichloroethane [75-34-3] ^	0.080	U	ug/L	1	0.080	1.0	5	EPA 8260B	05/25/11 13:40	JKG	
1,1-Dichloroethene [75-35-4] ^	0.60	U	ug/L	1	0.60	1.0	5	EPA 8260B	05/25/11 13:40	JKG	
1,2,3-Trichloropropane [96-18-4] ^	0.72	U	ug/L	1	0.72	1.0	1	EPA 8260B	05/25/11 13:40	JKG	
1,2-Dibromo-3-chloropropane [96-12-8] ^	0.48	U	ug/L	1	0.48	1.0	13	EPA 8260B	05/25/11 13:40	JKG	
1,2-Dibromoethane [106-93-4] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	05/25/11 13:40	JKG	
1,2-Dichlorobenzene [95-50-1] ^	0.11	U	ug/L	1	0.11	1.0	5	EPA 8260B	05/25/11 13:40	JKG	
1,2-Dichloroethane [107-06-2] ^	0.47	U	ug/L	1	0.47	1.0	1	EPA 8260B	05/25/11 13:40	JKG	
1,2-Dichloropropane [78-87-5] ^	0.59	U	ug/L	1	0.59	1.0	1	EPA 8260B	05/25/11 13:40	JKG	
1,4-Dichlorobenzene [106-46-7] ^	0.79	U	ug/L	1	0.79	1.0	1	EPA 8260B	05/25/11 13:40	JKG	
2-Butanone [78-93-3] ^	1.3	U	ug/L	1	1.3	5.0	100	EPA 8260B	05/25/11 13:40	JKG	
2-Hexanone [591-78-6] ^	0.88	U	ug/L	1	0.88	5.0	50	EPA 8260B	05/25/11 13:40	JKG	
4-Methyl-2-pentanone [108-10-1] ^	1.1	U	ug/L	1	1.1	5.0	100	EPA 8260B	05/25/11 13:40	JKG	
Acetone [67-64-1] ^	1.2	U	ug/L	1	1.2	5.0	100	EPA 8260B	05/25/11 13:40	JKG	
Acrylonitrile [107-13-1] ^	3.5	U	ug/L	1	3.5	10	200	EPA 8260B	05/25/11 13:40	JKG	
Benzene [71-43-2] ^	0.68	U	ug/L	1	0.68	1.0	1	EPA 8260B	05/25/11 13:40	JKG	
Bromochloromethane [74-97-5] ^	0.87	U	ug/L	1	0.87	1.0	3	EPA 8260B	05/25/11 13:40	JKG	
Bromodichloromethane [75-27-4] ^	0.75	U	ug/L	1	0.75	1.0	1	EPA 8260B	05/25/11 13:40	JKG	
Bromoform [75-25-2] ^	0.68	U	ug/L	1	0.68	1.0	3	EPA 8260B	05/25/11 13:40	JKG	
Bromomethane [74-83-9] ^	0.58	U	ug/L	1	0.58	1.0	10	EPA 8260B	05/25/11 13:40	JKG	
Carbon disulfide [75-15-0] ^	1.5	U	ug/L	1	1.5	5.0	100	EPA 8260B	05/25/11 13:40	JKG	
Carbon tetrachloride [56-23-5] ^	0.69	U	ug/L	1	0.69	1.0	1	EPA 8260B	05/25/11 13:40	JKG	
Chlorobenzene [108-90-7] ^	0.74	U	ug/L	1	0.74	1.0	3	EPA 8260B	05/25/11 13:40	JKG	
Chloroethane [75-00-3] ^	0.75	U	ug/L	1	0.75	1.0	10	EPA 8260B	05/25/11 13:40	JKG	
Chloroform [67-66-3] ^	0.70	U	ug/L	1	0.70	1.0	5	EPA 8260B	05/25/11 13:40	JKG	
Chloromethane [74-87-3] ^	0.55	U	ug/L	1	0.55	1.0	1	EPA 8260B	05/25/11 13:40	JKG	
cis-1,2-Dichloroethene [156-59-2] ^	0.72	U	ug/L	1	0.72	1.0	5	EPA 8260B	05/25/11 13:40	JKG	
cis-1,3-Dichloropropene [10061-01-5] ^	0.075	U	ug/L	1	0.075	1.0	1	EPA 8260B	05/25/11 13:40	JKG	
Dibromochloromethane [124-48-1] ^	0.63	U	ug/L	1	0.63	1.0	3	EPA 8260B	05/25/11 13:40	JKG	
Dibromomethane [74-95-3] ^	0.90	U	ug/L	1	0.90	1.0	10	EPA 8260B	05/25/11 13:40	JKG	
Ethylbenzene [100-41-4] ^	0.62	U	ug/L	1	0.62	1.0	1	EPA 8260B	05/25/11 13:40	JKG	
Iodomethane [74-88-4] ^	1.7	U	ug/L	1	1.7	5.0	10	EPA 8260B	05/25/11 13:40	JKG	
Methylene chloride [75-09-2] ^	0.14	U	ug/L	1	0.14	1.0	1	EPA 8260B	05/25/11 13:40	JKG	
Styrene [100-42-5] ^	0.053	U	ug/L	1	0.053	1.0	1	EPA 8260B	05/25/11 13:40	JKG	
Tetrachloroethene [127-18-4] ^	0.73	U	ug/L	1	0.73	1.0	1	EPA 8260B	05/25/11 13:40	JKG	
Toluene [108-88-3] ^	0.85	U	ug/L	1	0.85	1.0	1	EPA 8260B	05/25/11 13:40	JKG	
trans-1,2-Dichloroethene [156-60-5] ^	0.12	U	ug/L	1	0.12	1.0	5	EPA 8260B	05/25/11 13:40	JKG	
trans-1,3-Dichloropropene [10061-02-6] ^	0.50	U	ug/L	1	0.50	1.0	1	EPA 8260B	05/25/11 13:40	JKG	
trans-1,4-Dichloro-2-butene [110-57-6] ^	0.70	U	ug/L	1	0.70	1.0	100	EPA 8260B	05/25/11 13:40	JKG	
Trichloroethene [79-01-6] ^	0.72	U	ug/L	1	0.72	1.0	1	EPA 8260B	05/25/11 13:40	JKG	
Trichlorofluoromethane [75-69-4] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	05/25/11 13:40	JKG	
Vinyl acetate [108-05-4] ^	0.95	U	ug/L	1	0.95	5.0	50	EPA 8260B	05/25/11 13:40	JKG	
Vinyl chloride [75-01-4] ^	0.60	U	ug/L	1	0.60	1.0	1	EPA 8260B	05/25/11 13:40	JKG	



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Description: 3201-MW4R

Lab Sample ID: C105631-03

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 15:06

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

**Volatile Organic Compounds by GCMS**

^ - ENCO Cary certified analyte [NC 591]

<u>Analyte [CAS Number]</u>	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>NC SWSL</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Xylenes (Total) [1330-20-7] ^	2.1	U	ug/L	1	2.1	3.0	5	EPA 8260B	05/25/11 13:40	JKG	
<u>Surrogates</u>	<u>Results</u>	<u>DF</u>	<u>Spike Lvl</u>	<u>% Rec</u>	<u>% Rec Limits</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>	
4-Bromofluorobenzene	45	1	50.0	89 %	51-122	1E24016	EPA 8260B	05/25/11 13:40	JKG		
Dibromofluoromethane	46	1	50.0	93 %	68-117	1E24016	EPA 8260B	05/25/11 13:40	JKG		
Toluene-d8	46	1	50.0	92 %	69-110	1E24016	EPA 8260B	05/25/11 13:40	JKG		



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Description: 3201-MW4R

Lab Sample ID: C105631-03

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 15:06

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Antimony [7440-36-0] ^	0.220	U	ug/L	1	0.220	2.00	6	EPA 6020A	05/25/11 15:59	JDH	
Arsenic [7440-38-2] ^	2.80	U	ug/L	1	2.80	10.0	10	EPA 6010C	05/24/11 13:12	VLO	
<b>Barium [7440-39-3] ^</b>	<b>562</b>		ug/L	1	1.00	10.0	100	EPA 6010C	05/24/11 13:12	VLO	
Beryllium [7440-41-7] ^	0.100	U	ug/L	1	0.100	1.00	1	EPA 6010C	05/24/11 13:12	VLO	
Cadmium [7440-43-9] ^	0.360	U	ug/L	1	0.360	1.00	1	EPA 6010C	05/24/11 13:12	VLO	
<b>Chromium [7440-47-3] ^</b>	<b>1.37</b>	J	ug/L	1	1.00	10.0	10	EPA 6010C	05/24/11 13:12	VLO	
Cobalt [7440-48-4] ^	1.10	U	ug/L	1	1.10	10.0	10	EPA 6010C	05/24/11 13:12	VLO	
Copper [7440-50-8] ^	1.60	U	ug/L	1	1.60	10.0	10	EPA 6010C	05/24/11 13:12	VLO	
Lead [7439-92-1] ^	1.90	U	ug/L	1	1.90	10.0	10	EPA 6010C	05/24/11 13:12	VLO	
<b>Nickel [7440-02-0] ^</b>	<b>3.94</b>	J	ug/L	1	1.80	10.0	50	EPA 6010C	05/24/11 13:12	VLO	
<b>Selenium [7782-49-2] ^</b>	<b>1.76</b>	J	ug/L	1	0.830	1.00	10	EPA 6020A	05/25/11 15:59	JDH	
Silver [7440-22-4] ^	1.90	U	ug/L	1	1.90	10.0	10	EPA 6010C	05/24/11 13:12	VLO	
Thallium [7440-28-0] ^	0.110	U	ug/L	1	0.110	1.00	5.5	EPA 6020A	05/25/11 15:59	JDH	
Vanadium [7440-62-2] ^	1.40	U	ug/L	1	1.40	10.0	25	EPA 6010C	05/24/11 13:12	VLO	
Zinc [7440-66-6] ^	3.80	U	ug/L	1	3.80	10.0	10	EPA 6010C	05/24/11 13:12	VLO	

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Description: 3201-MW5

Lab Sample ID: C105631-04

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 10:45

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

## Volatile Organic Compounds by GCMS

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
1,1,1,2-Tetrachloroethane [630-20-6] ^	0.90	U	ug/L	1	0.90	1.0	5	EPA 8260B	05/27/11 22:10	jkg	
1,1,1-Trichloroethane [71-55-6] ^	0.65	U	ug/L	1	0.65	1.0	1	EPA 8260B	05/27/11 22:10	jkg	
1,1,2,2-Tetrachloroethane [79-34-5] ^	0.75	U	ug/L	1	0.75	1.0	3	EPA 8260B	05/27/11 22:10	jkg	
1,1,2-Trichloroethane [79-00-5] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	05/27/11 22:10	jkg	
1,1-Dichloroethane [75-34-3] ^	0.080	U	ug/L	1	0.080	1.0	5	EPA 8260B	05/27/11 22:10	jkg	
1,1-Dichloroethene [75-35-4] ^	0.60	U	ug/L	1	0.60	1.0	5	EPA 8260B	05/27/11 22:10	jkg	
1,2,3-Trichloropropane [96-18-4] ^	0.72	U	ug/L	1	0.72	1.0	1	EPA 8260B	05/27/11 22:10	jkg	
1,2-Dibromo-3-chloropropane [96-12-8] ^	0.48	U	ug/L	1	0.48	1.0	13	EPA 8260B	05/27/11 22:10	jkg	
1,2-Dibromoethane [106-93-4] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	05/27/11 22:10	jkg	
1,2-Dichlorobenzene [95-50-1] ^	0.11	U	ug/L	1	0.11	1.0	5	EPA 8260B	05/27/11 22:10	jkg	
1,2-Dichloroethane [107-06-2] ^	0.47	U	ug/L	1	0.47	1.0	1	EPA 8260B	05/27/11 22:10	jkg	
1,2-Dichloropropane [78-87-5] ^	0.59	U	ug/L	1	0.59	1.0	1	EPA 8260B	05/27/11 22:10	jkg	
1,4-Dichlorobenzene [106-46-7] ^	0.79	U	ug/L	1	0.79	1.0	1	EPA 8260B	05/27/11 22:10	jkg	
2-Butanone [78-93-3] ^	1.3	U	ug/L	1	1.3	5.0	100	EPA 8260B	05/27/11 22:10	jkg	
2-Hexanone [591-78-6] ^	0.88	U	ug/L	1	0.88	5.0	50	EPA 8260B	05/27/11 22:10	jkg	
4-Methyl-2-pentanone [108-10-1] ^	1.1	U	ug/L	1	1.1	5.0	100	EPA 8260B	05/27/11 22:10	jkg	
Acetone [67-64-1] ^	1.2	U	ug/L	1	1.2	5.0	100	EPA 8260B	05/27/11 22:10	jkg	
Acrylonitrile [107-13-1] ^	3.5	U	ug/L	1	3.5	10	200	EPA 8260B	05/27/11 22:10	jkg	
Benzene [71-43-2] ^	0.68	U	ug/L	1	0.68	1.0	1	EPA 8260B	05/27/11 22:10	jkg	
Bromochloromethane [74-97-5] ^	0.87	U	ug/L	1	0.87	1.0	3	EPA 8260B	05/27/11 22:10	jkg	
Bromodichloromethane [75-27-4] ^	0.75	U	ug/L	1	0.75	1.0	1	EPA 8260B	05/27/11 22:10	jkg	
Bromoform [75-25-2] ^	0.68	U	ug/L	1	0.68	1.0	3	EPA 8260B	05/27/11 22:10	jkg	
Bromomethane [74-83-9] ^	0.58	U	ug/L	1	0.58	1.0	10	EPA 8260B	05/27/11 22:10	jkg	
Carbon disulfide [75-15-0] ^	1.5	U	ug/L	1	1.5	5.0	100	EPA 8260B	05/27/11 22:10	jkg	
Carbon tetrachloride [56-23-5] ^	0.69	U	ug/L	1	0.69	1.0	1	EPA 8260B	05/27/11 22:10	jkg	
Chlorobenzene [108-90-7] ^	0.74	U	ug/L	1	0.74	1.0	3	EPA 8260B	05/27/11 22:10	jkg	
Chloroethane [75-00-3] ^	0.75	U	ug/L	1	0.75	1.0	10	EPA 8260B	05/27/11 22:10	jkg	
Chloroform [67-66-3] ^	0.70	U	ug/L	1	0.70	1.0	5	EPA 8260B	05/27/11 22:10	jkg	
Chloromethane [74-87-3] ^	0.55	U	ug/L	1	0.55	1.0	1	EPA 8260B	05/27/11 22:10	jkg	
cis-1,2-Dichloroethene [156-59-2] ^	0.72	U	ug/L	1	0.72	1.0	5	EPA 8260B	05/27/11 22:10	jkg	
cis-1,3-Dichloropropene [10061-01-5] ^	0.075	U	ug/L	1	0.075	1.0	1	EPA 8260B	05/27/11 22:10	jkg	
Dibromochloromethane [124-48-1] ^	0.63	U	ug/L	1	0.63	1.0	3	EPA 8260B	05/27/11 22:10	jkg	
Dibromomethane [74-95-3] ^	0.90	U	ug/L	1	0.90	1.0	10	EPA 8260B	05/27/11 22:10	jkg	
Ethylbenzene [100-41-4] ^	0.62	U	ug/L	1	0.62	1.0	1	EPA 8260B	05/27/11 22:10	jkg	
Iodomethane [74-88-4] ^	1.7	U	ug/L	1	1.7	5.0	10	EPA 8260B	05/27/11 22:10	jkg	
Methylene chloride [75-09-2] ^	0.14	U	ug/L	1	0.14	1.0	1	EPA 8260B	05/27/11 22:10	jkg	
Styrene [100-42-5] ^	0.053	U	ug/L	1	0.053	1.0	1	EPA 8260B	05/27/11 22:10	jkg	
Tetrachloroethene [127-18-4] ^	0.73	U	ug/L	1	0.73	1.0	1	EPA 8260B	05/27/11 22:10	jkg	
Toluene [108-88-3] ^	0.85	U	ug/L	1	0.85	1.0	1	EPA 8260B	05/27/11 22:10	jkg	
trans-1,2-Dichloroethene [156-60-5] ^	0.12	U	ug/L	1	0.12	1.0	5	EPA 8260B	05/27/11 22:10	jkg	
trans-1,3-Dichloropropene [10061-02-6] ^	0.50	U	ug/L	1	0.50	1.0	1	EPA 8260B	05/27/11 22:10	jkg	
trans-1,4-Dichloro-2-butene [110-57-6] ^	0.70	U	ug/L	1	0.70	1.0	100	EPA 8260B	05/27/11 22:10	jkg	
Trichloroethene [79-01-6] ^	0.72	U	ug/L	1	0.72	1.0	1	EPA 8260B	05/27/11 22:10	jkg	
Trichlorofluoromethane [75-69-4] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	05/27/11 22:10	jkg	
Vinyl acetate [108-05-4] ^	0.95	U	ug/L	1	0.95	5.0	50	EPA 8260B	05/27/11 22:10	jkg	
Vinyl chloride [75-01-4] ^	0.60	U	ug/L	1	0.60	1.0	1	EPA 8260B	05/27/11 22:10	jkg	



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Description: 3201-MW5

Lab Sample ID: C105631-04

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 10:45

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

**Volatile Organic Compounds by GCMS**

^ - ENCO Cary certified analyte [NC 591]

<u>Analyte [CAS Number]</u>	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>NC SWSL</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Xylenes (Total) [1330-20-7] ^	2.1	U	ug/L	1	2.1	3.0	5	EPA 8260B	05/27/11 22:10	jkg	
<u>Surrogates</u>	<u>Results</u>	<u>DF</u>	<u>Spike Lvl</u>	<u>% Rec</u>	<u>% Rec Limits</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>	
4-Bromofluorobenzene	51	1	50.0	102 %	51-122	1E27021	EPA 8260B	05/27/11 22:10	jkg		
Dibromofluoromethane	51	1	50.0	101 %	68-117	1E27021	EPA 8260B	05/27/11 22:10	jkg		
Toluene-d8	45	1	50.0	89 %	69-110	1E27021	EPA 8260B	05/27/11 22:10	jkg		



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Description: 3201-MW5

Lab Sample ID: C105631-04

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 10:45

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Antimony [7440-36-0] ^	0.220	U	ug/L	1	0.220	2.00	6	EPA 6020A	05/25/11 16:03	JDH	
Arsenic [7440-38-2] ^	2.80	U	ug/L	1	2.80	10.0	10	EPA 6010C	05/24/11 13:14	VLO	
<b>Barium [7440-39-3] ^</b>	<b>1860</b>		ug/L	1	1.00	10.0	100	EPA 6010C	05/24/11 13:14	VLO	
Beryllium [7440-41-7] ^	0.100	U	ug/L	1	0.100	1.00	1	EPA 6010C	05/24/11 13:14	VLO	
Cadmium [7440-43-9] ^	0.360	U	ug/L	1	0.360	1.00	1	EPA 6010C	05/24/11 13:14	VLO	
<b>Chromium [7440-47-3] ^</b>	<b>1.29</b>	J	ug/L	1	1.00	10.0	10	EPA 6010C	05/24/11 13:14	VLO	
Cobalt [7440-48-4] ^	1.10	U	ug/L	1	1.10	10.0	10	EPA 6010C	05/24/11 13:14	VLO	
Copper [7440-50-8] ^	1.60	U	ug/L	1	1.60	10.0	10	EPA 6010C	05/24/11 13:14	VLO	
Lead [7439-92-1] ^	1.90	U	ug/L	1	1.90	10.0	10	EPA 6010C	05/24/11 13:14	VLO	
<b>Nickel [7440-02-0] ^</b>	<b>3.31</b>	J	ug/L	1	1.80	10.0	50	EPA 6010C	05/24/11 13:14	VLO	
<b>Selenium [7782-49-2] ^</b>	<b>2.14</b>	J	ug/L	1	0.830	1.00	10	EPA 6020A	05/25/11 16:03	JDH	
Silver [7440-22-4] ^	1.90	U	ug/L	1	1.90	10.0	10	EPA 6010C	05/24/11 13:14	VLO	
Thallium [7440-28-0] ^	0.110	U	ug/L	1	0.110	1.00	5.5	EPA 6020A	05/25/11 16:03	JDH	
Vanadium [7440-62-2] ^	1.40	U	ug/L	1	1.40	10.0	25	EPA 6010C	05/24/11 13:14	VLO	
Zinc [7440-66-6] ^	3.80	U	ug/L	1	3.80	10.0	10	EPA 6010C	05/24/11 13:14	VLO	

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Description: 3201-MW9R

Lab Sample ID: C105631-05

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 10:00

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

Volatile Organic Compounds by GCMS

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
1,1,1,2-Tetrachloroethane [630-20-6] ^	0.90	U	ug/L	1	0.90	1.0	5	EPA 8260B	05/26/11 11:06	JKG	
1,1,1-Trichloroethane [71-55-6] ^	0.65	U	ug/L	1	0.65	1.0	1	EPA 8260B	05/26/11 11:06	JKG	
1,1,2,2-Tetrachloroethane [79-34-5] ^	0.75	U	ug/L	1	0.75	1.0	3	EPA 8260B	05/26/11 11:06	JKG	
1,1,2-Trichloroethane [79-00-5] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	05/26/11 11:06	JKG	
1,1-Dichloroethane [75-34-3] ^	0.080	U	ug/L	1	0.080	1.0	5	EPA 8260B	05/26/11 11:06	JKG	
1,1-Dichloroethene [75-35-4] ^	0.60	U	ug/L	1	0.60	1.0	5	EPA 8260B	05/26/11 11:06	JKG	
1,2,3-Trichloropropane [96-18-4] ^	0.72	U	ug/L	1	0.72	1.0	1	EPA 8260B	05/26/11 11:06	JKG	
1,2-Dibromo-3-chloropropane [96-12-8] ^	0.48	U	ug/L	1	0.48	1.0	13	EPA 8260B	05/26/11 11:06	JKG	
1,2-Dibromoethane [106-93-4] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	05/26/11 11:06	JKG	
1,2-Dichlorobenzene [95-50-1] ^	0.11	U	ug/L	1	0.11	1.0	5	EPA 8260B	05/26/11 11:06	JKG	
1,2-Dichloroethane [107-06-2] ^	0.47	U	ug/L	1	0.47	1.0	1	EPA 8260B	05/26/11 11:06	JKG	
1,2-Dichloropropane [78-87-5] ^	0.59	U	ug/L	1	0.59	1.0	1	EPA 8260B	05/26/11 11:06	JKG	
1,4-Dichlorobenzene [106-46-7] ^	0.79	U	ug/L	1	0.79	1.0	1	EPA 8260B	05/26/11 11:06	JKG	
2-Butanone [78-93-3] ^	1.3	U	ug/L	1	1.3	5.0	100	EPA 8260B	05/26/11 11:06	JKG	
2-Hexanone [591-78-6] ^	0.88	U	ug/L	1	0.88	5.0	50	EPA 8260B	05/26/11 11:06	JKG	
4-Methyl-2-pentanone [108-10-1] ^	1.1	U	ug/L	1	1.1	5.0	100	EPA 8260B	05/26/11 11:06	JKG	
Acetone [67-64-1] ^	1.2	U	ug/L	1	1.2	5.0	100	EPA 8260B	05/26/11 11:06	JKG	
Acrylonitrile [107-13-1] ^	3.5	U	ug/L	1	3.5	10	200	EPA 8260B	05/26/11 11:06	JKG	
Benzene [71-43-2] ^	0.68	U	ug/L	1	0.68	1.0	1	EPA 8260B	05/26/11 11:06	JKG	
Bromochloromethane [74-97-5] ^	0.87	U	ug/L	1	0.87	1.0	3	EPA 8260B	05/26/11 11:06	JKG	
Bromodichloromethane [75-27-4] ^	0.75	U	ug/L	1	0.75	1.0	1	EPA 8260B	05/26/11 11:06	JKG	
Bromoform [75-25-2] ^	0.68	U	ug/L	1	0.68	1.0	3	EPA 8260B	05/26/11 11:06	JKG	
Bromomethane [74-83-9] ^	0.58	U	ug/L	1	0.58	1.0	10	EPA 8260B	05/26/11 11:06	JKG	
Carbon disulfide [75-15-0] ^	1.5	U	ug/L	1	1.5	5.0	100	EPA 8260B	05/26/11 11:06	JKG	
Carbon tetrachloride [56-23-5] ^	0.69	U	ug/L	1	0.69	1.0	1	EPA 8260B	05/26/11 11:06	JKG	
Chlorobenzene [108-90-7] ^	0.74	U	ug/L	1	0.74	1.0	3	EPA 8260B	05/26/11 11:06	JKG	
Chloroethane [75-00-3] ^	0.75	U	ug/L	1	0.75	1.0	10	EPA 8260B	05/26/11 11:06	JKG	
Chloroform [67-66-3] ^	0.70	U	ug/L	1	0.70	1.0	5	EPA 8260B	05/26/11 11:06	JKG	
Chloromethane [74-87-3] ^	0.55	U	ug/L	1	0.55	1.0	1	EPA 8260B	05/26/11 11:06	JKG	
cis-1,2-Dichloroethene [156-59-2] ^	0.72	U	ug/L	1	0.72	1.0	5	EPA 8260B	05/26/11 11:06	JKG	
cis-1,3-Dichloropropene [10061-01-5] ^	0.075	U	ug/L	1	0.075	1.0	1	EPA 8260B	05/26/11 11:06	JKG	
Dibromochloromethane [124-48-1] ^	0.63	U	ug/L	1	0.63	1.0	3	EPA 8260B	05/26/11 11:06	JKG	
Dibromomethane [74-95-3] ^	0.90	U	ug/L	1	0.90	1.0	10	EPA 8260B	05/26/11 11:06	JKG	
Ethylbenzene [100-41-4] ^	0.62	U	ug/L	1	0.62	1.0	1	EPA 8260B	05/26/11 11:06	JKG	
Iodomethane [74-88-4] ^	1.7	U	ug/L	1	1.7	5.0	10	EPA 8260B	05/26/11 11:06	JKG	
Methylene chloride [75-09-2] ^	0.14	U	ug/L	1	0.14	1.0	1	EPA 8260B	05/26/11 11:06	JKG	
Styrene [100-42-5] ^	0.053	U	ug/L	1	0.053	1.0	1	EPA 8260B	05/26/11 11:06	JKG	
Tetrachloroethene [127-18-4] ^	0.73	U	ug/L	1	0.73	1.0	1	EPA 8260B	05/26/11 11:06	JKG	
Toluene [108-88-3] ^	0.85	U	ug/L	1	0.85	1.0	1	EPA 8260B	05/26/11 11:06	JKG	
trans-1,2-Dichloroethene [156-60-5] ^	0.12	U	ug/L	1	0.12	1.0	5	EPA 8260B	05/26/11 11:06	JKG	
trans-1,3-Dichloropropene [10061-02-6] ^	0.50	U	ug/L	1	0.50	1.0	1	EPA 8260B	05/26/11 11:06	JKG	
trans-1,4-Dichloro-2-butene [110-57-6] ^	0.70	U	ug/L	1	0.70	1.0	100	EPA 8260B	05/26/11 11:06	JKG	
Trichloroethene [79-01-6] ^	0.72	U	ug/L	1	0.72	1.0	1	EPA 8260B	05/26/11 11:06	JKG	
Trichlorofluoromethane [75-69-4] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	05/26/11 11:06	JKG	
Vinyl acetate [108-05-4] ^	0.95	U	ug/L	1	0.95	5.0	50	EPA 8260B	05/26/11 11:06	JKG	
Vinyl chloride [75-01-4] ^	0.60	U	ug/L	1	0.60	1.0	1	EPA 8260B	05/26/11 11:06	JKG	



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Description: 3201-MW9R

Lab Sample ID: C105631-05

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 10:00

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

**Volatile Organic Compounds by GCMS**

^ - ENCO Cary certified analyte [NC 591]

<u>Analyte [CAS Number]</u>	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>NC SWSL</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Xylenes (Total) [1330-20-7] ^	2.1	U	ug/L	1	2.1	3.0	5	EPA 8260B	05/26/11 11:06	JKG	
<u>Surrogates</u>	<u>Results</u>	<u>DF</u>	<u>Spike Lvl</u>	<u>% Rec</u>	<u>% Rec Limits</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>	
4-Bromofluorobenzene	44	1	50.0	88 %	51-122	1E25007	EPA 8260B	05/26/11 11:06	JKG		
Dibromofluoromethane	47	1	50.0	95 %	68-117	1E25007	EPA 8260B	05/26/11 11:06	JKG		
Toluene-d8	46	1	50.0	92 %	69-110	1E25007	EPA 8260B	05/26/11 11:06	JKG		



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Description: 3201-MW9R

Lab Sample ID: C105631-05

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 10:00

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Antimony [7440-36-0] ^	0.220	U	ug/L	1	0.220	2.00	6	EPA 6020A	05/25/11 16:07	JDH	
Arsenic [7440-38-2] ^	2.80	U	ug/L	1	2.80	10.0	10	EPA 6010C	05/24/11 13:17	VLO	
Barium [7440-39-3] ^	53.1	J	ug/L	1	1.00	10.0	100	EPA 6010C	05/24/11 13:17	VLO	
Beryllium [7440-41-7] ^	0.549	J	ug/L	1	0.100	1.00	1	EPA 6010C	05/24/11 13:17	VLO	
Cadmium [7440-43-9] ^	0.360	U	ug/L	1	0.360	1.00	1	EPA 6010C	05/24/11 13:17	VLO	
Chromium [7440-47-3] ^	1.30	J	ug/L	1	1.00	10.0	10	EPA 6010C	05/24/11 13:17	VLO	
Cobalt [7440-48-4] ^	6.93	J	ug/L	1	1.10	10.0	10	EPA 6010C	05/24/11 13:17	VLO	
Copper [7440-50-8] ^	1.99	J	ug/L	1	1.60	10.0	10	EPA 6010C	05/24/11 13:17	VLO	
Lead [7439-92-1] ^	1.90	U	ug/L	1	1.90	10.0	10	EPA 6010C	05/24/11 13:17	VLO	
Nickel [7440-02-0] ^	3.03	J	ug/L	1	1.80	10.0	50	EPA 6010C	05/24/11 13:17	VLO	
Selenium [7782-49-2] ^	0.830	U	ug/L	1	0.830	1.00	10	EPA 6020A	05/25/11 16:07	JDH	
Silver [7440-22-4] ^	1.90	U	ug/L	1	1.90	10.0	10	EPA 6010C	05/24/11 13:17	VLO	
Thallium [7440-28-0] ^	0.110	U	ug/L	1	0.110	1.00	5.5	EPA 6020A	05/25/11 16:07	JDH	
Vanadium [7440-62-2] ^	1.40	U	ug/L	1	1.40	10.0	25	EPA 6010C	05/24/11 13:17	VLO	
Zinc [7440-66-6] ^	6.26	J	ug/L	1	3.80	10.0	10	EPA 6010C	05/24/11 13:17	VLO	

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Description: 3201-MW10

Lab Sample ID: C105631-06

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 13:50

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

## Volatile Organic Compounds by GCMS

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
1,1,1,2-Tetrachloroethane [630-20-6] ^	0.90	U	ug/L	1	0.90	1.0	5	EPA 8260B	05/27/11 22:40	jkg	
1,1,1-Trichloroethane [71-55-6] ^	0.65	U	ug/L	1	0.65	1.0	1	EPA 8260B	05/27/11 22:40	jkg	
1,1,2,2-Tetrachloroethane [79-34-5] ^	0.75	U	ug/L	1	0.75	1.0	3	EPA 8260B	05/27/11 22:40	jkg	
1,1,2-Trichloroethane [79-00-5] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	05/27/11 22:40	jkg	
<b>1,1-Dichloroethane [75-34-3] ^</b>	<b>3.2</b>	J	ug/L	1	0.080	1.0	5	EPA 8260B	05/27/11 22:40	jkg	
1,1-Dichloroethene [75-35-4] ^	0.60	U	ug/L	1	0.60	1.0	5	EPA 8260B	05/27/11 22:40	jkg	
1,2,3-Trichloropropane [96-18-4] ^	0.72	U	ug/L	1	0.72	1.0	1	EPA 8260B	05/27/11 22:40	jkg	
1,2-Dibromo-3-chloropropane [96-12-8] ^	0.48	U	ug/L	1	0.48	1.0	13	EPA 8260B	05/27/11 22:40	jkg	
1,2-Dibromoethane [106-93-4] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	05/27/11 22:40	jkg	
1,2-Dichlorobenzene [95-50-1] ^	0.11	U	ug/L	1	0.11	1.0	5	EPA 8260B	05/27/11 22:40	jkg	
1,2-Dichloroethane [107-06-2] ^	0.47	U	ug/L	1	0.47	1.0	1	EPA 8260B	05/27/11 22:40	jkg	
<b>1,2-Dichloropropane [78-87-5] ^</b>	<b>2.2</b>		ug/L	1	0.59	1.0	1	EPA 8260B	05/27/11 22:40	jkg	
<b>1,4-Dichlorobenzene [106-46-7] ^</b>	<b>0.98</b>	J	ug/L	1	0.79	1.0	1	EPA 8260B	05/27/11 22:40	jkg	
2-Butanone [78-93-3] ^	1.3	U	ug/L	1	1.3	5.0	100	EPA 8260B	05/27/11 22:40	jkg	
2-Hexanone [591-78-6] ^	0.88	U	ug/L	1	0.88	5.0	50	EPA 8260B	05/27/11 22:40	jkg	
4-Methyl-2-pentanone [108-10-1] ^	1.1	U	ug/L	1	1.1	5.0	100	EPA 8260B	05/27/11 22:40	jkg	
Acetone [67-64-1] ^	1.2	U	ug/L	1	1.2	5.0	100	EPA 8260B	05/27/11 22:40	jkg	
Acrylonitrile [107-13-1] ^	3.5	U	ug/L	1	3.5	10	200	EPA 8260B	05/27/11 22:40	jkg	
<b>Benzene [71-43-2] ^</b>	<b>1.7</b>		ug/L	1	0.68	1.0	1	EPA 8260B	05/27/11 22:40	jkg	
Bromochloromethane [74-97-5] ^	0.87	U	ug/L	1	0.87	1.0	3	EPA 8260B	05/27/11 22:40	jkg	
Bromodichloromethane [75-27-4] ^	0.75	U	ug/L	1	0.75	1.0	1	EPA 8260B	05/27/11 22:40	jkg	
Bromoform [75-25-2] ^	0.68	U	ug/L	1	0.68	1.0	3	EPA 8260B	05/27/11 22:40	jkg	
Bromomethane [74-83-9] ^	0.58	U	ug/L	1	0.58	1.0	10	EPA 8260B	05/27/11 22:40	jkg	
Carbon disulfide [75-15-0] ^	1.5	U	ug/L	1	1.5	5.0	100	EPA 8260B	05/27/11 22:40	jkg	
Carbon tetrachloride [56-23-5] ^	0.69	U	ug/L	1	0.69	1.0	1	EPA 8260B	05/27/11 22:40	jkg	
Chlorobenzene [108-90-7] ^	0.74	U	ug/L	1	0.74	1.0	3	EPA 8260B	05/27/11 22:40	jkg	
Chloroethane [75-00-3] ^	0.75	U	ug/L	1	0.75	1.0	10	EPA 8260B	05/27/11 22:40	jkg	
Chloroform [67-66-3] ^	0.70	U	ug/L	1	0.70	1.0	5	EPA 8260B	05/27/11 22:40	jkg	
Chloromethane [74-87-3] ^	0.55	U	ug/L	1	0.55	1.0	1	EPA 8260B	05/27/11 22:40	jkg	
<b>cis-1,2-Dichloroethene [156-59-2] ^</b>	<b>110</b>		ug/L	1	0.72	1.0	5	EPA 8260B	05/27/11 22:40	jkg	
cis-1,3-Dichloropropene [10061-01-5] ^	0.075	U	ug/L	1	0.075	1.0	1	EPA 8260B	05/27/11 22:40	jkg	
Dibromochloromethane [124-48-1] ^	0.63	U	ug/L	1	0.63	1.0	3	EPA 8260B	05/27/11 22:40	jkg	
Dibromomethane [74-95-3] ^	0.90	U	ug/L	1	0.90	1.0	10	EPA 8260B	05/27/11 22:40	jkg	
Ethylbenzene [100-41-4] ^	0.62	U	ug/L	1	0.62	1.0	1	EPA 8260B	05/27/11 22:40	jkg	
Iodomethane [74-88-4] ^	1.7	U	ug/L	1	1.7	5.0	10	EPA 8260B	05/27/11 22:40	jkg	
Methylene chloride [75-09-2] ^	0.14	U	ug/L	1	0.14	1.0	1	EPA 8260B	05/27/11 22:40	jkg	
Styrene [100-42-5] ^	0.053	U	ug/L	1	0.053	1.0	1	EPA 8260B	05/27/11 22:40	jkg	
Tetrachloroethene [127-18-4] ^	0.73	U	ug/L	1	0.73	1.0	1	EPA 8260B	05/27/11 22:40	jkg	
Toluene [108-88-3] ^	0.85	U	ug/L	1	0.85	1.0	1	EPA 8260B	05/27/11 22:40	jkg	
<b>trans-1,2-Dichloroethene [156-60-5] ^</b>	<b>4.2</b>	J	ug/L	1	0.12	1.0	5	EPA 8260B	05/27/11 22:40	jkg	
trans-1,3-Dichloropropene [10061-02-6] ^	0.50	U	ug/L	1	0.50	1.0	1	EPA 8260B	05/27/11 22:40	jkg	
trans-1,4-Dichloro-2-butene [110-57-6] ^	0.70	U	ug/L	1	0.70	1.0	100	EPA 8260B	05/27/11 22:40	jkg	
<b>Trichloroethene [79-01-6] ^</b>	<b>12</b>		ug/L	1	0.72	1.0	1	EPA 8260B	05/27/11 22:40	jkg	
Trichlorofluoromethane [75-69-4] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	05/27/11 22:40	jkg	
Vinyl acetate [108-05-4] ^	0.95	U	ug/L	1	0.95	5.0	50	EPA 8260B	05/27/11 22:40	jkg	
<b>Vinyl chloride [75-01-4] ^</b>	<b>12</b>		ug/L	1	0.60	1.0	1	EPA 8260B	05/27/11 22:40	jkg	



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Description: 3201-MW10

Lab Sample ID: C105631-06

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 13:50

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

**Volatile Organic Compounds by GCMS**

^ - ENCO Cary certified analyte [NC 591]

<u>Analyte [CAS Number]</u>	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>NC SWSL</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Xylenes (Total) [1330-20-7] ^	2.1	U	ug/L	1	2.1	3.0	5	EPA 8260B	05/27/11 22:40	jkg	
<u>Surrogates</u>	<u>Results</u>	<u>DF</u>	<u>Spike Lvl</u>	<u>% Rec</u>	<u>% Rec Limits</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>	
4-Bromofluorobenzene	51	1	50.0	102 %	51-122	1E27021	EPA 8260B	05/27/11 22:40	jkg		
Dibromofluoromethane	51	1	50.0	102 %	68-117	1E27021	EPA 8260B	05/27/11 22:40	jkg		
Toluene-d8	45	1	50.0	91 %	69-110	1E27021	EPA 8260B	05/27/11 22:40	jkg		



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Description: 3201-MW10

Lab Sample ID: C105631-06

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 13:50

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Antimony [7440-36-0] ^	0.220	U	ug/L	1	0.220	2.00	6	EPA 6020A	05/25/11 16:18	JDH	
Arsenic [7440-38-2] ^	5.23	J	ug/L	1	2.80	10.0	10	EPA 6010C	05/24/11 13:19	VLO	
Barium [7440-39-3] ^	248		ug/L	1	1.00	10.0	100	EPA 6010C	05/24/11 13:19	VLO	
Beryllium [7440-41-7] ^	0.140	J	ug/L	1	0.100	1.00	1	EPA 6010C	05/24/11 13:19	VLO	
Cadmium [7440-43-9] ^	0.360	U	ug/L	1	0.360	1.00	1	EPA 6010C	05/24/11 13:19	VLO	
Chromium [7440-47-3] ^	4.17	J	ug/L	1	1.00	10.0	10	EPA 6010C	05/24/11 13:19	VLO	
Cobalt [7440-48-4] ^	5.31	J	ug/L	1	1.10	10.0	10	EPA 6010C	05/24/11 13:19	VLO	
Copper [7440-50-8] ^	6.08	J	ug/L	1	1.60	10.0	10	EPA 6010C	05/24/11 13:19	VLO	
Lead [7439-92-1] ^	1.90	U	ug/L	1	1.90	10.0	10	EPA 6010C	05/24/11 13:19	VLO	
Nickel [7440-02-0] ^	6.16	J	ug/L	1	1.80	10.0	50	EPA 6010C	05/24/11 13:19	VLO	
Selenium [7782-49-2] ^	3.01	J	ug/L	1	0.830	1.00	10	EPA 6020A	05/25/11 16:18	JDH	
Silver [7440-22-4] ^	1.90	U	ug/L	1	1.90	10.0	10	EPA 6010C	05/24/11 13:19	VLO	
Thallium [7440-28-0] ^	0.110	U	ug/L	1	0.110	1.00	5.5	EPA 6020A	05/25/11 16:18	JDH	
Vanadium [7440-62-2] ^	3.89	J	ug/L	1	1.40	10.0	25	EPA 6010C	05/24/11 13:19	VLO	
Zinc [7440-66-6] ^	9.03	J	ug/L	1	3.80	10.0	10	EPA 6010C	05/24/11 13:19	VLO	

This report relates only to the sample as received by the laboratory, and may only be reproduced in full.



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Description: 3201-MW11

Lab Sample ID: C105631-07

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 11:00

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Antimony [7440-36-0] ^	0.220	U	ug/L	1	0.220	2.00	6	EPA 6020A	05/25/11 16:22	JDH	
Arsenic [7440-38-2] ^	2.80	U	ug/L	1	2.80	10.0	10	EPA 6010C	05/24/11 13:22	VLO	
<b>Barium [7440-39-3] ^</b>	<b>1120</b>		ug/L	1	1.00	10.0	100	EPA 6010C	05/24/11 13:22	VLO	
Beryllium [7440-41-7] ^	0.100	U	ug/L	1	0.100	1.00	1	EPA 6010C	05/24/11 13:22	VLO	
Cadmium [7440-43-9] ^	0.360	U	ug/L	1	0.360	1.00	1	EPA 6010C	05/24/11 13:22	VLO	
<b>Chromium [7440-47-3] ^</b>	<b>1.47</b>	J	ug/L	1	1.00	10.0	10	EPA 6010C	05/24/11 13:22	VLO	
<b>Cobalt [7440-48-4] ^</b>	<b>2.16</b>	J	ug/L	1	1.10	10.0	10	EPA 6010C	05/24/11 13:22	VLO	
Copper [7440-50-8] ^	1.60	U	ug/L	1	1.60	10.0	10	EPA 6010C	05/24/11 13:22	VLO	
Lead [7439-92-1] ^	1.90	U	ug/L	1	1.90	10.0	10	EPA 6010C	05/24/11 13:22	VLO	
<b>Nickel [7440-02-0] ^</b>	<b>1.98</b>	J	ug/L	1	1.80	10.0	50	EPA 6010C	05/24/11 13:22	VLO	
<b>Selenium [7782-49-2] ^</b>	<b>1.84</b>	J	ug/L	1	0.830	1.00	10	EPA 6020A	05/25/11 16:22	JDH	
Silver [7440-22-4] ^	1.90	U	ug/L	1	1.90	10.0	10	EPA 6010C	05/24/11 13:22	VLO	
Thallium [7440-28-0] ^	0.110	U	ug/L	1	0.110	1.00	5.5	EPA 6020A	05/25/11 16:22	JDH	
Vanadium [7440-62-2] ^	1.40	U	ug/L	1	1.40	10.0	25	EPA 6010C	05/24/11 13:22	VLO	
Zinc [7440-66-6] ^	3.80	U	ug/L	1	3.80	10.0	10	EPA 6010C	05/24/11 13:22	VLO	

This report relates only to the sample as received by the laboratory, and may only be reproduced in full.



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Description: 3201-Duplicate

Lab Sample ID: C105631-08

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 08:00

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

Volatile Organic Compounds by GCMS

^ - ENCO Cary certified analyte [NC 591]

Table with columns: Analyte [CAS Number], Results, Flag, Units, DF, MDL, MRL, NC SWSL, Method, Analyzed, By, Notes. Lists various chemical compounds and their detection results.



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Description: 3201-Duplicate

Lab Sample ID: C105631-08

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 08:00

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

**Volatile Organic Compounds by GCMS**

^ - ENCO Cary certified analyte [NC 591]

<u>Analyte [CAS Number]</u>	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>NC SWSL</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Xylenes (Total) [1330-20-7] ^	2.1	U	ug/L	1	2.1	3.0	5	EPA 8260B	05/27/11 23:09	jkg	
<u>Surrogates</u>	<u>Results</u>	<u>DF</u>	<u>Spike Lvl</u>	<u>% Rec</u>	<u>% Rec Limits</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>	
4-Bromofluorobenzene	53	1	50.0	105 %	51-122	1E27021	EPA 8260B	05/27/11 23:09	jkg		
Dibromofluoromethane	51	1	50.0	102 %	68-117	1E27021	EPA 8260B	05/27/11 23:09	jkg		
Toluene-d8	45	1	50.0	89 %	69-110	1E27021	EPA 8260B	05/27/11 23:09	jkg		



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Description: 3201-Duplicate

Lab Sample ID: C105631-08

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 08:00

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Antimony [7440-36-0] ^	0.220	U	ug/L	1	0.220	2.00	6	EPA 6020A	05/25/11 16:25	JDH	
Arsenic [7440-38-2] ^	6.16	J	ug/L	1	2.80	10.0	10	EPA 6010C	05/25/11 10:45	vlo	
Barium [7440-39-3] ^	237		ug/L	1	1.00	10.0	100	EPA 6010C	05/25/11 10:45	vlo	
Beryllium [7440-41-7] ^	0.205	J	ug/L	1	0.100	1.00	1	EPA 6010C	05/25/11 10:45	vlo	
Cadmium [7440-43-9] ^	0.360	U	ug/L	1	0.360	1.00	1	EPA 6010C	05/25/11 10:45	vlo	
Chromium [7440-47-3] ^	3.73	J	ug/L	1	1.00	10.0	10	EPA 6010C	05/25/11 10:45	vlo	
Cobalt [7440-48-4] ^	5.17	J	ug/L	1	1.10	10.0	10	EPA 6010C	05/25/11 10:45	vlo	
Copper [7440-50-8] ^	4.90	J	ug/L	1	1.60	10.0	10	EPA 6010C	05/25/11 10:45	vlo	
Lead [7439-92-1] ^	1.90	U	ug/L	1	1.90	10.0	10	EPA 6010C	05/25/11 10:45	vlo	
Nickel [7440-02-0] ^	5.34	J	ug/L	1	1.80	10.0	50	EPA 6010C	05/25/11 10:45	vlo	
Selenium [7782-49-2] ^	2.49	J	ug/L	1	0.830	1.00	10	EPA 6020A	05/25/11 16:25	JDH	
Silver [7440-22-4] ^	1.90	U	ug/L	1	1.90	10.0	10	EPA 6010C	05/25/11 10:45	vlo	
Thallium [7440-28-0] ^	0.110	U	ug/L	1	0.110	1.00	5.5	EPA 6020A	05/25/11 16:25	JDH	
Vanadium [7440-62-2] ^	3.89	J	ug/L	1	1.40	10.0	25	EPA 6010C	05/25/11 10:45	vlo	
Zinc [7440-66-6] ^	9.40	J	ug/L	1	3.80	10.0	10	EPA 6010C	05/25/11 10:45	vlo	

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Description: 3201-S1

Lab Sample ID: C105631-09

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 11:03

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

Volatile Organic Compounds by GCMS

^ - ENCO Cary certified analyte [NC 591]

Table with 11 columns: Analyte [CAS Number], Results, Flag, Units, DF, MDL, MRL, NC SWSL, Method, Analyzed, By, Notes. It lists various chemical compounds and their corresponding test results.



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Description: 3201-S1

Lab Sample ID: C105631-09

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 11:03

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

**Volatile Organic Compounds by GCMS**

^ - ENCO Cary certified analyte [NC 591]

<u>Analyte [CAS Number]</u>	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>NC SWSL</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Xylenes (Total) [1330-20-7] ^	2.1	U	ug/L	1	2.1	3.0	5	EPA 8260B	05/26/11 13:04	JKG	
<u>Surrogates</u>	<u>Results</u>	<u>DF</u>	<u>Spike Lvl</u>	<u>% Rec</u>	<u>% Rec Limits</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>	
4-Bromofluorobenzene	44	1	50.0	87 %	51-122	1E25007	EPA 8260B	05/26/11 13:04	JKG		
Dibromofluoromethane	47	1	50.0	94 %	68-117	1E25007	EPA 8260B	05/26/11 13:04	JKG		
Toluene-d8	46	1	50.0	93 %	69-110	1E25007	EPA 8260B	05/26/11 13:04	JKG		



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Description: 3201-S1

Lab Sample ID: C105631-09

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 11:03

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Antimony [7440-36-0] ^	0.220	U	ug/L	1	0.220	2.00	6	EPA 6020A	05/25/11 16:29	JDH	
<b>Arsenic [7440-38-2] ^</b>	<b>5.00</b>	J	ug/L	1	2.80	10.0	10	EPA 6010C	05/25/11 10:47	vlo	
<b>Barium [7440-39-3] ^</b>	<b>108</b>		ug/L	1	1.00	10.0	100	EPA 6010C	05/25/11 10:47	vlo	
Beryllium [7440-41-7] ^	0.100	U	ug/L	1	0.100	1.00	1	EPA 6010C	05/25/11 10:47	vlo	
Cadmium [7440-43-9] ^	0.360	U	ug/L	1	0.360	1.00	1	EPA 6010C	05/25/11 10:47	vlo	
<b>Chromium [7440-47-3] ^</b>	<b>1.44</b>	J	ug/L	1	1.00	10.0	10	EPA 6010C	05/25/11 10:47	vlo	
<b>Cobalt [7440-48-4] ^</b>	<b>4.66</b>	J	ug/L	1	1.10	10.0	10	EPA 6010C	05/25/11 10:47	vlo	
<b>Copper [7440-50-8] ^</b>	<b>2.11</b>	J	ug/L	1	1.60	10.0	10	EPA 6010C	05/25/11 10:47	vlo	
Lead [7439-92-1] ^	1.90	U	ug/L	1	1.90	10.0	10	EPA 6010C	05/25/11 10:47	vlo	
<b>Nickel [7440-02-0] ^</b>	<b>4.40</b>	J	ug/L	1	1.80	10.0	50	EPA 6010C	05/25/11 10:47	vlo	
<b>Selenium [7782-49-2] ^</b>	<b>1.70</b>	J	ug/L	1	0.830	1.00	10	EPA 6020A	05/25/11 16:29	JDH	
Silver [7440-22-4] ^	1.90	U	ug/L	1	1.90	10.0	10	EPA 6010C	05/25/11 10:47	vlo	
Thallium [7440-28-0] ^	0.110	U	ug/L	1	0.110	1.00	5.5	EPA 6020A	05/25/11 16:29	JDH	
Vanadium [7440-62-2] ^	1.40	U	ug/L	1	1.40	10.0	25	EPA 6010C	05/25/11 10:47	vlo	
<b>Zinc [7440-66-6] ^</b>	<b>4.56</b>	J	ug/L	1	3.80	10.0	10	EPA 6010C	05/25/11 10:47	vlo	

This report relates only to the sample as received by the laboratory, and may only be reproduced in full.



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Description: 3201-S2

Lab Sample ID: C105631-10

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 14:00

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

Volatile Organic Compounds by GCMS

^ - ENCO Cary certified analyte [NC 591]

Table with 11 columns: Analyte [CAS Number], Results, Flag, Units, DF, MDL, MRL, NC SWSL, Method, Analyzed, By, Notes. It lists various chemical compounds and their corresponding test results.



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Description: 3201-S2

Lab Sample ID: C105631-10

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 14:00

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

**Volatile Organic Compounds by GCMS**

^ - ENCO Cary certified analyte [NC 591]

<u>Analyte [CAS Number]</u>	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>NC SWSL</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Xylenes (Total) [1330-20-7] ^	2.1	U	ug/L	1	2.1	3.0	5	EPA 8260B	05/26/11 13:33	JKG	
<u>Surrogates</u>	<u>Results</u>	<u>DF</u>	<u>Spike Lvl</u>	<u>% Rec</u>	<u>% Rec Limits</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>	
4-Bromofluorobenzene	45	1	50.0	90 %	51-122	1E25007	EPA 8260B	05/26/11 13:33	JKG		
Dibromofluoromethane	49	1	50.0	99 %	68-117	1E25007	EPA 8260B	05/26/11 13:33	JKG		
Toluene-d8	47	1	50.0	94 %	69-110	1E25007	EPA 8260B	05/26/11 13:33	JKG		



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Description: 3201-S2

Lab Sample ID: C105631-10

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 14:00

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Antimony [7440-36-0] ^	0.220	U	ug/L	1	0.220	2.00	6	EPA 6020A	05/25/11 16:33	JDH	
Arsenic [7440-38-2] ^	2.80	U	ug/L	1	2.80	10.0	10	EPA 6010C	05/25/11 10:50	vlo	
Barium [7440-39-3] ^	65.2	J	ug/L	1	1.00	10.0	100	EPA 6010C	05/25/11 10:50	vlo	
Beryllium [7440-41-7] ^	0.135	J	ug/L	1	0.100	1.00	1	EPA 6010C	05/25/11 10:50	vlo	
Cadmium [7440-43-9] ^	0.360	U	ug/L	1	0.360	1.00	1	EPA 6010C	05/25/11 10:50	vlo	
Chromium [7440-47-3] ^	2.95	J	ug/L	1	1.00	10.0	10	EPA 6010C	05/25/11 10:50	vlo	
Cobalt [7440-48-4] ^	1.75	J	ug/L	1	1.10	10.0	10	EPA 6010C	05/25/11 10:50	vlo	
Copper [7440-50-8] ^	3.75	J	ug/L	1	1.60	10.0	10	EPA 6010C	05/25/11 10:50	vlo	
Lead [7439-92-1] ^	2.90	J	ug/L	1	1.90	10.0	10	EPA 6010C	05/25/11 10:50	vlo	
Nickel [7440-02-0] ^	3.14	J	ug/L	1	1.80	10.0	50	EPA 6010C	05/25/11 10:50	vlo	
Selenium [7782-49-2] ^	1.32	J	ug/L	1	0.830	1.00	10	EPA 6020A	05/25/11 16:33	JDH	
Silver [7440-22-4] ^	1.90	U	ug/L	1	1.90	10.0	10	EPA 6010C	05/25/11 10:50	vlo	
Thallium [7440-28-0] ^	0.110	U	ug/L	1	0.110	1.00	5.5	EPA 6020A	05/25/11 16:33	JDH	
Vanadium [7440-62-2] ^	5.00	J	ug/L	1	1.40	10.0	25	EPA 6010C	05/25/11 10:50	vlo	
Zinc [7440-66-6] ^	10.1		ug/L	1	3.80	10.0	10	EPA 6010C	05/25/11 10:50	vlo	

This report relates only to the sample as received by the laboratory, and may only be reproduced in full.



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Description: 3201-S3

Lab Sample ID: C105631-11

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 15:40

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

Volatile Organic Compounds by GCMS

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
1,1,1,2-Tetrachloroethane [630-20-6] ^	0.90	U	ug/L	1	0.90	1.0	5	EPA 8260B	05/26/11 14:03	JKG	
1,1,1-Trichloroethane [71-55-6] ^	0.65	U	ug/L	1	0.65	1.0	1	EPA 8260B	05/26/11 14:03	JKG	
1,1,2,2-Tetrachloroethane [79-34-5] ^	0.75	U	ug/L	1	0.75	1.0	3	EPA 8260B	05/26/11 14:03	JKG	
1,1,2-Trichloroethane [79-00-5] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	05/26/11 14:03	JKG	
1,1-Dichloroethane [75-34-3] ^	0.080	U	ug/L	1	0.080	1.0	5	EPA 8260B	05/26/11 14:03	JKG	
1,1-Dichloroethene [75-35-4] ^	0.60	U	ug/L	1	0.60	1.0	5	EPA 8260B	05/26/11 14:03	JKG	
1,2,3-Trichloropropane [96-18-4] ^	0.72	U	ug/L	1	0.72	1.0	1	EPA 8260B	05/26/11 14:03	JKG	
1,2-Dibromo-3-chloropropane [96-12-8] ^	0.48	U	ug/L	1	0.48	1.0	13	EPA 8260B	05/26/11 14:03	JKG	
1,2-Dibromoethane [106-93-4] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	05/26/11 14:03	JKG	
1,2-Dichlorobenzene [95-50-1] ^	0.11	U	ug/L	1	0.11	1.0	5	EPA 8260B	05/26/11 14:03	JKG	
1,2-Dichloroethane [107-06-2] ^	0.47	U	ug/L	1	0.47	1.0	1	EPA 8260B	05/26/11 14:03	JKG	
1,2-Dichloropropane [78-87-5] ^	0.59	U	ug/L	1	0.59	1.0	1	EPA 8260B	05/26/11 14:03	JKG	
1,4-Dichlorobenzene [106-46-7] ^	0.79	U	ug/L	1	0.79	1.0	1	EPA 8260B	05/26/11 14:03	JKG	
2-Butanone [78-93-3] ^	1.3	U	ug/L	1	1.3	5.0	100	EPA 8260B	05/26/11 14:03	JKG	
2-Hexanone [591-78-6] ^	0.88	U	ug/L	1	0.88	5.0	50	EPA 8260B	05/26/11 14:03	JKG	
4-Methyl-2-pentanone [108-10-1] ^	1.1	U	ug/L	1	1.1	5.0	100	EPA 8260B	05/26/11 14:03	JKG	
Acetone [67-64-1] ^	1.2	U	ug/L	1	1.2	5.0	100	EPA 8260B	05/26/11 14:03	JKG	
Acrylonitrile [107-13-1] ^	3.5	U	ug/L	1	3.5	10	200	EPA 8260B	05/26/11 14:03	JKG	
Benzene [71-43-2] ^	0.68	U	ug/L	1	0.68	1.0	1	EPA 8260B	05/26/11 14:03	JKG	
Bromochloromethane [74-97-5] ^	0.87	U	ug/L	1	0.87	1.0	3	EPA 8260B	05/26/11 14:03	JKG	
Bromodichloromethane [75-27-4] ^	0.75	U	ug/L	1	0.75	1.0	1	EPA 8260B	05/26/11 14:03	JKG	
Bromoform [75-25-2] ^	0.68	U	ug/L	1	0.68	1.0	3	EPA 8260B	05/26/11 14:03	JKG	
Bromomethane [74-83-9] ^	0.58	U	ug/L	1	0.58	1.0	10	EPA 8260B	05/26/11 14:03	JKG	
Carbon disulfide [75-15-0] ^	1.5	U	ug/L	1	1.5	5.0	100	EPA 8260B	05/26/11 14:03	JKG	
Carbon tetrachloride [56-23-5] ^	0.69	U	ug/L	1	0.69	1.0	1	EPA 8260B	05/26/11 14:03	JKG	
Chlorobenzene [108-90-7] ^	0.74	U	ug/L	1	0.74	1.0	3	EPA 8260B	05/26/11 14:03	JKG	
Chloroethane [75-00-3] ^	0.75	U	ug/L	1	0.75	1.0	10	EPA 8260B	05/26/11 14:03	JKG	
Chloroform [67-66-3] ^	0.70	U	ug/L	1	0.70	1.0	5	EPA 8260B	05/26/11 14:03	JKG	
Chloromethane [74-87-3] ^	0.55	U	ug/L	1	0.55	1.0	1	EPA 8260B	05/26/11 14:03	JKG	
cis-1,2-Dichloroethene [156-59-2] ^	0.72	U	ug/L	1	0.72	1.0	5	EPA 8260B	05/26/11 14:03	JKG	
cis-1,3-Dichloropropene [10061-01-5] ^	0.075	U	ug/L	1	0.075	1.0	1	EPA 8260B	05/26/11 14:03	JKG	
Dibromochloromethane [124-48-1] ^	0.63	U	ug/L	1	0.63	1.0	3	EPA 8260B	05/26/11 14:03	JKG	
Dibromomethane [74-95-3] ^	0.90	U	ug/L	1	0.90	1.0	10	EPA 8260B	05/26/11 14:03	JKG	
Ethylbenzene [100-41-4] ^	0.62	U	ug/L	1	0.62	1.0	1	EPA 8260B	05/26/11 14:03	JKG	
Iodomethane [74-88-4] ^	1.7	U	ug/L	1	1.7	5.0	10	EPA 8260B	05/26/11 14:03	JKG	
Methylene chloride [75-09-2] ^	0.14	U	ug/L	1	0.14	1.0	1	EPA 8260B	05/26/11 14:03	JKG	
Styrene [100-42-5] ^	0.053	U	ug/L	1	0.053	1.0	1	EPA 8260B	05/26/11 14:03	JKG	
Tetrachloroethene [127-18-4] ^	0.73	U	ug/L	1	0.73	1.0	1	EPA 8260B	05/26/11 14:03	JKG	
Toluene [108-88-3] ^	0.85	U	ug/L	1	0.85	1.0	1	EPA 8260B	05/26/11 14:03	JKG	
trans-1,2-Dichloroethene [156-60-5] ^	0.12	U	ug/L	1	0.12	1.0	5	EPA 8260B	05/26/11 14:03	JKG	
trans-1,3-Dichloropropene [10061-02-6] ^	0.50	U	ug/L	1	0.50	1.0	1	EPA 8260B	05/26/11 14:03	JKG	
trans-1,4-Dichloro-2-butene [110-57-6] ^	0.70	U	ug/L	1	0.70	1.0	100	EPA 8260B	05/26/11 14:03	JKG	
Trichloroethene [79-01-6] ^	0.72	U	ug/L	1	0.72	1.0	1	EPA 8260B	05/26/11 14:03	JKG	
Trichlorofluoromethane [75-69-4] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	05/26/11 14:03	JKG	
Vinyl acetate [108-05-4] ^	0.95	U	ug/L	1	0.95	5.0	50	EPA 8260B	05/26/11 14:03	JKG	
Vinyl chloride [75-01-4] ^	0.60	U	ug/L	1	0.60	1.0	1	EPA 8260B	05/26/11 14:03	JKG	



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Description: 3201-S3

Lab Sample ID: C105631-11

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 15:40

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

**Volatile Organic Compounds by GCMS**

^ - ENCO Cary certified analyte [NC 591]

<u>Analyte [CAS Number]</u>	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>NC SWSL</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Xylenes (Total) [1330-20-7] ^	2.1	U	ug/L	1	2.1	3.0	5	EPA 8260B	05/26/11 14:03	JKG	
<u>Surrogates</u>	<u>Results</u>	<u>DF</u>	<u>Spike Lvl</u>	<u>% Rec</u>	<u>% Rec Limits</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>	
4-Bromofluorobenzene	44	1	50.0	88 %	51-122	1E25007	EPA 8260B	05/26/11 14:03	JKG		
Dibromofluoromethane	47	1	50.0	95 %	68-117	1E25007	EPA 8260B	05/26/11 14:03	JKG		
Toluene-d8	47	1	50.0	93 %	69-110	1E25007	EPA 8260B	05/26/11 14:03	JKG		



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Description: 3201-S3

Lab Sample ID: C105631-11

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 15:40

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
<b>Antimony [7440-36-0]</b> ^	<b>0.292</b>	J	ug/L	1	0.220	2.00	6	EPA 6020A	05/25/11 16:37	JDH	
Arsenic [7440-38-2] ^	2.80	U	ug/L	1	2.80	10.0	10	EPA 6010C	05/25/11 10:52	vlo	
<b>Barium [7440-39-3]</b> ^	<b>15.5</b>	J	ug/L	1	1.00	10.0	100	EPA 6010C	05/25/11 10:52	vlo	
Beryllium [7440-41-7] ^	0.100	U	ug/L	1	0.100	1.00	1	EPA 6010C	05/25/11 10:52	vlo	
Cadmium [7440-43-9] ^	0.360	U	ug/L	1	0.360	1.00	1	EPA 6010C	05/25/11 10:52	vlo	
Chromium [7440-47-3] ^	1.00	U	ug/L	1	1.00	10.0	10	EPA 6010C	05/25/11 10:52	vlo	
<b>Cobalt [7440-48-4]</b> ^	<b>1.22</b>	J	ug/L	1	1.10	10.0	10	EPA 6010C	05/25/11 10:52	vlo	
<b>Copper [7440-50-8]</b> ^	<b>1.93</b>	J	ug/L	1	1.60	10.0	10	EPA 6010C	05/25/11 10:52	vlo	
Lead [7439-92-1] ^	1.90	U	ug/L	1	1.90	10.0	10	EPA 6010C	05/25/11 10:52	vlo	
<b>Nickel [7440-02-0]</b> ^	<b>2.05</b>	J	ug/L	1	1.80	10.0	50	EPA 6010C	05/25/11 10:52	vlo	
<b>Selenium [7782-49-2]</b> ^	<b>1.81</b>	J	ug/L	1	0.830	1.00	10	EPA 6020A	05/25/11 16:37	JDH	
Silver [7440-22-4] ^	1.90	U	ug/L	1	1.90	10.0	10	EPA 6010C	05/25/11 10:52	vlo	
Thallium [7440-28-0] ^	0.110	U	ug/L	1	0.110	1.00	5.5	EPA 6020A	05/25/11 16:37	JDH	
<b>Vanadium [7440-62-2]</b> ^	<b>2.84</b>	J	ug/L	1	1.40	10.0	25	EPA 6010C	05/25/11 10:52	vlo	
<b>Zinc [7440-66-6]</b> ^	<b>36.8</b>		ug/L	1	3.80	10.0	10	EPA 6010C	05/25/11 10:52	vlo	

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Description: 3201-S4

Lab Sample ID: C105631-12

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 15:25

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

**Volatile Organic Compounds by GCMS**

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
1,1,1,2-Tetrachloroethane [630-20-6] ^	0.90	U	ug/L	1	0.90	1.0	5	EPA 8260B	05/26/11 14:32	JKG	
1,1,1-Trichloroethane [71-55-6] ^	0.65	U	ug/L	1	0.65	1.0	1	EPA 8260B	05/26/11 14:32	JKG	
1,1,2,2-Tetrachloroethane [79-34-5] ^	0.75	U	ug/L	1	0.75	1.0	3	EPA 8260B	05/26/11 14:32	JKG	
1,1,2-Trichloroethane [79-00-5] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	05/26/11 14:32	JKG	
1,1-Dichloroethane [75-34-3] ^	0.080	U	ug/L	1	0.080	1.0	5	EPA 8260B	05/26/11 14:32	JKG	
1,1-Dichloroethene [75-35-4] ^	0.60	U	ug/L	1	0.60	1.0	5	EPA 8260B	05/26/11 14:32	JKG	
1,2,3-Trichloropropane [96-18-4] ^	0.72	U	ug/L	1	0.72	1.0	1	EPA 8260B	05/26/11 14:32	JKG	
1,2-Dibromo-3-chloropropane [96-12-8] ^	0.48	U	ug/L	1	0.48	1.0	13	EPA 8260B	05/26/11 14:32	JKG	
1,2-Dibromoethane [106-93-4] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	05/26/11 14:32	JKG	
1,2-Dichlorobenzene [95-50-1] ^	0.11	U	ug/L	1	0.11	1.0	5	EPA 8260B	05/26/11 14:32	JKG	
1,2-Dichloroethane [107-06-2] ^	0.47	U	ug/L	1	0.47	1.0	1	EPA 8260B	05/26/11 14:32	JKG	
1,2-Dichloropropane [78-87-5] ^	0.59	U	ug/L	1	0.59	1.0	1	EPA 8260B	05/26/11 14:32	JKG	
1,4-Dichlorobenzene [106-46-7] ^	0.79	U	ug/L	1	0.79	1.0	1	EPA 8260B	05/26/11 14:32	JKG	
2-Butanone [78-93-3] ^	1.3	U	ug/L	1	1.3	5.0	100	EPA 8260B	05/26/11 14:32	JKG	
2-Hexanone [591-78-6] ^	0.88	U	ug/L	1	0.88	5.0	50	EPA 8260B	05/26/11 14:32	JKG	
4-Methyl-2-pentanone [108-10-1] ^	1.1	U	ug/L	1	1.1	5.0	100	EPA 8260B	05/26/11 14:32	JKG	
Acetone [67-64-1] ^	1.2	U	ug/L	1	1.2	5.0	100	EPA 8260B	05/26/11 14:32	JKG	
Acrylonitrile [107-13-1] ^	3.5	U	ug/L	1	3.5	10	200	EPA 8260B	05/26/11 14:32	JKG	
Benzene [71-43-2] ^	0.68	U	ug/L	1	0.68	1.0	1	EPA 8260B	05/26/11 14:32	JKG	
Bromochloromethane [74-97-5] ^	0.87	U	ug/L	1	0.87	1.0	3	EPA 8260B	05/26/11 14:32	JKG	
Bromodichloromethane [75-27-4] ^	0.75	U	ug/L	1	0.75	1.0	1	EPA 8260B	05/26/11 14:32	JKG	
Bromoform [75-25-2] ^	0.68	U	ug/L	1	0.68	1.0	3	EPA 8260B	05/26/11 14:32	JKG	
Bromomethane [74-83-9] ^	0.58	U	ug/L	1	0.58	1.0	10	EPA 8260B	05/26/11 14:32	JKG	
Carbon disulfide [75-15-0] ^	1.5	U	ug/L	1	1.5	5.0	100	EPA 8260B	05/26/11 14:32	JKG	
Carbon tetrachloride [56-23-5] ^	0.69	U	ug/L	1	0.69	1.0	1	EPA 8260B	05/26/11 14:32	JKG	
Chlorobenzene [108-90-7] ^	0.74	U	ug/L	1	0.74	1.0	3	EPA 8260B	05/26/11 14:32	JKG	
Chloroethane [75-00-3] ^	0.75	U	ug/L	1	0.75	1.0	10	EPA 8260B	05/26/11 14:32	JKG	
Chloroform [67-66-3] ^	0.70	U	ug/L	1	0.70	1.0	5	EPA 8260B	05/26/11 14:32	JKG	
Chloromethane [74-87-3] ^	0.55	U	ug/L	1	0.55	1.0	1	EPA 8260B	05/26/11 14:32	JKG	
cis-1,2-Dichloroethene [156-59-2] ^	0.72	U	ug/L	1	0.72	1.0	5	EPA 8260B	05/26/11 14:32	JKG	
cis-1,3-Dichloropropene [10061-01-5] ^	0.075	U	ug/L	1	0.075	1.0	1	EPA 8260B	05/26/11 14:32	JKG	
Dibromochloromethane [124-48-1] ^	0.63	U	ug/L	1	0.63	1.0	3	EPA 8260B	05/26/11 14:32	JKG	
Dibromomethane [74-95-3] ^	0.90	U	ug/L	1	0.90	1.0	10	EPA 8260B	05/26/11 14:32	JKG	
Ethylbenzene [100-41-4] ^	0.62	U	ug/L	1	0.62	1.0	1	EPA 8260B	05/26/11 14:32	JKG	
Iodomethane [74-88-4] ^	1.7	U	ug/L	1	1.7	5.0	10	EPA 8260B	05/26/11 14:32	JKG	
Methylene chloride [75-09-2] ^	0.14	U	ug/L	1	0.14	1.0	1	EPA 8260B	05/26/11 14:32	JKG	
Styrene [100-42-5] ^	0.053	U	ug/L	1	0.053	1.0	1	EPA 8260B	05/26/11 14:32	JKG	
Tetrachloroethene [127-18-4] ^	0.73	U	ug/L	1	0.73	1.0	1	EPA 8260B	05/26/11 14:32	JKG	
Toluene [108-88-3] ^	0.85	U	ug/L	1	0.85	1.0	1	EPA 8260B	05/26/11 14:32	JKG	
trans-1,2-Dichloroethene [156-60-5] ^	0.12	U	ug/L	1	0.12	1.0	5	EPA 8260B	05/26/11 14:32	JKG	
trans-1,3-Dichloropropene [10061-02-6] ^	0.50	U	ug/L	1	0.50	1.0	1	EPA 8260B	05/26/11 14:32	JKG	
trans-1,4-Dichloro-2-butene [110-57-6] ^	0.70	U	ug/L	1	0.70	1.0	100	EPA 8260B	05/26/11 14:32	JKG	
Trichloroethene [79-01-6] ^	0.72	U	ug/L	1	0.72	1.0	1	EPA 8260B	05/26/11 14:32	JKG	
Trichlorofluoromethane [75-69-4] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	05/26/11 14:32	JKG	
Vinyl acetate [108-05-4] ^	0.95	U	ug/L	1	0.95	5.0	50	EPA 8260B	05/26/11 14:32	JKG	
Vinyl chloride [75-01-4] ^	0.60	U	ug/L	1	0.60	1.0	1	EPA 8260B	05/26/11 14:32	JKG	



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Description: 3201-S4

Lab Sample ID: C105631-12

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 15:25

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

**Volatile Organic Compounds by GCMS**

^ - ENCO Cary certified analyte [NC 591]

<u>Analyte [CAS Number]</u>	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>NC SWSL</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Xylenes (Total) [1330-20-7] ^	2.1	U	ug/L	1	2.1	3.0	5	EPA 8260B	05/26/11 14:32	JKG	
<u>Surrogates</u>	<u>Results</u>	<u>DF</u>	<u>Spike Lvl</u>	<u>% Rec</u>	<u>% Rec Limits</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>	
4-Bromofluorobenzene	45	1	50.0	90 %	51-122	1E25007	EPA 8260B	05/26/11 14:32	JKG		
Dibromofluoromethane	49	1	50.0	98 %	68-117	1E25007	EPA 8260B	05/26/11 14:32	JKG		
Toluene-d8	47	1	50.0	95 %	69-110	1E25007	EPA 8260B	05/26/11 14:32	JKG		



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Description: 3201-S4

Lab Sample ID: C105631-12

Received: 05/20/11 09:15

Matrix: Ground Water

Sampled: 05/19/11 15:25

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
<b>Antimony [7440-36-0]</b> ^	<b>0.271</b>	J	ug/L	1	0.220	2.00	6	EPA 6020A	05/25/11 16:40	JDH	
Arsenic [7440-38-2] ^	2.80	U	ug/L	1	2.80	10.0	10	EPA 6010C	05/25/11 10:54	vlo	
<b>Barium [7440-39-3]</b> ^	<b>14.3</b>	J	ug/L	1	1.00	10.0	100	EPA 6010C	05/25/11 10:54	vlo	
Beryllium [7440-41-7] ^	0.100	U	ug/L	1	0.100	1.00	1	EPA 6010C	05/25/11 10:54	vlo	
Cadmium [7440-43-9] ^	0.360	U	ug/L	1	0.360	1.00	1	EPA 6010C	05/25/11 10:54	vlo	
Chromium [7440-47-3] ^	1.00	U	ug/L	1	1.00	10.0	10	EPA 6010C	05/25/11 10:54	vlo	
Cobalt [7440-48-4] ^	1.10	U	ug/L	1	1.10	10.0	10	EPA 6010C	05/25/11 10:54	vlo	
<b>Copper [7440-50-8]</b> ^	<b>1.60</b>	J	ug/L	1	1.60	10.0	10	EPA 6010C	05/25/11 10:54	vlo	
<b>Lead [7439-92-1]</b> ^	<b>2.31</b>	J	ug/L	1	1.90	10.0	10	EPA 6010C	05/25/11 10:54	vlo	
<b>Nickel [7440-02-0]</b> ^	<b>2.11</b>	J	ug/L	1	1.80	10.0	50	EPA 6010C	05/25/11 10:54	vlo	
<b>Selenium [7782-49-2]</b> ^	<b>1.88</b>	J	ug/L	1	0.830	1.00	10	EPA 6020A	05/25/11 16:40	JDH	
Silver [7440-22-4] ^	1.90	U	ug/L	1	1.90	10.0	10	EPA 6010C	05/25/11 10:54	vlo	
Thallium [7440-28-0] ^	0.110	U	ug/L	1	0.110	1.00	5.5	EPA 6020A	05/25/11 16:40	JDH	
<b>Vanadium [7440-62-2]</b> ^	<b>2.97</b>	J	ug/L	1	1.40	10.0	25	EPA 6010C	05/25/11 10:54	vlo	
<b>Zinc [7440-66-6]</b> ^	<b>37.1</b>		ug/L	1	3.80	10.0	10	EPA 6010C	05/25/11 10:54	vlo	

This report relates only to the sample as received by the laboratory, and may only be reproduced in full.



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Description: 3201-Equipment Blank

Lab Sample ID: C105631-13

Received: 05/20/11 09:15

Matrix: Water

Sampled: 05/19/11 18:00

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

## Volatile Organic Compounds by GCMS

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
1,1,1,2-Tetrachloroethane [630-20-6] ^	0.90	U	ug/L	1	0.90	1.0	5	EPA 8260B	05/26/11 15:01	JKG	
1,1,1-Trichloroethane [71-55-6] ^	0.65	U	ug/L	1	0.65	1.0	1	EPA 8260B	05/26/11 15:01	JKG	
1,1,2,2-Tetrachloroethane [79-34-5] ^	0.75	U	ug/L	1	0.75	1.0	3	EPA 8260B	05/26/11 15:01	JKG	
1,1,2-Trichloroethane [79-00-5] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	05/26/11 15:01	JKG	
1,1-Dichloroethane [75-34-3] ^	0.080	U	ug/L	1	0.080	1.0	5	EPA 8260B	05/26/11 15:01	JKG	
1,1-Dichloroethene [75-35-4] ^	0.60	U	ug/L	1	0.60	1.0	5	EPA 8260B	05/26/11 15:01	JKG	
1,2,3-Trichloropropane [96-18-4] ^	0.72	U	ug/L	1	0.72	1.0	1	EPA 8260B	05/26/11 15:01	JKG	
1,2-Dibromo-3-chloropropane [96-12-8] ^	0.48	U	ug/L	1	0.48	1.0	13	EPA 8260B	05/26/11 15:01	JKG	
1,2-Dibromoethane [106-93-4] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	05/26/11 15:01	JKG	
1,2-Dichlorobenzene [95-50-1] ^	0.11	U	ug/L	1	0.11	1.0	5	EPA 8260B	05/26/11 15:01	JKG	
1,2-Dichloroethane [107-06-2] ^	0.47	U	ug/L	1	0.47	1.0	1	EPA 8260B	05/26/11 15:01	JKG	
1,2-Dichloropropane [78-87-5] ^	0.59	U	ug/L	1	0.59	1.0	1	EPA 8260B	05/26/11 15:01	JKG	
1,4-Dichlorobenzene [106-46-7] ^	0.79	U	ug/L	1	0.79	1.0	1	EPA 8260B	05/26/11 15:01	JKG	
2-Butanone [78-93-3] ^	1.3	U	ug/L	1	1.3	5.0	100	EPA 8260B	05/26/11 15:01	JKG	
2-Hexanone [591-78-6] ^	0.88	U	ug/L	1	0.88	5.0	50	EPA 8260B	05/26/11 15:01	JKG	
4-Methyl-2-pentanone [108-10-1] ^	1.1	U	ug/L	1	1.1	5.0	100	EPA 8260B	05/26/11 15:01	JKG	
Acetone [67-64-1] ^	1.2	U	ug/L	1	1.2	5.0	100	EPA 8260B	05/26/11 15:01	JKG	
Acrylonitrile [107-13-1] ^	3.5	U	ug/L	1	3.5	10	200	EPA 8260B	05/26/11 15:01	JKG	
Benzene [71-43-2] ^	0.68	U	ug/L	1	0.68	1.0	1	EPA 8260B	05/26/11 15:01	JKG	
Bromochloromethane [74-97-5] ^	0.87	U	ug/L	1	0.87	1.0	3	EPA 8260B	05/26/11 15:01	JKG	
Bromodichloromethane [75-27-4] ^	0.75	U	ug/L	1	0.75	1.0	1	EPA 8260B	05/26/11 15:01	JKG	
Bromoform [75-25-2] ^	0.68	U	ug/L	1	0.68	1.0	3	EPA 8260B	05/26/11 15:01	JKG	
Bromomethane [74-83-9] ^	0.58	U	ug/L	1	0.58	1.0	10	EPA 8260B	05/26/11 15:01	JKG	
Carbon disulfide [75-15-0] ^	1.5	U	ug/L	1	1.5	5.0	100	EPA 8260B	05/26/11 15:01	JKG	
Carbon tetrachloride [56-23-5] ^	0.69	U	ug/L	1	0.69	1.0	1	EPA 8260B	05/26/11 15:01	JKG	
Chlorobenzene [108-90-7] ^	0.74	U	ug/L	1	0.74	1.0	3	EPA 8260B	05/26/11 15:01	JKG	
Chloroethane [75-00-3] ^	0.75	U	ug/L	1	0.75	1.0	10	EPA 8260B	05/26/11 15:01	JKG	
Chloroform [67-66-3] ^	0.70	U	ug/L	1	0.70	1.0	5	EPA 8260B	05/26/11 15:01	JKG	
Chloromethane [74-87-3] ^	0.55	U	ug/L	1	0.55	1.0	1	EPA 8260B	05/26/11 15:01	JKG	
cis-1,2-Dichloroethene [156-59-2] ^	0.72	U	ug/L	1	0.72	1.0	5	EPA 8260B	05/26/11 15:01	JKG	
cis-1,3-Dichloropropene [10061-01-5] ^	0.075	U	ug/L	1	0.075	1.0	1	EPA 8260B	05/26/11 15:01	JKG	
Dibromochloromethane [124-48-1] ^	0.63	U	ug/L	1	0.63	1.0	3	EPA 8260B	05/26/11 15:01	JKG	
Dibromomethane [74-95-3] ^	0.90	U	ug/L	1	0.90	1.0	10	EPA 8260B	05/26/11 15:01	JKG	
Ethylbenzene [100-41-4] ^	0.62	U	ug/L	1	0.62	1.0	1	EPA 8260B	05/26/11 15:01	JKG	
Iodomethane [74-88-4] ^	1.7	U	ug/L	1	1.7	5.0	10	EPA 8260B	05/26/11 15:01	JKG	
Methylene chloride [75-09-2] ^	0.14	U	ug/L	1	0.14	1.0	1	EPA 8260B	05/26/11 15:01	JKG	
Styrene [100-42-5] ^	0.053	U	ug/L	1	0.053	1.0	1	EPA 8260B	05/26/11 15:01	JKG	
Tetrachloroethene [127-18-4] ^	0.73	U	ug/L	1	0.73	1.0	1	EPA 8260B	05/26/11 15:01	JKG	
Toluene [108-88-3] ^	0.85	U	ug/L	1	0.85	1.0	1	EPA 8260B	05/26/11 15:01	JKG	
trans-1,2-Dichloroethene [156-60-5] ^	0.12	U	ug/L	1	0.12	1.0	5	EPA 8260B	05/26/11 15:01	JKG	
trans-1,3-Dichloropropene [10061-02-6] ^	0.50	U	ug/L	1	0.50	1.0	1	EPA 8260B	05/26/11 15:01	JKG	
trans-1,4-Dichloro-2-butene [110-57-6] ^	0.70	U	ug/L	1	0.70	1.0	100	EPA 8260B	05/26/11 15:01	JKG	
Trichloroethene [79-01-6] ^	0.72	U	ug/L	1	0.72	1.0	1	EPA 8260B	05/26/11 15:01	JKG	
Trichlorofluoromethane [75-69-4] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	05/26/11 15:01	JKG	
Vinyl acetate [108-05-4] ^	0.95	U	ug/L	1	0.95	5.0	50	EPA 8260B	05/26/11 15:01	JKG	
Vinyl chloride [75-01-4] ^	0.60	U	ug/L	1	0.60	1.0	1	EPA 8260B	05/26/11 15:01	JKG	



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Description: 3201-Equipment Blank

Lab Sample ID: C105631-13

Received: 05/20/11 09:15

Matrix: Water

Sampled: 05/19/11 18:00

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

**Volatile Organic Compounds by GCMS**

^ - ENCO Cary certified analyte [NC 591]

<u>Analyte [CAS Number]</u>	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>NC SWSL</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Xylenes (Total) [1330-20-7] ^	2.1	U	ug/L	1	2.1	3.0	5	EPA 8260B	05/26/11 15:01	JKG	
<u>Surrogates</u>	<u>Results</u>	<u>DF</u>	<u>Spike Lvl</u>	<u>% Rec</u>	<u>% Rec Limits</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>	
4-Bromofluorobenzene	44	1	50.0	87 %	51-122	1E25007	EPA 8260B	05/26/11 15:01	JKG		
Dibromofluoromethane	49	1	50.0	98 %	68-117	1E25007	EPA 8260B	05/26/11 15:01	JKG		
Toluene-d8	45	1	50.0	91 %	69-110	1E25007	EPA 8260B	05/26/11 15:01	JKG		



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Description: 3201-Equipment Blank

Lab Sample ID: C105631-13

Received: 05/20/11 09:15

Matrix: Water

Sampled: 05/19/11 18:00

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: Gerald Paul

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Antimony [7440-36-0] ^	0.220	U	ug/L	1	0.220	2.00	6	EPA 6020A	05/25/11 16:44	JDH	
Arsenic [7440-38-2] ^	2.80	U	ug/L	1	2.80	10.0	10	EPA 6010C	05/25/11 10:56	vlo	
<b>Barium [7440-39-3] ^</b>	<b>1.14</b>	<b>J</b>	ug/L	1	1.00	10.0	100	EPA 6010C	05/25/11 10:56	vlo	
Beryllium [7440-41-7] ^	0.100	U	ug/L	1	0.100	1.00	1	EPA 6010C	05/25/11 10:56	vlo	
Cadmium [7440-43-9] ^	0.360	U	ug/L	1	0.360	1.00	1	EPA 6010C	05/25/11 10:56	vlo	
Chromium [7440-47-3] ^	1.00	U	ug/L	1	1.00	10.0	10	EPA 6010C	05/25/11 10:56	vlo	
Cobalt [7440-48-4] ^	1.10	U	ug/L	1	1.10	10.0	10	EPA 6010C	05/25/11 10:56	vlo	
Copper [7440-50-8] ^	1.60	U	ug/L	1	1.60	10.0	10	EPA 6010C	05/25/11 10:56	vlo	
Lead [7439-92-1] ^	1.90	U	ug/L	1	1.90	10.0	10	EPA 6010C	05/25/11 10:56	vlo	
Nickel [7440-02-0] ^	1.80	U	ug/L	1	1.80	10.0	50	EPA 6010C	05/25/11 10:56	vlo	
Selenium [7782-49-2] ^	0.830	U	ug/L	1	0.830	1.00	10	EPA 6020A	05/25/11 16:44	JDH	
Silver [7440-22-4] ^	1.90	U	ug/L	1	1.90	10.0	10	EPA 6010C	05/25/11 10:56	vlo	
Thallium [7440-28-0] ^	0.110	U	ug/L	1	0.110	1.00	5.5	EPA 6020A	05/25/11 16:44	JDH	
Vanadium [7440-62-2] ^	1.40	U	ug/L	1	1.40	10.0	25	EPA 6010C	05/25/11 10:56	vlo	
<b>Zinc [7440-66-6] ^</b>	<b>4.26</b>	<b>J</b>	ug/L	1	3.80	10.0	10	EPA 6010C	05/25/11 10:56	vlo	

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Description: 3201-Trip Blank

Lab Sample ID: C105631-14

Received: 05/20/11 09:15

Matrix: Water

Sampled: 05/19/11 08:00

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: ENCO

Volatile Organic Compounds by GCMS

^ - ENCO Cary certified analyte [NC 591]

Table with 11 columns: Analyte [CAS Number], Results, Flag, Units, DF, MDL, MRL, NC SWSL, Method, Analyzed, By, Notes. It lists various chemical compounds and their corresponding test results.



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Description: 3201-Trip Blank

Lab Sample ID: C105631-14

Received: 05/20/11 09:15

Matrix: Water

Sampled: 05/19/11 08:00

Work Order: C105631

Project: City of Durham Closed MSWLF

Sampled By: ENCO

**Volatile Organic Compounds by GCMS**

^ - ENCO Cary certified analyte [NC 591]

<u>Analyte [CAS Number]</u>	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>NC SWSL</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Xylenes (Total) [1330-20-7] ^	2.1	U	ug/L	1	2.1	3.0	5	EPA 8260B	05/27/11 23:39	jkg	
<u>Surrogates</u>	<u>Results</u>	<u>DF</u>	<u>Spike Lvl</u>	<u>% Rec</u>	<u>% Rec Limits</u>	<u>Batch</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>	
4-Bromofluorobenzene	53	1	50.0	105 %	51-122	1E27021	EPA 8260B	05/27/11 23:39	jkg		
Dibromofluoromethane	51	1	50.0	103 %	68-117	1E27021	EPA 8260B	05/27/11 23:39	jkg		
Toluene-d8	45	1	50.0	90 %	69-110	1E27021	EPA 8260B	05/27/11 23:39	jkg		

This report relates only to the sample as received by the laboratory, and may only be reproduced in full.



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**QUALITY CONTROL****Volatile Organic Compounds by GCMS - Quality Control**

Batch 1E24016 - EPA 5030B\_MS

Blank (1E24016-BLK1)

Prepared: 05/24/2011 10:33 Analyzed: 05/25/2011 03:54

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1,2-Tetrachloroethane	0.90	U	1.0	ug/L							
1,1,1-Trichloroethane	0.65	U	1.0	ug/L							
1,1,2,2-Tetrachloroethane	0.75	U	1.0	ug/L							
1,1,2-Trichloroethane	0.66	U	1.0	ug/L							
1,1-Dichloroethane	0.080	U	1.0	ug/L							
1,1-Dichloroethene	0.60	U	1.0	ug/L							
1,2,3-Trichloropropane	0.72	U	1.0	ug/L							
1,2-Dibromo-3-chloropropane	0.48	U	1.0	ug/L							
1,2-Dibromoethane	0.66	U	1.0	ug/L							
1,2-Dichlorobenzene	0.11	U	1.0	ug/L							
1,2-Dichloroethane	0.47	U	1.0	ug/L							
1,2-Dichloropropane	0.59	U	1.0	ug/L							
1,4-Dichlorobenzene	0.79	U	1.0	ug/L							
2-Butanone	1.3	U	5.0	ug/L							
2-Hexanone	0.88	U	5.0	ug/L							
4-Methyl-2-pentanone	1.1	U	5.0	ug/L							
Acetone	1.2	U	5.0	ug/L							
Acrylonitrile	3.5	U	10	ug/L							
Benzene	0.68	U	1.0	ug/L							
Bromochloromethane	0.87	U	1.0	ug/L							
Bromodichloromethane	0.75	U	1.0	ug/L							
Bromoform	0.68	U	1.0	ug/L							
Bromomethane	0.58	U	1.0	ug/L							
Carbon disulfide	1.5	U	5.0	ug/L							
Carbon tetrachloride	0.69	U	1.0	ug/L							
Chlorobenzene	0.74	U	1.0	ug/L							
Chloroethane	0.75	U	1.0	ug/L							
Chloroform	0.70	U	1.0	ug/L							
Chloromethane	0.55	U	1.0	ug/L							
cis-1,2-Dichloroethene	0.72	U	1.0	ug/L							
cis-1,3-Dichloropropene	0.075	U	1.0	ug/L							
Dibromochloromethane	0.63	U	1.0	ug/L							
Dibromomethane	0.90	U	1.0	ug/L							
Ethylbenzene	0.62	U	1.0	ug/L							
Iodomethane	1.7	U	5.0	ug/L							
Methylene chloride	0.14	U	1.0	ug/L							
Styrene	0.053	U	1.0	ug/L							
Tetrachloroethene	0.73	U	1.0	ug/L							
Toluene	0.85	U	1.0	ug/L							
trans-1,2-Dichloroethene	0.12	U	1.0	ug/L							
trans-1,3-Dichloropropene	0.50	U	1.0	ug/L							
trans-1,4-Dichloro-2-butene	0.70	U	1.0	ug/L							
Trichloroethene	0.72	U	1.0	ug/L							
Trichlorofluoromethane	0.66	U	1.0	ug/L							
Vinyl acetate	0.95	U	5.0	ug/L							
Vinyl chloride	0.60	U	1.0	ug/L							
Xylenes (Total)	2.1	U	3.0	ug/L							
Surrogate: 4-Bromofluorobenzene	45			ug/L	50.0		89	51-122			



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**QUALITY CONTROL****Volatile Organic Compounds by GCMS - Quality Control**

Batch 1E24016 - EPA 5030B\_MS

**Blank (1E24016-BLK1) Continued**

Prepared: 05/24/2011 10:33 Analyzed: 05/25/2011 03:54

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Surrogate: Dibromofluoromethane	45			ug/L	50.0		89	68-117			
Surrogate: Toluene-d8	44			ug/L	50.0		89	69-110			

**LCS (1E24016-BS1)**

Prepared: 05/24/2011 10:33 Analyzed: 05/25/2011 04:23

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1-Dichloroethene	18		1.0	ug/L	20.0		92	75-133			
Benzene	20		1.0	ug/L	20.0		98	81-134			
Chlorobenzene	19		1.0	ug/L	20.0		96	83-117			
Toluene	18		1.0	ug/L	20.0		91	71-118			
Trichloroethene	18		1.0	ug/L	20.0		90	75-115			

**Matrix Spike (1E24016-MS1)**

Prepared: 05/24/2011 10:33 Analyzed: 05/25/2011 04:52

Source: C106028-09

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1-Dichloroethene	20		1.0	ug/L	20.0	0.60 U	101	75-133			
Benzene	20		1.0	ug/L	20.0	0.68 U	102	81-134			
Chlorobenzene	21		1.0	ug/L	20.0	0.74 U	104	83-117			
Toluene	20		1.0	ug/L	20.0	0.85 U	100	71-118			
Trichloroethene	20		1.0	ug/L	20.0	0.72 U	99	75-115			

**Matrix Spike Dup (1E24016-MSD1)**

Prepared: 05/24/2011 10:33 Analyzed: 05/25/2011 05:21

Source: C106028-09

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1-Dichloroethene	19		1.0	ug/L	20.0	0.60 U	95	75-133	6	20	
Benzene	20		1.0	ug/L	20.0	0.68 U	98	81-134	4	17	
Chlorobenzene	20		1.0	ug/L	20.0	0.74 U	102	83-117	3	16	
Toluene	19		1.0	ug/L	20.0	0.85 U	96	71-118	4	17	
Trichloroethene	18		1.0	ug/L	20.0	0.72 U	92	75-115	7	18	

Batch 1E25007 - EPA 5030B\_MS

**Blank (1E25007-BLK1)**

Prepared: 05/25/2011 08:49 Analyzed: 05/26/2011 05:13

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1,2-Tetrachloroethane	0.90	U	1.0	ug/L							
1,1,1-Trichloroethane	0.65	U	1.0	ug/L							
1,1,2,2-Tetrachloroethane	0.75	U	1.0	ug/L							
1,1,2-Trichloroethane	0.66	U	1.0	ug/L							
1,1-Dichloroethane	0.080	U	1.0	ug/L							
1,1-Dichloroethene	0.60	U	1.0	ug/L							
1,2,3-Trichloropropane	0.72	U	1.0	ug/L							
1,2-Dibromo-3-chloropropane	0.48	U	1.0	ug/L							
1,2-Dibromoethane	0.66	U	1.0	ug/L							
1,2-Dichlorobenzene	0.11	U	1.0	ug/L							



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**QUALITY CONTROL****Volatile Organic Compounds by GCMS - Quality Control**

Batch 1E25007 - EPA 5030B\_MS

**Blank (1E25007-BLK1) Continued**

Prepared: 05/25/2011 08:49 Analyzed: 05/26/2011 05:13

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2-Dichloroethane	0.47	U	1.0	ug/L							
1,2-Dichloropropane	0.59	U	1.0	ug/L							
1,4-Dichlorobenzene	0.79	U	1.0	ug/L							
2-Butanone	1.3	U	5.0	ug/L							
2-Hexanone	0.88	U	5.0	ug/L							
4-Methyl-2-pentanone	1.1	U	5.0	ug/L							
Acetone	1.2	U	5.0	ug/L							
Acrylonitrile	3.5	U	10	ug/L							
Benzene	0.68	U	1.0	ug/L							
Bromochloromethane	0.87	U	1.0	ug/L							
Bromodichloromethane	0.75	U	1.0	ug/L							
Bromoform	0.68	U	1.0	ug/L							
Bromomethane	0.58	U	1.0	ug/L							
Carbon disulfide	1.5	U	5.0	ug/L							
Carbon tetrachloride	0.69	U	1.0	ug/L							
Chlorobenzene	0.74	U	1.0	ug/L							
Chloroethane	0.75	U	1.0	ug/L							
Chloroform	0.70	U	1.0	ug/L							
Chloromethane	0.55	U	1.0	ug/L							
cis-1,2-Dichloroethene	0.72	U	1.0	ug/L							
cis-1,3-Dichloropropene	0.075	U	1.0	ug/L							
Dibromochloromethane	0.63	U	1.0	ug/L							
Dibromomethane	0.90	U	1.0	ug/L							
Ethylbenzene	0.62	U	1.0	ug/L							
Iodomethane	1.7	U	5.0	ug/L							
Methylene chloride	0.14	U	1.0	ug/L							
Styrene	0.053	U	1.0	ug/L							
Tetrachloroethene	0.73	U	1.0	ug/L							
Toluene	0.85	U	1.0	ug/L							
trans-1,2-Dichloroethene	0.12	U	1.0	ug/L							
trans-1,3-Dichloropropene	0.50	U	1.0	ug/L							
trans-1,4-Dichloro-2-butene	0.70	U	1.0	ug/L							
Trichloroethene	0.72	U	1.0	ug/L							
Trichlorofluoromethane	0.66	U	1.0	ug/L							
Vinyl acetate	0.95	U	5.0	ug/L							
Vinyl chloride	0.60	U	1.0	ug/L							
Xylenes (Total)	2.1	U	3.0	ug/L							
Surrogate: 4-Bromofluorobenzene	45			ug/L	50.0		90	51-122			
Surrogate: Dibromofluoromethane	46			ug/L	50.0		92	68-117			
Surrogate: Toluene-d8	45			ug/L	50.0		89	69-110			

**LCS (1E25007-BS1)**

Prepared: 05/25/2011 08:49 Analyzed: 05/26/2011 05:42

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1-Dichloroethene	20		1.0	ug/L	20.0		98	75-133			
Benzene	21		1.0	ug/L	20.0		106	81-134			
Chlorobenzene	21		1.0	ug/L	20.0		103	83-117			
Toluene	20		1.0	ug/L	20.0		100	71-118			



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**QUALITY CONTROL**

**Volatile Organic Compounds by GCMS - Quality Control**

Batch 1E25007 - EPA 5030B\_MS

**LCS (1E25007-BS1) Continued**

Prepared: 05/25/2011 08:49 Analyzed: 05/26/2011 05:42

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Trichloroethene	20		1.0	ug/L	20.0		99	75-115			

**Matrix Spike (1E25007-MS1)**

Prepared: 05/25/2011 08:49 Analyzed: 05/26/2011 06:11

Source: C106028-10

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1-Dichloroethene	21		1.0	ug/L	20.0	0.60 U	104	75-133			
Benzene	21		1.0	ug/L	20.0	0.68 U	104	81-134			
Chlorobenzene	20		1.0	ug/L	20.0	0.74 U	102	83-117			
Toluene	19		1.0	ug/L	20.0	0.85 U	97	71-118			
Trichloroethene	19		1.0	ug/L	20.0	0.72 U	94	75-115			

**Matrix Spike Dup (1E25007-MSD1)**

Prepared: 05/25/2011 08:49 Analyzed: 05/26/2011 06:41

Source: C106028-10

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1-Dichloroethene	20		1.0	ug/L	20.0	0.60 U	100	75-133	4	20	
Benzene	20		1.0	ug/L	20.0	0.68 U	100	81-134	4	17	
Chlorobenzene	20		1.0	ug/L	20.0	0.74 U	100	83-117	1	16	
Toluene	19		1.0	ug/L	20.0	0.85 U	96	71-118	1	17	
Trichloroethene	18		1.0	ug/L	20.0	0.72 U	92	75-115	3	18	

Batch 1E27021 - EPA 5030B\_MS

**Blank (1E27021-BLK1)**

Prepared: 05/27/2011 13:38 Analyzed: 05/27/2011 17:44

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1,2-Tetrachloroethane	0.90	U	1.0	ug/L							
1,1,1-Trichloroethane	0.65	U	1.0	ug/L							
1,1,2,2-Tetrachloroethane	0.75	U	1.0	ug/L							
1,1,2-Trichloroethane	0.66	U	1.0	ug/L							
1,1-Dichloroethane	0.080	U	1.0	ug/L							
1,1-Dichloroethene	0.60	U	1.0	ug/L							
1,2,3-Trichloropropane	0.72	U	1.0	ug/L							
1,2-Dibromo-3-chloropropane	0.48	U	1.0	ug/L							
1,2-Dibromoethane	0.66	U	1.0	ug/L							
1,2-Dichlorobenzene	0.11	U	1.0	ug/L							
1,2-Dichloroethane	0.47	U	1.0	ug/L							
1,2-Dichloropropane	0.59	U	1.0	ug/L							
1,4-Dichlorobenzene	0.79	U	1.0	ug/L							
2-Butanone	1.3	U	5.0	ug/L							
2-Hexanone	0.88	U	5.0	ug/L							
4-Methyl-2-pentanone	1.1	U	5.0	ug/L							
Acetone	1.2	U	5.0	ug/L							
Acrylonitrile	3.5	U	10	ug/L							
Benzene	0.68	U	1.0	ug/L							
Bromochloromethane	0.87	U	1.0	ug/L							
Bromodichloromethane	0.75	U	1.0	ug/L							



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**QUALITY CONTROL****Volatile Organic Compounds by GCMS - Quality Control**

Batch 1E27021 - EPA 5030B\_MS

**Blank (1E27021-BLK1) Continued**

Prepared: 05/27/2011 13:38 Analyzed: 05/27/2011 17:44

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Bromoform	0.68	U	1.0	ug/L							
Bromomethane	0.58	U	1.0	ug/L							
Carbon disulfide	1.5	U	5.0	ug/L							
Carbon tetrachloride	0.69	U	1.0	ug/L							
Chlorobenzene	0.74	U	1.0	ug/L							
Chloroethane	0.75	U	1.0	ug/L							
Chloroform	0.70	U	1.0	ug/L							
Chloromethane	0.55	U	1.0	ug/L							
cis-1,2-Dichloroethene	0.72	U	1.0	ug/L							
cis-1,3-Dichloropropene	0.075	U	1.0	ug/L							
Dibromochloromethane	0.63	U	1.0	ug/L							
Dibromomethane	0.90	U	1.0	ug/L							
Ethylbenzene	0.62	U	1.0	ug/L							
Iodomethane	1.7	U	5.0	ug/L							
Methylene chloride	0.14	U	1.0	ug/L							
Styrene	0.053	U	1.0	ug/L							
Tetrachloroethene	0.73	U	1.0	ug/L							
Toluene	0.85	U	1.0	ug/L							
trans-1,2-Dichloroethene	0.12	U	1.0	ug/L							
trans-1,3-Dichloropropene	0.50	U	1.0	ug/L							
trans-1,4-Dichloro-2-butene	0.70	U	1.0	ug/L							
Trichloroethene	0.72	U	1.0	ug/L							
Trichlorofluoromethane	0.66	U	1.0	ug/L							
Vinyl acetate	0.95	U	5.0	ug/L							
Vinyl chloride	0.60	U	1.0	ug/L							
Xylenes (Total)	2.1	U	3.0	ug/L							
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Surrogate: 4-Bromofluorobenzene	50			ug/L	50.0		100	51-122			
Surrogate: Dibromofluoromethane	49			ug/L	50.0		99	68-117			
Surrogate: Toluene-d8	46			ug/L	50.0		92	69-110			

**LCS (1E27021-BS1)**

Prepared: 05/27/2011 13:38 Analyzed: 05/27/2011 18:13

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1-Dichloroethene	24		1.0	ug/L	20.0		118	75-133			
Benzene	19		1.0	ug/L	20.0		94	81-134			
Chlorobenzene	19		1.0	ug/L	20.0		96	83-117			
Toluene	19		1.0	ug/L	20.0		94	71-118			
Trichloroethene	21		1.0	ug/L	20.0		104	75-115			

**Matrix Spike (1E27021-MS1)**

Prepared: 05/27/2011 13:38 Analyzed: 05/27/2011 18:43

Source: C106212-12

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1-Dichloroethene	22		1.0	ug/L	20.0	0.60 U	109	75-133			
Benzene	18		1.0	ug/L	20.0	0.68 U	91	81-134			
Chlorobenzene	19		1.0	ug/L	20.0	0.74 U	94	83-117			
Toluene	18		1.0	ug/L	20.0	0.85 U	91	71-118			
Trichloroethene	20		1.0	ug/L	20.0	0.72 U	98	75-115			



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**QUALITY CONTROL**

**Volatile Organic Compounds by GCMS - Quality Control**

Batch 1E27021 - EPA 5030B\_MS

**Matrix Spike Dup (1E27021-MSD1)**

Prepared: 05/27/2011 13:38 Analyzed: 05/27/2011 19:13

Source: C106212-12

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1-Dichloroethene	22		1.0	ug/L	20.0	0.60 U	112	75-133	3	20	
Benzene	19		1.0	ug/L	20.0	0.68 U	93	81-134	2	17	
Chlorobenzene	20		1.0	ug/L	20.0	0.74 U	98	83-117	5	16	
Toluene	19		1.0	ug/L	20.0	0.85 U	94	71-118	4	17	
Trichloroethene	20		1.0	ug/L	20.0	0.72 U	100	75-115	2	18	

**Metals (total recoverable) by EPA 6000/7000 Series Methods - Quality Control**

Batch 1E23014 - EPA 3005A

**Blank (1E23014-BLK1)**

Prepared: 05/23/2011 09:52 Analyzed: 05/24/2011 12:14

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	2.80	U	10.0	ug/L							
Barium	1.00	U	10.0	ug/L							
Beryllium	0.100	U	1.00	ug/L							
Cadmium	0.360	U	1.00	ug/L							
Chromium	1.00	U	10.0	ug/L							
Cobalt	1.10	U	10.0	ug/L							
Copper	1.60	U	10.0	ug/L							
Lead	1.90	U	10.0	ug/L							
Nickel	1.80	U	10.0	ug/L							
Silver	1.90	U	10.0	ug/L							
Vanadium	1.40	U	10.0	ug/L							
Zinc	3.80	U	10.0	ug/L							

**LCS (1E23014-BS1)**

Prepared: 05/23/2011 09:52 Analyzed: 05/24/2011 12:09

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	533		10.0	ug/L	500		107	80-120			
Barium	536		10.0	ug/L	500		107	80-120			
Beryllium	269		1.00	ug/L	250		108	80-120			
Cadmium	266		1.00	ug/L	250		106	80-120			
Chromium	538		10.0	ug/L	500		108	80-120			
Cobalt	528		10.0	ug/L	500		106	80-120			
Copper	271		10.0	ug/L	250		109	80-120			
Lead	539		10.0	ug/L	500		108	80-120			
Nickel	535		10.0	ug/L	500		107	80-120			
Silver	273		10.0	ug/L	250		109	80-120			
Vanadium	271		10.0	ug/L	250		109	80-120			
Zinc	533		10.0	ug/L	500		107	80-120			

**Matrix Spike (1E23014-MS1)**

Prepared: 05/23/2011 09:52 Analyzed: 05/24/2011 12:19

Source: C105631-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**QUALITY CONTROL**

**Metals (total recoverable) by EPA 6000/7000 Series Methods - Quality Control**

Batch 1E23014 - EPA 3005A

**Matrix Spike (1E23014-MS1) Continued**

Prepared: 05/23/2011 09:52 Analyzed: 05/24/2011 12:19

Source: C105631-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	533		10.0	ug/L	500	2.80 U	107	75-125			
Barium	634		10.0	ug/L	500	83.0	110	75-125			
Beryllium	269		1.00	ug/L	250	0.242	108	75-125			
Cadmium	267		1.00	ug/L	250	0.360 U	107	75-125			
Chromium	555		10.0	ug/L	500	8.21	109	75-125			
Cobalt	534		10.0	ug/L	500	1.10 U	107	75-125			
Copper	277		10.0	ug/L	250	2.62	110	75-125			
Lead	542		10.0	ug/L	500	1.90 U	108	75-125			
Nickel	542		10.0	ug/L	500	2.99	108	75-125			
Silver	276		10.0	ug/L	250	1.90 U	110	75-125			
Vanadium	280		10.0	ug/L	250	3.86	110	75-125			
Zinc	545		10.0	ug/L	500	7.80	107	75-125			

**Matrix Spike Dup (1E23014-MSD1)**

Prepared: 05/23/2011 09:52 Analyzed: 05/24/2011 12:21

Source: C105631-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	532		10.0	ug/L	500	2.80 U	106	75-125	0.2	20	
Barium	634		10.0	ug/L	500	83.0	110	75-125	0.07	20	
Beryllium	270		1.00	ug/L	250	0.242	108	75-125	0.4	20	
Cadmium	268		1.00	ug/L	250	0.360 U	107	75-125	0.1	20	
Chromium	554		10.0	ug/L	500	8.21	109	75-125	0.05	20	
Cobalt	535		10.0	ug/L	500	1.10 U	107	75-125	0.2	20	
Copper	278		10.0	ug/L	250	2.62	110	75-125	0.1	20	
Lead	539		10.0	ug/L	500	1.90 U	108	75-125	0.5	20	
Nickel	541		10.0	ug/L	500	2.99	108	75-125	0.06	20	
Silver	276		10.0	ug/L	250	1.90 U	110	75-125	0.2	20	
Vanadium	281		10.0	ug/L	250	3.86	111	75-125	0.2	20	
Zinc	548		10.0	ug/L	500	7.80	108	75-125	0.5	20	

**Post Spike (1E23014-PS1)**

Prepared: 05/23/2011 09:52 Analyzed: 05/24/2011 12:24

Source: C105631-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	1.05		0.0100	mg/L	1.00	0.00203	105	80-120			
Barium	1.15		0.0100	mg/L	1.00	0.0830	107	80-120			
Beryllium	0.531		0.00100	mg/L	0.500	0.000242	106	80-120			
Cadmium	0.524		0.00100	mg/L	0.500	4.39E-5	105	80-120			
Chromium	1.07		0.0100	mg/L	1.00	0.00821	106	80-120			
Cobalt	1.04		0.0100	mg/L	1.00	0.000820	104	80-120			
Copper	0.538		0.0100	mg/L	0.500	0.00262	107	80-120			
Lead	1.05		0.0100	mg/L	1.00	0.00144	105	80-120			
Nickel	1.05		0.0100	mg/L	1.00	0.00299	105	80-120			
Silver	0.529		0.0100	mg/L	0.500	0.000606	106	80-120			
Vanadium	0.543		0.0100	mg/L	0.500	0.00386	108	80-120			
Zinc	1.06		0.0100	mg/L	1.00	0.00780	105	80-120			



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**QUALITY CONTROL**

**Metals (total recoverable) by EPA 6000/7000 Series Methods - Quality Control**

Batch 1E23014 - EPA 3005A

Batch 1E23020 - EPA 3005A

**Blank (1E23020-BLK1)**

Prepared: 05/23/2011 11:31 Analyzed: 05/27/2011 09:51

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Antimony	0.220	U	2.00	ug/L							
Selenium	0.830	U	1.00	ug/L							
Thallium	0.110	U	1.00	ug/L							

**LCS (1E23020-BS1)**

Prepared: 05/23/2011 11:31 Analyzed: 05/27/2011 09:55

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Antimony	25.2		2.00	ug/L	25.0		101	80-120			
Selenium	24.2		1.00	ug/L	25.0		97	80-120			
Thallium	25.0		1.00	ug/L	25.0		100	80-120			

**Matrix Spike (1E23020-MS1)**

Prepared: 05/23/2011 11:31 Analyzed: 05/27/2011 10:02

Source: C105386-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Antimony	24.3		2.00	ug/L	25.0	0.220 U	97	80-120			
Selenium	25.1		1.00	ug/L	25.0	0.830 U	100	80-120			
Thallium	24.9		1.00	ug/L	25.0	0.110 U	100	80-120			

**Matrix Spike Dup (1E23020-MSD1)**

Prepared: 05/23/2011 11:31 Analyzed: 05/27/2011 10:06

Source: C105386-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Antimony	23.9		2.00	ug/L	25.0	0.220 U	96	80-120	2	20	
Selenium	23.7		1.00	ug/L	25.0	0.830 U	95	80-120	6	20	
Thallium	24.8		1.00	ug/L	25.0	0.110 U	99	80-120	0.5	20	

**Post Spike (1E23020-PS1)**

Prepared: 05/23/2011 11:31 Analyzed: 05/27/2011 10:09

Source: C105386-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Antimony	24.0		2.00	ug/L	25.0	-0.00900	96	80-120			
Selenium	22.7		1.00	ug/L	25.0	0.253	90	80-120			
Thallium	23.7		1.00	ug/L	25.0	0.0680	95	80-120			

Batch 1E23021 - EPA 3005A

**Blank (1E23021-BLK1)**

Prepared: 05/23/2011 11:34 Analyzed: 05/25/2011 14:56

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Antimony	0.220	U	2.00	ug/L							
Selenium	0.830	U	1.00	ug/L							
Thallium	0.110	U	1.00	ug/L							

**LCS (1E23021-BS1)**

Prepared: 05/23/2011 11:34 Analyzed: 05/25/2011 15:00



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**QUALITY CONTROL**

**Metals (total recoverable) by EPA 6000/7000 Series Methods - Quality Control**

Batch 1E23021 - EPA 3005A

**LCS (1E23021-BS1) Continued**

Prepared: 05/23/2011 11:34 Analyzed: 05/25/2011 15:00

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Antimony	25.4		2.00	ug/L	25.0		102	80-120			
Selenium	25.3		1.00	ug/L	25.0		101	80-120			
Thallium	24.4		1.00	ug/L	25.0		98	80-120			

**Matrix Spike (1E23021-MS1)**

Prepared: 05/23/2011 11:34 Analyzed: 05/25/2011 15:07

Source: C105310-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Antimony	25.9		2.00	ug/L	25.0	0.220 U	103	80-120			
Selenium	29.5		1.00	ug/L	25.0	3.88	103	80-120			
Thallium	22.5		1.00	ug/L	25.0	0.110 U	90	80-120			

**Matrix Spike Dup (1E23021-MSD1)**

Prepared: 05/23/2011 11:34 Analyzed: 05/25/2011 15:11

Source: C105310-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Antimony	26.2		2.00	ug/L	25.0	0.220 U	105	80-120	1	20	
Selenium	29.8		1.00	ug/L	25.0	3.88	104	80-120	1	20	
Thallium	22.4		1.00	ug/L	25.0	0.110 U	90	80-120	0.6	20	

**Post Spike (1E23021-PS1)**

Prepared: 05/23/2011 11:34 Analyzed: 05/25/2011 15:15

Source: C105310-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Antimony	24.4		2.00	ug/L	25.0	0.133	97	80-120			
Selenium	27.7		1.00	ug/L	25.0	3.88	95	80-120			
Thallium	20.8		1.00	ug/L	25.0	-2.21	92	80-120			

Batch 1E24010 - EPA 3005A

**Blank (1E24010-BLK1)**

Prepared: 05/24/2011 09:38 Analyzed: 05/25/2011 09:45

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	2.80	U	10.0	ug/L							
Barium	1.00	U	10.0	ug/L							
Beryllium	0.100	U	1.00	ug/L							
Cadmium	0.360	U	1.00	ug/L							
Chromium	1.00	U	10.0	ug/L							
Cobalt	1.10	U	10.0	ug/L							
Copper	1.60	U	10.0	ug/L							
Lead	1.90	U	10.0	ug/L							
Nickel	1.80	U	10.0	ug/L							
Silver	1.90	U	10.0	ug/L							
Vanadium	1.40	U	10.0	ug/L							
Zinc	3.80	U	10.0	ug/L							

**LCS (1E24010-BS1)**

Prepared: 05/24/2011 09:38 Analyzed: 05/25/2011 09:47



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**QUALITY CONTROL**

**Metals (total recoverable) by EPA 6000/7000 Series Methods - Quality Control**

Batch 1E24010 - EPA 3005A

**LCS (1E24010-BS1) Continued**

Prepared: 05/24/2011 09:38 Analyzed: 05/25/2011 09:47

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	516		10.0	ug/L	500		103	80-120			
Barium	521		10.0	ug/L	500		104	80-120			
Beryllium	267		1.00	ug/L	250		107	80-120			
Cadmium	259		1.00	ug/L	250		104	80-120			
Chromium	528		10.0	ug/L	500		106	80-120			
Cobalt	515		10.0	ug/L	500		103	80-120			
Copper	265		10.0	ug/L	250		106	80-120			
Lead	521		10.0	ug/L	500		104	80-120			
Nickel	523		10.0	ug/L	500		105	80-120			
Silver	270		10.0	ug/L	250		108	80-120			
Vanadium	266		10.0	ug/L	250		107	80-120			
Zinc	522		10.0	ug/L	500		104	80-120			

**Matrix Spike (1E24010-MS1)**

Prepared: 05/24/2011 09:38 Analyzed: 05/25/2011 09:58

Source: C105310-05

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	515		10.0	ug/L	500	2.80 U	103	75-125			
Barium	551		10.0	ug/L	500	25.8	105	75-125			
Beryllium	268		1.00	ug/L	250	0.123	107	75-125			
Cadmium	259		1.00	ug/L	250	0.360 U	104	75-125			
Chromium	529		10.0	ug/L	500	1.00 U	106	75-125			
Cobalt	517		10.0	ug/L	500	1.10 U	103	75-125			
Copper	266		10.0	ug/L	250	1.60 U	106	75-125			
Lead	524		10.0	ug/L	500	1.90 U	105	75-125			
Nickel	523		10.0	ug/L	500	1.80 U	105	75-125			
Silver	271		10.0	ug/L	250	1.90 U	108	75-125			
Vanadium	269		10.0	ug/L	250	1.40 U	108	75-125			
Zinc	523		10.0	ug/L	500	3.80 U	105	75-125			

**Matrix Spike Dup (1E24010-MSD1)**

Prepared: 05/24/2011 09:38 Analyzed: 05/25/2011 10:00

Source: C105310-05

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	519		10.0	ug/L	500	2.80 U	104	75-125	0.8	20	
Barium	550		10.0	ug/L	500	25.8	105	75-125	0.2	20	
Beryllium	267		1.00	ug/L	250	0.123	107	75-125	0.4	20	
Cadmium	260		1.00	ug/L	250	0.360 U	104	75-125	0.3	20	
Chromium	530		10.0	ug/L	500	1.00 U	106	75-125	0.08	20	
Cobalt	517		10.0	ug/L	500	1.10 U	103	75-125	0.09	20	
Copper	265		10.0	ug/L	250	1.60 U	106	75-125	0.3	20	
Lead	521		10.0	ug/L	500	1.90 U	104	75-125	0.6	20	
Nickel	523		10.0	ug/L	500	1.80 U	105	75-125	0.2	20	
Silver	271		10.0	ug/L	250	1.90 U	108	75-125	0.07	20	
Vanadium	269		10.0	ug/L	250	1.40 U	107	75-125	0.1	20	
Zinc	524		10.0	ug/L	500	3.80 U	105	75-125	0.2	20	



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**QUALITY CONTROL**

**Metals (total recoverable) by EPA 6000/7000 Series Methods - Quality Control**

Batch 1E24010 - EPA 3005A

Post Spike (1E24010-PS1)

Prepared: 05/24/2011 09:38 Analyzed: 05/25/2011 09:53

Source: C105310-05

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	1.01		0.0100	mg/L	1.00	0.000593	101	80-120			
Barium	1.05		0.0100	mg/L	1.00	0.0258	102	80-120			
Beryllium	0.523		0.00100	mg/L	0.500	0.000123	105	80-120			
Cadmium	0.504		0.00100	mg/L	0.500	0.000151	101	80-120			
Chromium	1.03		0.0100	mg/L	1.00	-1.69E-5	103	80-120			
Cobalt	1.00		0.0100	mg/L	1.00	0.000827	100	80-120			
Copper	0.512		0.0100	mg/L	0.500	0.000333	102	80-120			
Lead	1.01		0.0100	mg/L	1.00	0.000209	101	80-120			
Nickel	1.01		0.0100	mg/L	1.00	8.61E-5	101	80-120			
Silver	0.518		0.0100	mg/L	0.500	-2.94E-5	104	80-120			
Vanadium	0.522		0.0100	mg/L	0.500	0.000329	104	80-120			
Zinc	1.02		0.0100	mg/L	1.00	0.00112	102	80-120			

**FLAGS/NOTES AND DEFINITIONS**

- B The analyte was detected in the associated method blank.
- D The sample was analyzed at dilution.
- J The reported value is between the laboratory method detection limit (MDL) and the laboratory method reporting limit (MRL), adjusted for actual sample preparation data and moisture content, where applicable.
- U The analyte was analyzed for but not detected to the level shown, adjusted for actual sample preparation data and moisture content, where applicable.
- E The concentration indicated for this analyte is an estimated value above the calibration range of the instrument. This value is considered an estimate.
- MRL Method Reporting Limit. The MRL is roughly equivalent to the practical quantitation limit (PQL) and is based on the low point of the calibration curve, when applicable, sample preparation factor, dilution factor, and, in the case of soil samples, moisture content.

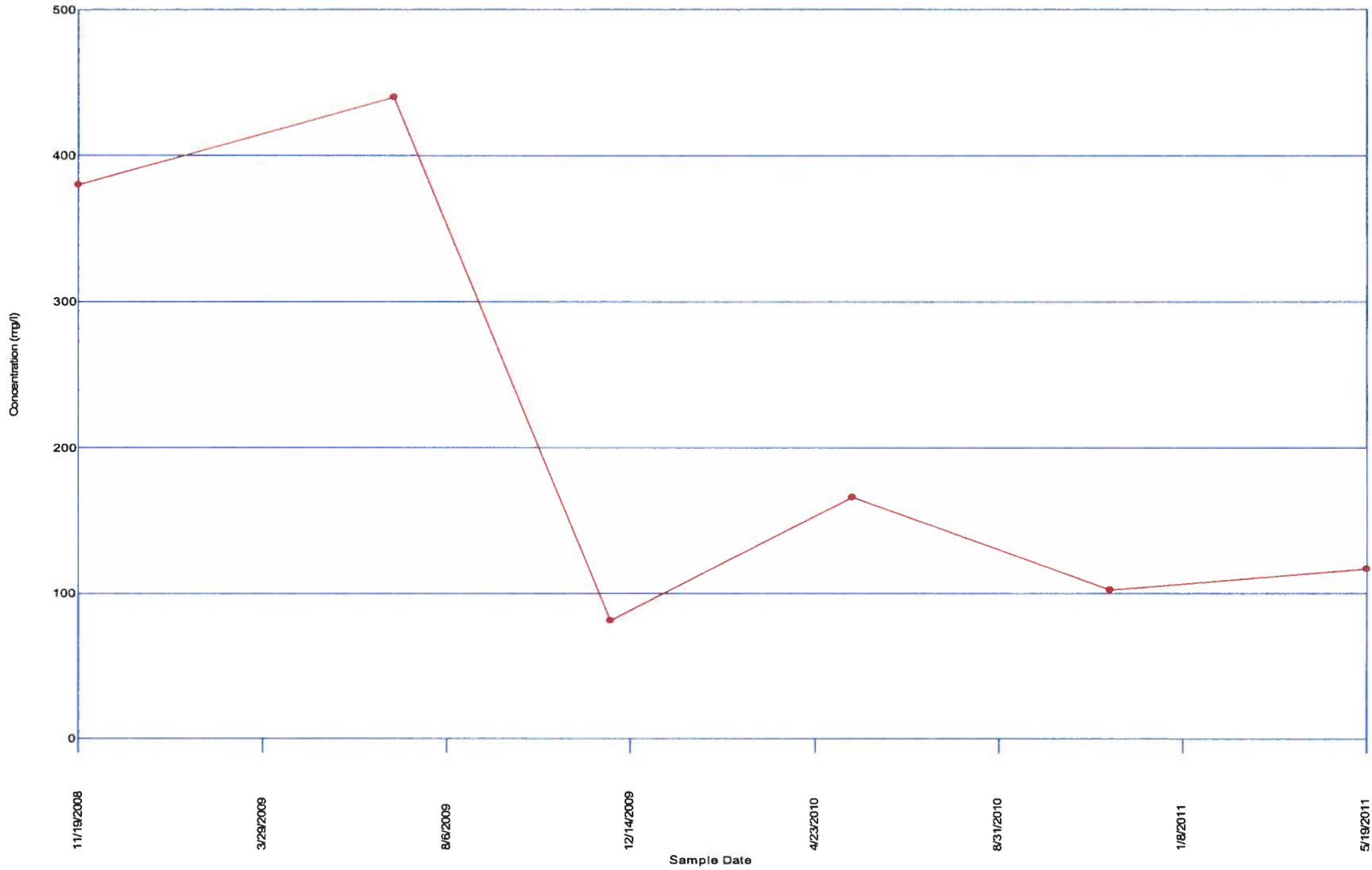




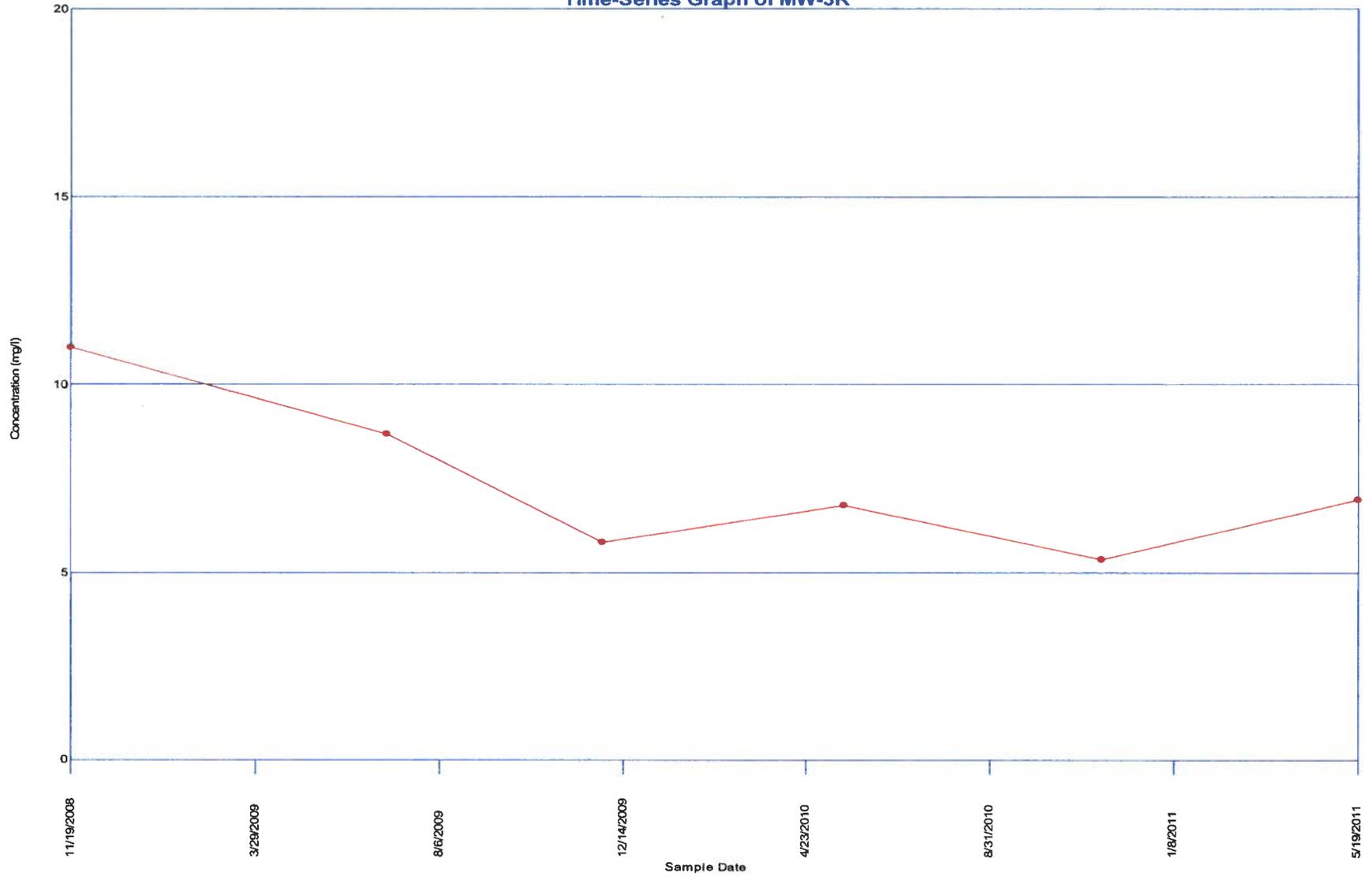
**APPENDIX III**  
**COMPACT DISK WITH ELECTRONIC COPY OF TABLE 12 (.XLS)**  
**AND ELECTRONIC COPY OF THIS REPORT (.PDF)**

**APPENDIX IV**  
**TIME SERIES GRAPHS FOR MONITOR WELLS**

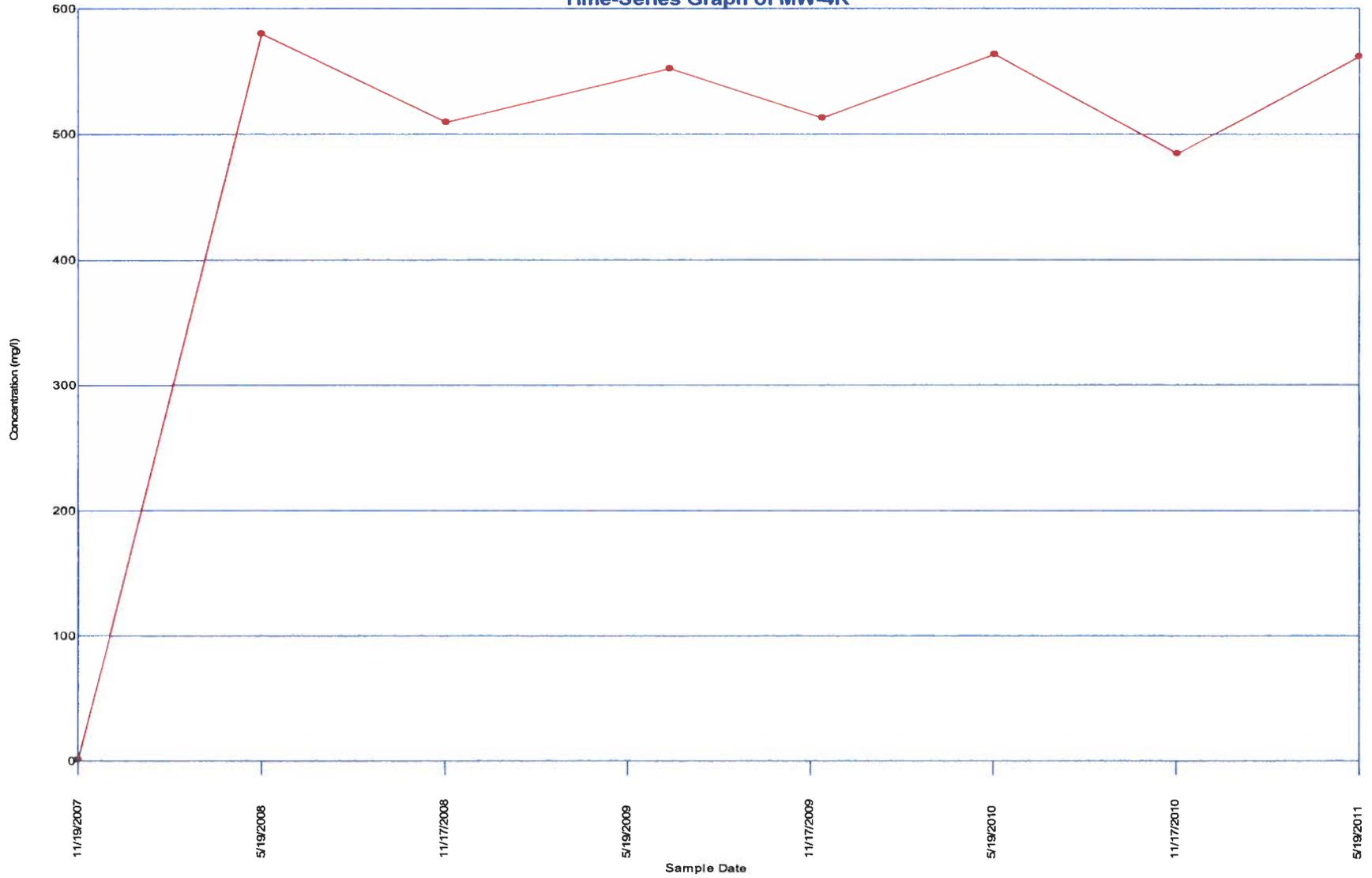
### Barium Time-Series Graph of MW-3R



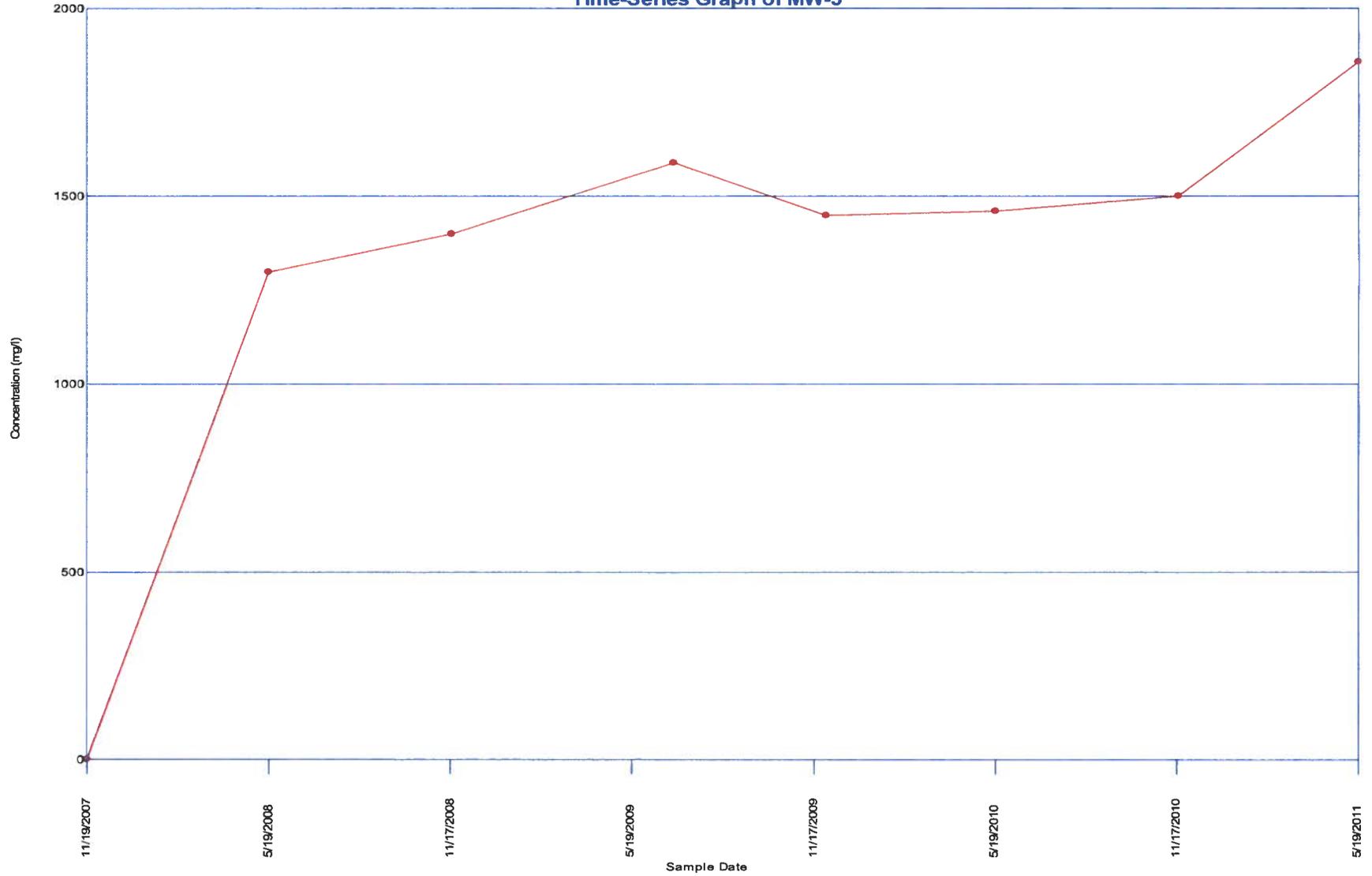
**Nickel**  
**Time-Series Graph of MW-3R**



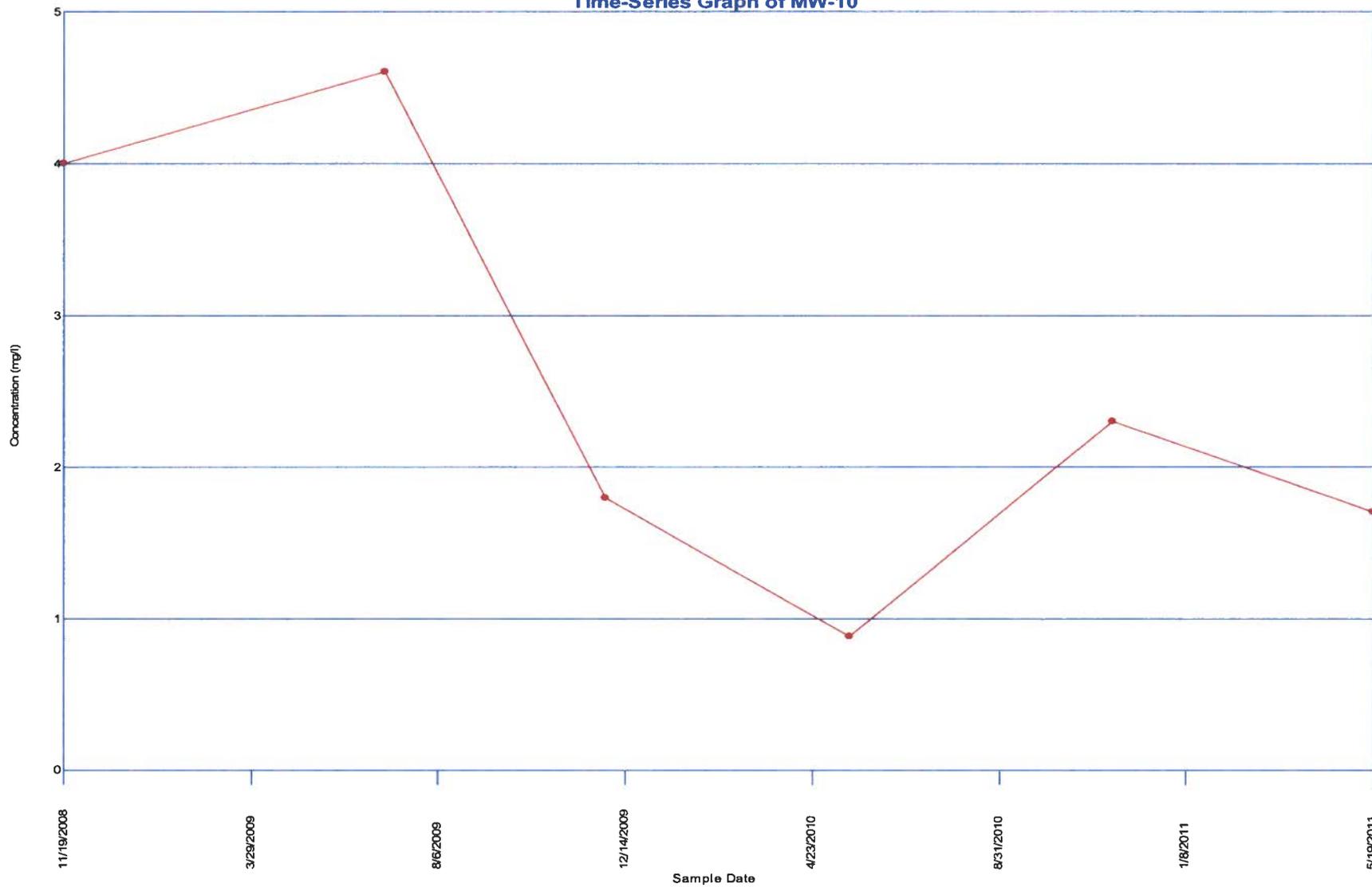
**Barium**  
Time-Series Graph of MW-4R



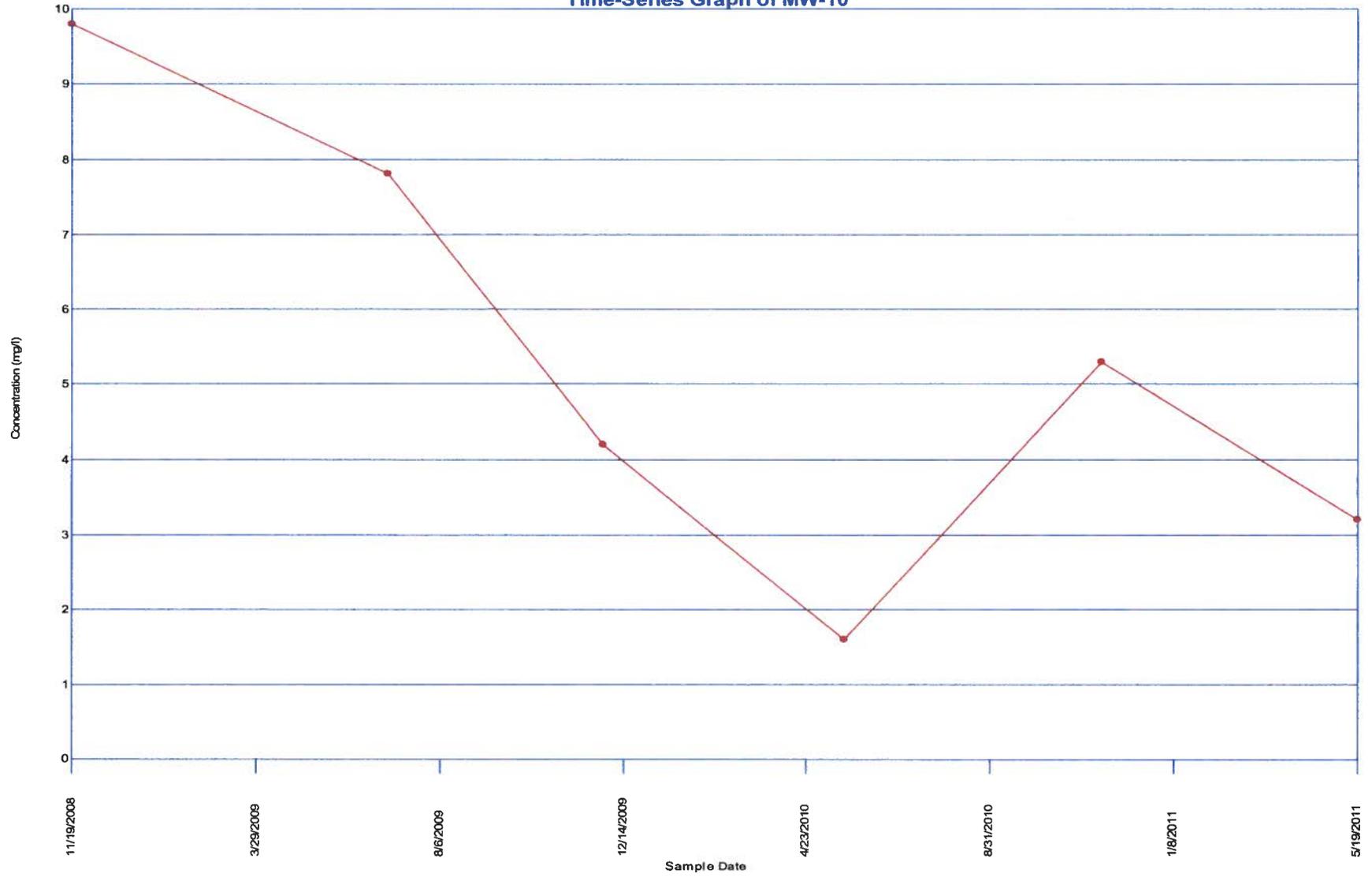
**Barium**  
Time-Series Graph of MW-5



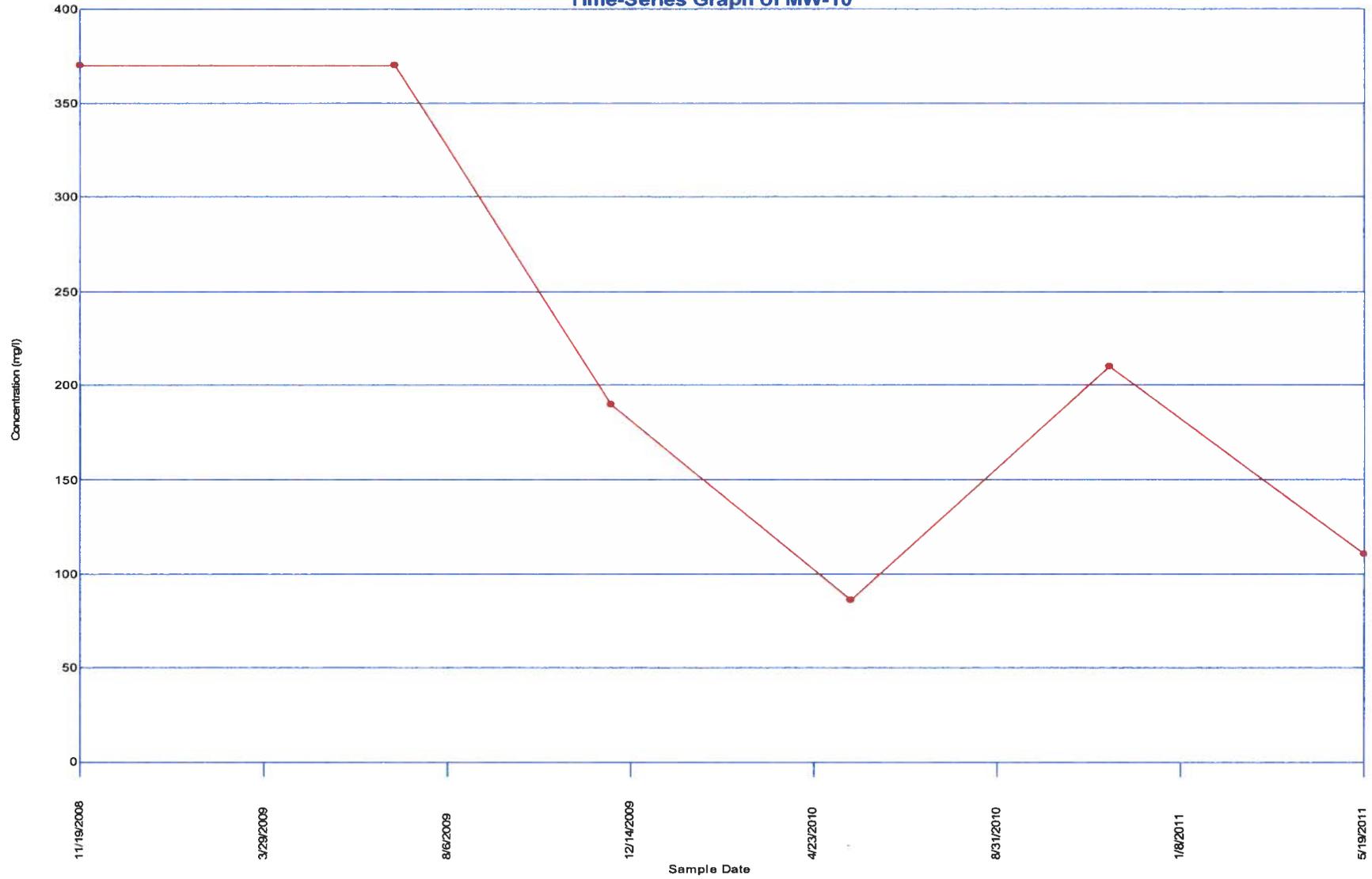
**Benzene**  
**Time-Series Graph of MW-10**



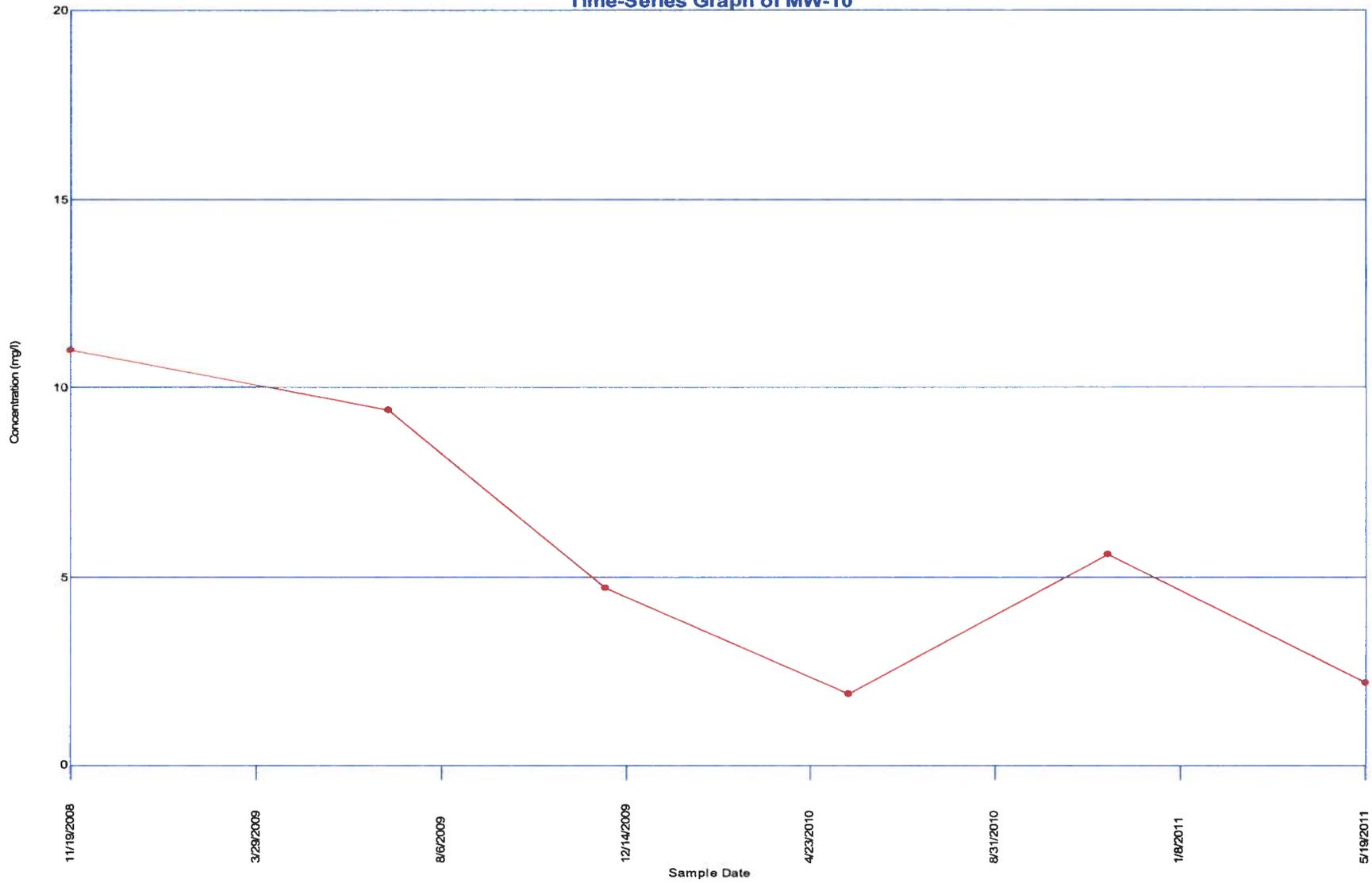
**1,1-Dichloroethane**  
**Time-Series Graph of MW-10**



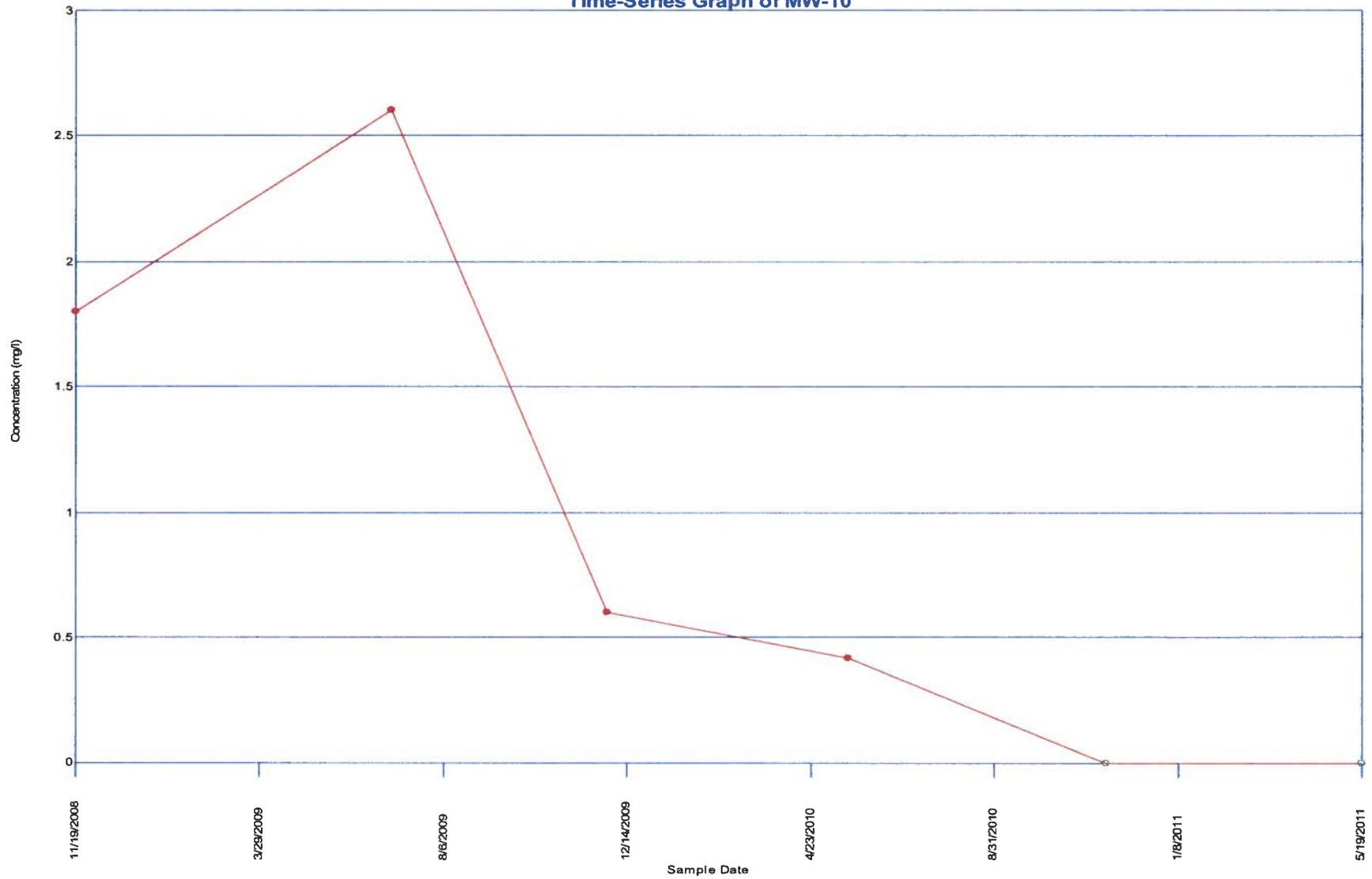
**cis-1,2-Dichloroethene**  
**Time-Series Graph of MW-10**



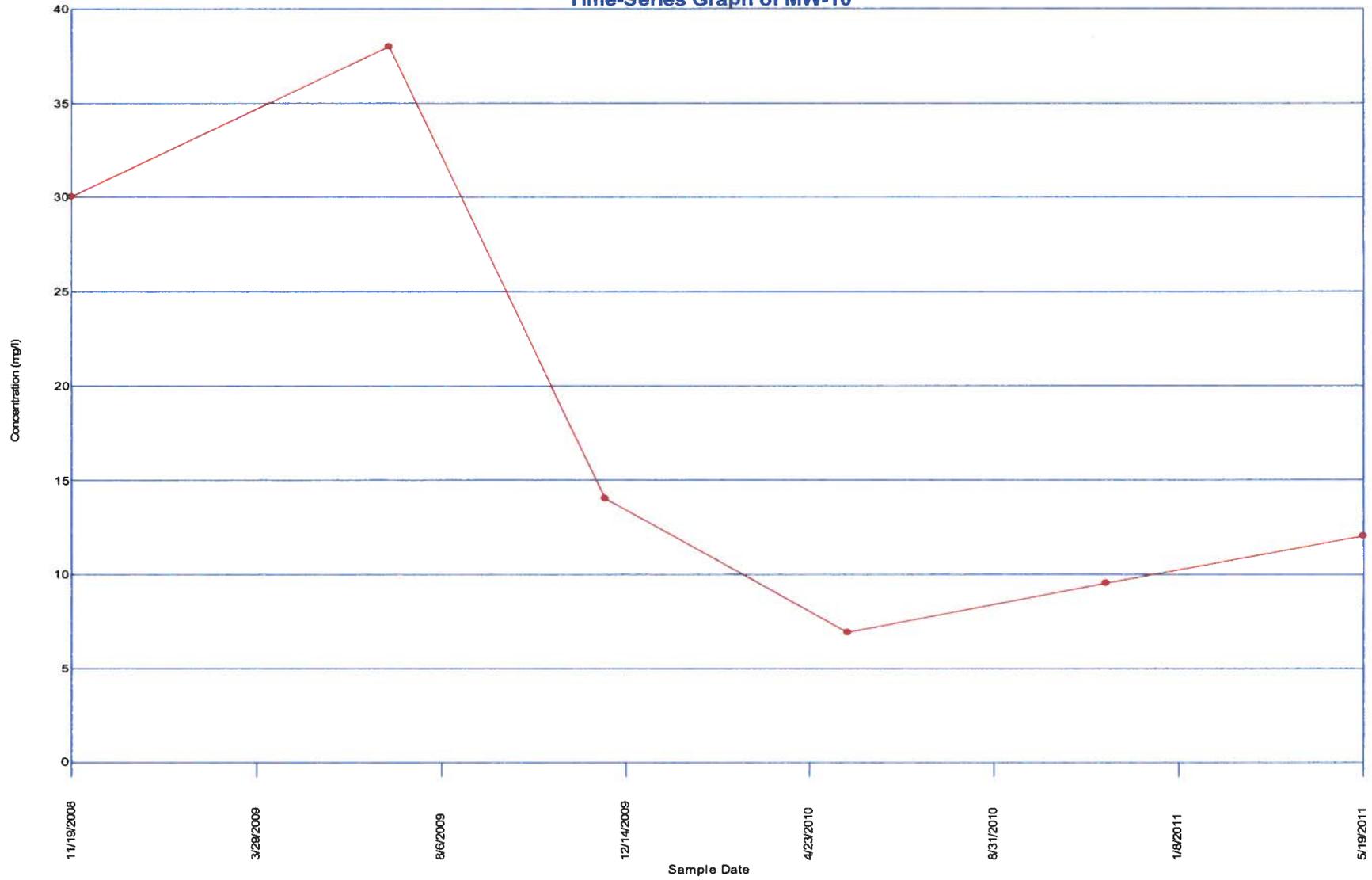
**1,2-Dichloropropane  
Time-Series Graph of MW-10**



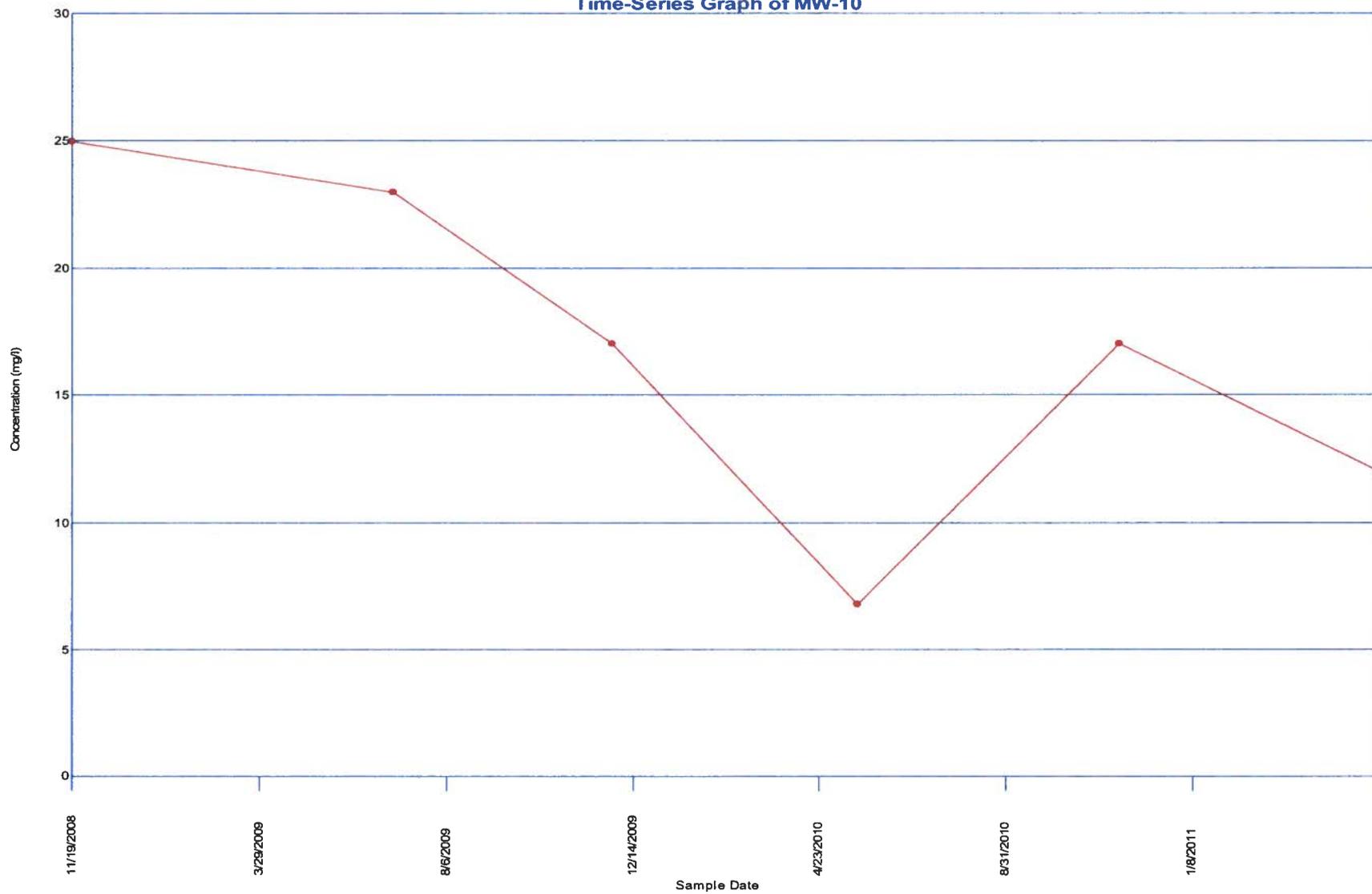
### Tetrachloroethene Time-Series Graph of MW-10



**Trichloroethene**  
**Time-Series Graph of MW-10**



**Vinyl chloride**  
**Time-Series Graph of MW-10**



**APPENDIX V**  
**MONITOR WELL INSTALLATION REPORT (MW-11)**



March 22, 2011

City of Durham  
Department of Water Management  
1600 Mist Lake Drive  
Durham, North Carolina 27704

Attention: Mr. Simon Lobdell, P.E. email: [Simon.Lobdell@durhamnc.gov](mailto:Simon.Lobdell@durhamnc.gov)

Reference: Monitor Well Installation Report  
City of Durham, Closed Municipal Solid Waste Landfill  
Durham, North Carolina  
City of Durham Contract Number CT3839  
S&ME Project Number 1054-07-469 (Change Order No. 8)

Dear Mr. Lobdell:

S&ME, Inc., (S&ME) is pleased to provide the City of Durham with this letter report describing the findings of the installation and sampling of a new monitor well at the City of Durham's Closed Municipal Solid Waste Landfill. Services described herein were performed as a contingency task (Phase 101 Service) pursuant to the terms and conditions of the existing Contact between The City of Durham (City) and S&ME, dated October 27, 2007 (Durham Contract Number CT3839) and Change Order No. 8, dated December 8, 2010.

## **BACKGROUND**

Monitor well MW-5 is a compliance monitoring point along the northern boundary of the closed landfill. Historically, the following inorganic constituents (metals) have been sporadically detected at concentrations greater than the Groundwater Protection Standards promulgated by North Carolina Administrative Code (NCAC), Title 15A, Subchapter 2L (2L Standard) in monitor well MW-5:

- Barium
- Beryllium
- Chromium
- Cobalt
- Lead
- Mercury
- Nickel
- Thallium
- Vanadium
- Nickel
- Zinc

Of particular note has been the regular detection of barium in MW-5 above the 2L Standard of 1,000 µg/L. From the period of 2003 to 2006 barium was detected in MW-5 at concentrations ranging from 1,758 µg/L to 4,192 µg/L. Sample quality assurance measures implemented in 2007 to improve the sample quality control (i.e., re-developing the well, replacing the dedicated bladder pump, adhering to low-flow sampling techniques, and laboratory analysis of samples for dissolved and total metals ) did appear to reduce the detected concentrations of barium. From May 2007 to May 2010 barium was detected at concentration ranging from 1,240 µg/L to 1,590 µg/L. In January 2010 the State of North Carolina revised the 2L Standards for selected constituents. As a result, the 2L Standard for barium was lowered from 1,000 µg/L to 700 µg/L. It is likely the concentration of barium in compliance monitor well MW-5 will now exceed the 2L Standard on a regular basis.

The exact location of buried waste is not well defined at the edges of the landfill, however, based on S&ME's review of ground surface topography, available construction details for MW-5, and records of the closed MSW landfill, it appears that the well is installed in such close proximity to buried waste (estimated between 0 – 50 feet from the edge of waste) that the monitor well does not follow the guidelines presented by Test Methods for Evaluating Solid Waste, Volume II, Chapter 11, published by the United States Environmental Protection Agency (USEPA), document number SW-846.

As a result S&ME recommended installation of a new shallow monitor well in the vicinity of MW-5, further beyond the apparent waste boundary to evaluate the metals detections in MW-5 and to establish a new compliance monitoring point. The attached site map depicts the location of MW-5, and the location of replacement well MW-11. The exact location of MW-11 has not been surveyed, however, based on field measurements using a hand-held, differentially corrected global positioning system (GSP) unit, MW-11 is approximately 90 feet beyond the apparent waste boundary. A photographic log showing the location and construction of the new well has also been included.

## **MONITORING WELL (MW-11) INSTALLATION**

On January 21, 2011, the new monitoring well MW-11 was installed to approximately 15.5 feet below ground surface (bgs). The target well depth was selected prior to installation based on well construction records, historical groundwater levels measured at the site, and depth to the groundwater interface at the time of well construction.

S&ME personnel used a track-mounted Geoprobe drill rig equipped with 4.25-inch inside diameter hollow stem augers (augers) to advance a soil boring to refusal at approximately 15.5 feet ft-bgs. Once the boring was completed, the monitoring well was constructed through the annulus of the augers in accordance with well construction requirements presented in 15A NCAC.2C and was screened to intercept the surficial aquifer. The well construction consisted of a ten-foot long section of 2-inch diameter polyvinyl chloride (PVC) slotted (0.010-inch) screen and approximately 7.7 feet of solid riser pipe to bring

the well to approximately 2.2 feet above ground surface. The well was completed by placing #2 type filter sand in the annulus to approximately two feet above the screen section (sand pack). Next, approximately one foot of hydrated bentonite was tremied above the sand pack, and neat cement grout was then tremied on top of the bentonite to approximately six inches below ground surface. The well casing was encased with a four-inch diameter protective steel casing with lockable cap mounted in place with a four-inch thick concrete pad, measuring two feet by two feet. Following well installation, the monitoring well was developed until relatively clear, silt-free water was obtained.

A second site visit was necessary to further develop the well and reduce the fine silt that entered the well during the installation. Following the second redevelopment event turbidity of the water being purged from the well was measured to be 16 Nephelometric Turbidity Units (NTUs). A Non Residential Well Construction Record and Soil Boring Completion Report detailing well construction, lithology, field screening results, and relative water table measurement is included as attachments to this report. The monitoring well construction information for all wells at the site including the newly constructed well (MW-11) is summarized in **Table 1**. A site map depicting the approximate location of the newly installed monitoring well (MW-11) is attached as **Figure 1**.

## **MONITORING WELL (MW-11) SAMPLING**

On February 2, 2011, S&ME personnel collected one groundwater sample from the new monitoring well (MW-11). The sample was analyzed for Appendix I metals of which previous detections above the NCAC 2L Standards were detected in the former compliance monitoring well (MW-5).

Prior to sampling, the well was opened, allowed to equilibrate with atmospheric pressure and a depth-to-water measurement were recorded to the nearest 0.01 foot using an electronic water level indicator. The electronic water level indicator was decontaminated before its initial use. Field personnel wore clean protective/non-reactive gloves when collecting water level measurements and for collecting the water sample. At the time of sampling the depth to water was measured at 4.95 ft-bgs in monitor well MW-11.

Following the collection of the static groundwater level measurement, monitoring well MW-11 was purged and sampled using a peristaltic pump and low-flow sampling techniques. The well was sampled with new polyethylene tubing. As purging proceeded, pH, temperature, specific conductivity and turbidity were measured and recorded. A groundwater sample was collected after the field parameters stabilized and turbidity was reduced to a level below 20 NTUs as recommended in the facility water quality monitoring plan (WQMP). The field parameters measured immediately before collecting the groundwater sample are presented in **Table 2**.

Prior to sampling, the laboratory-supplied sample containers were prepared. Each sample container was labeled with the sample identification number, sampling personnel, date

and time of sample collection, project name and number, and requested chemical analyses. The groundwater sample was transferred directly from the polyethylene tubing into the labeled, laboratory-supplied, pre-preserved sample containers after purging. After collection, the sample was placed in a cooler on ice, under chain-of-custody control.

The February 2, 2011, the groundwater sample was submitted to Environmental Conservation Laboratories Inc. (ENCO) of Cary, North Carolina under chain-of-custody protocols. The groundwater sample was submitted for analysis of NC Appendix I Metals constituents. The results of analytical testing are discussed below and a summary of compound concentrations detected during this sampling event are presented in **Table 3**.

## **ANALYTICAL RESULTS**

Only one inorganic compound (metal) was detected above the 2L Standard in the new compliance well MW-11.

- Barium (1,050 µg/L) exceeded the 2L Standard (700 µg/L).

Nickel (4.39 µg/L) and selenium (1.50 µg/L) were detected above the laboratory method detection limits (MDLs) but below their respective 2L Standards in the MW-11 sample.

A summary of laboratory analytical results for MW-11 is included as **Table 3**. As a point of reference, the results are compared to the analytical data for the monitor well MW-5 (November 2010); the 2L Standard; and the Solid Waste Section Limit (SWSL). The SWSL is the lowest amount of analyte in a sample that can be quantitatively determined with suitable prediction and accuracy (version of PQL updated by NCDENR). A copy of the full analytical laboratory report is attached.

## **CONCLUSIONS AND RECOMMENDATIONS**

The analytical results indicate that barium is present at levels above its 2L Standard in the newly installed monitoring well MW-11 located approximately 90 feet beyond the apparent edge of waste.

Subchapter 13B of 15A NCAC is referred to as the “Solid Waste Rules” and govern the post closure monitoring requirements for the City of Durham closed MSW landfill. 13B .1631 provides guidance on the groundwater monitoring system for landfills. According to .1631(a)(2) a downgradient groundwater monitoring well shall be installed at the relevant point of compliance for a landfill. The relative point of compliance shall be established no more than 250 feet from a waste boundary and shall be at least 50 feet within the facility property boundary. As shown in **Figure 1**, monitor well MW-5, and the new replacement monitor well MW-11 are located well within the 250 feet compliance boundary. However, a small intermittent stream is also located immediately

north of MW-5 and MW-11 within the 250 foot compliance boundary. The Division of Waste Management (DWM) will most likely require that the hydrogeologic characteristics of the facility and the surrounding land be considered before establishing a new compliance monitoring well further north across the stream.

Currently, MW-5 is the established compliance monitoring point along the northeast corner of the landfill. If constituents indicating a release from the facility are detected beyond the established compliance point the facility must initiate an assessment monitoring program (.1634) which may subsequently lead to a nature and extent study (NES) – [.1634(g)(1)(A)], an assessment of corrective measures (ACM)-(.1635), and implementation of a corrective action plan (CAP)-(.1637).

According to .1632(g)2 a facility may demonstrate that a source other than the landfill caused the contamination. An alternate source demonstration (ASD) report must be prepared by a certified Licensed Geologist and submitted for approval by DWM. Because inorganic constituents (metals) are naturally occurring in soil, S&ME recommends performing an ASD to determine if concentrations of naturally occurring barium within insitu soils at the facility are sufficient to influence the concentration of barium in groundwater samples collected in monitor wells MW-5 and MW-11. The ASD should include collecting undisturbed, native soil in a background location; collecting soil samples in the vicinity of MW-5 and MW-11 for laboratory analysis; and evaluating the metals concentrations in soil in accordance with the USEPA's *Soil Screening Guidance: Technical Background Document* (EPA/540/R95/128-May 1996).

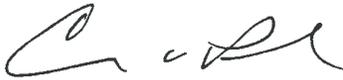
If the ASD does not demonstrate that concentrations of naturally occurring barium in soil are sufficient to influence the concentration of barium in groundwater samples, S&ME recommends installing a new monitor well further north of MW-11, closer to the 250-foot compliance boundary. This new monitor well would be located across the creek from the waste disposal area and would be subject to approval by the DWM as a new compliance monitoring point (well).

If a new monitoring well is established to replace MW-5 as the compliance monitoring point along the northeast corner of the landfill, the submersible bladder pump from monitor well MW-5 will need to be removed, decontaminated and re-installed in the new well. The stainless steel portion of the pump removed from MW-5 should be decontaminated and the Teflon tubing and the internal cartridge assembly (including the Teflon bladder) and all other non-metal parts should be replaced prior to re-installation.

## **CLOSING**

S&ME appreciates the opportunity to be of service to the City of Durham and hopes that you find this report to be complete and informative. We would appreciate an opportunity to discuss our findings and recommendations with you. Please call us at (919) 872-2660 if you have any questions or comments.

Sincerely,  
**S&ME, Inc.**



Gerald Paul  
Project Professional



Samuel P. Watts, P.G.  
Senior Project Manager

### Attachments:

- Table 1 - Monitoring Well Construction Information
- Table 2 - Summary of Field Parameters
- Table 3 - Summary of Analytical Results
- Figure 1 - Monitor Well MW-11 Location
- Non-Residential Well Construction Record (Form GW-1b)
- Soil Boring Completion Report
- Photographic Log
- Laboratory Analytical Report

**Table 1**  
**Monitoring Well Construction Information**  
**City of Durham Closed Municipal Solid Waste Landfill**  
**S&ME Project No. 1054-07-469**

<b>Well Identification</b>	<b>Northing</b>	<b>Easting</b>	<b>Ground Surface Elevation (ft AMSL)</b>	<b>TOC Elevation (ft AMSL)</b>	<b>Well Depth* (ft BTOC)</b>	<b>Stick-up Casing (ft.)</b>	<b>Well Diameter (inches)</b>	<b>Screened Interval** (ft bgs)</b>
MW-2	831825.39	2042296.22	283.69	285.65	19.62	1.62	2	9.62 - 19.62
MW-3	830528.59	2041476.86	NM	NM	25.33	1.96	2	15.33 - 25.33
MW-3R	830506.19	2041429.44	282.18	285.19	17.65	3.01	2	7.65 - 17.65
MW-4R	829620.37	2042327.33	291.91	294.48	17.39	2.57	2	7.39 - 17.39
MW-5	832227.33	2043381.02	297.16	298.56	21.77	1.40	2	11.77 - 21.77
MW-6R	830894.58	2041337.35	287.62	290.51	26.72	2.89	2	16.72 - 26.72
MW-7R	831776.91	2043781.93	314.60	317.12	44.01	2.52	2	19.01 - 44.01
MW-8	829819.60	2043596.49	308.24	311.96	16.52	3.72	2	9.02 - 16.52
MW-9R	830699.37	2043831.51	358.03	360.58	22.55	2.55	2	12.55 - 22.55
MW-10	830933.30	2041281.28	280.75	282.81	16.61	2.06	2	6.61-16.61
MW-11***	832284.46	2043303.46	NM	NM	17.72	2.20	2	7.72-17.72
PZ-2R	831132.71	2043504.58	343.12	345.90	34.59	2.78	2	24.59 - 34.59
PZ-3	830577.66	2043455.13	345.71	349.33	42.40	3.62	2	27.40 - 42.40
PZ-4R	830315.48	2043453.65	335.85	338.82	38.38	2.97	2	23.38 - 38.38
PZ-6	831079.74	2043879.27	346.79	349.21	61.50	2.42	2	41.50 - 61.50

**Notes:**

ft AMSL = feet above mean sea level

TOC = top of well casing elevation

-- = no data available

bgs = below ground surface

Monitor well locations and ground surface and TOC elevations surveyed by SEPI Engineering, September 2009.

\*\*\* Location of MW-11 measured by S&ME using a global positioning system (GPS), January 2011.

\*\* Screened interval is approximate, based on field measurements by S&ME in May 2008.

\* Depth to bottom measurements taken on June 13, 2008.

TOC and Ground Surface Elevations surveyed for all wells (except MW-3) by SEPI Engineering in September 2009.

**Table 2**  
**Summary of Field Parameters**  
**City of Durham Closed Municipal Solid Waste Landfill**  
**S&ME Project No. 1054-07-469**

Monitor Well Identification	Field Parameter <sup>4</sup>			
	pH	Conductivity (mS/cm) <sup>1</sup>	Temperature (°C) <sup>2</sup>	Turbidity (NTU) <sup>3</sup>
MW-11	7.71	1.13	12.6	16

**Notes:**

1. mS/cm = microSeimens per centimeter
2. °C = Degrees Celcius
3. NTU = Nephelometric Turbidity Units
4. Groundwater field measurements taken from MW-11 on February 2, 2011

**Table 3**  
**Summary of Analytical Results**  
**City of Durham Closed Municipal Solid Waste Landfill**  
**S&ME Project No. 1054-07-469**

APPENDIX I INORGANIC COMPOUNDS EPA METHOD 6010/6020	UNITS	Groundwater Quality Summary		2L Standard	SWSL
		MW-5* (11/19/2010)	MW-11 (2/2/2011)		
ARSENIC	µg/L	<2.8	<2.8	10	10
BARIUM	µg/L	<b>1,500</b>	<b>1,050</b>	700	100
BERYLLIUM	µg/L	<0.1	<0.1	4*	1
CADMIUM (TOTAL)	µg/L	<0.36	<0.36	2	1
CADMIUM (DISSOLVED)	µg/L	<0.36	<0.36	2	1
CHROMIUM	µg/L	<1.0	<1.0	10	10
COBALT	µg/L	<1.10	<1.10	70*	10
COPPER	µg/L	<1.60	<1.60	1000	10
LEAD	µg/L	<1.90	<1.90	15	10
NICKEL	µg/L	<b>1.89 J</b>	<b>4.39 J</b>	100	50
SELENIUM	µg/L	<b>1.12 J</b>	<b>1.50 J</b>	50	10
THALLIUM (TOTAL)	µg/L	<0.11	<0.11	0.28*	5.5
THALLIUM (DISSOLVED)	µg/L	<0.11	<0.11	0.28*	5.5
VANADIUM	µg/L	<1.40	<1.40	3.5*	25
SILVER	µg/L	<b>2.58 J</b>	<1.90	20	10
ZINC	µg/L	<3.80	<3.80	1000	10

NOTES:

2L Standard = North Carolina groundwater standards as promulgated by 15A North Carolina Administrative Code, Subchapter 2L.

SWSL = Solid Waste Section Limit

µg/L = Micrograms Per Liter

Values which are **BOLDED** and shaded indicate levels above their respective NCDENR 2L or GWPST Standards.

Compounds not shown were not detected during this sampling event.

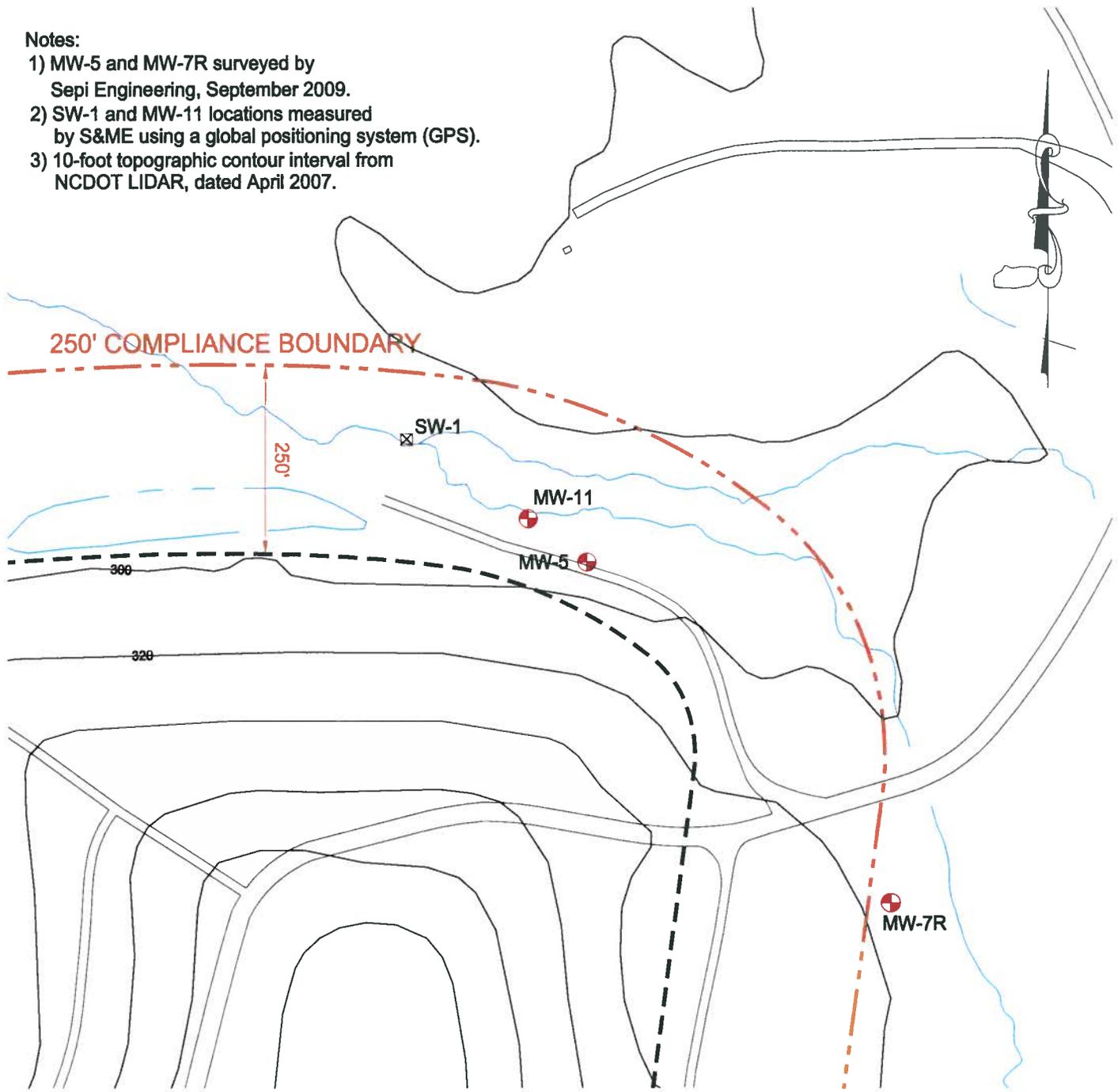
Sample from MW-11 collected on February 2, 2011 and analyzed by Enco. Detection limits are shown on laboratory reports.

NA = Not Analyzed

\* = Analytical results for MW-5 taken from the most recent semi-annual groundwater monitoring event (November 2010).

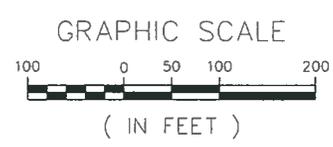
**Notes:**

- 1) MW-5 and MW-7R surveyed by Sepi Engineering, September 2009.
- 2) SW-1 and MW-11 locations measured by S&ME using a global positioning system (GPS).
- 3) 10-foot topographic contour interval from NCDOT LIDAR, dated April 2007.



**LEGEND**

-  MONITOR WELLS
-  SURFACE WATER SAMPLE LOCATIONS
-  CONTOUR LINE - MAJOR (20 FT)
-  250' COMPLIANCE BOUNDARY
-  APPROXIMATE LIMIT OF WASTE



A-2155

SCALE: 1" = 200'
DATE: FEB. 2011
DRAWN BY: BTR
PROJECT NO: 1054-07-469



**S&ME**  
 WWW.SMEINC.COM  
 NC ENGINEER LICENSE #F-0176  
 3201 SPRING FOREST RD, RALEIGH, NC 27616

**MONITOR WELL (MW-11) LOCATION**  
 CLOSED LANDFILL PERMIT #32-01  
 DURHAM, NORTH CAROLINA

FIGURE NO.  
**1**



# NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2907

### 1. WELL CONTRACTOR:

Thomas Whitehead  
Well Contractor (Individual Name)  
S&ME, Inc.  
Well Contractor Company Name  
3201 Spring Forest Road  
Street Address  
Raleigh NC 27616  
City or Town State Zip Code  
(919) 872-2660  
Area code Phone number

### 2. WELL INFORMATION:

WELL CONSTRUCTION PERMIT# \_\_\_\_\_  
OTHER ASSOCIATED PERMIT#(if applicable) \_\_\_\_\_  
SITE WELL ID #(if applicable) MW-11

3. WELL USE (Check One Box) Monitoring  Municipal/Public   
Industrial/Commercial  Agricultural  Recovery  Injection   
Irrigation  Other  (list use) \_\_\_\_\_  
DATE DRILLED 1/21/2011

### 4. WELL LOCATION:

City of Durham Closed Municipal Landfill  
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)  
CITY: Durham COUNTY Durham  
TOPOGRAPHIC / LAND SETTING: (check appropriate box)  
 Slope  Valley  Flat  Ridge  Other \_\_\_\_\_  
LATITUDE 36 ° 2 ' 11.8900 " DMS OR 3X.XXXXXXXX DD  
LONGITUDE 78 ° 51 ' 12.2600 " DMS OR 7X.XXXXXXXX DD  
Latitude/longitude source:  GPS  Topographic map  
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

### 5. FACILITY (Name of the business where the well is located.)

City of Durham Landfill 32-01  
Facility Name Facility ID# (if applicable)  
2115 East Club Blvd.  
Street Address  
Durham NC 27704  
City or Town State Zip Code  
Nancy Newell, P.E.  
Contact Name  
1600 Mist Lake Drive  
Mailing Address  
Durham NC 27704  
City or Town State Zip Code

(919) 560-4381  
Area code Phone number

### 6. WELL DETAILS:

a. TOTAL DEPTH: 17.72  
b. DOES WELL REPLACE EXISTING WELL? YES  NO   
c. WATER LEVEL Below Top of Casing: 9.62 FT.  
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.2 FT. Above Land Surface\*  
\*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): -- METHOD OF TEST --

f. DISINFECTION: Type -- Amount --

g. WATER ZONES (depth):  
Top \_\_\_\_\_ Bottom \_\_\_\_\_ Top \_\_\_\_\_ Bottom \_\_\_\_\_  
Top \_\_\_\_\_ Bottom \_\_\_\_\_ Top \_\_\_\_\_ Bottom \_\_\_\_\_  
Top \_\_\_\_\_ Bottom \_\_\_\_\_ Top \_\_\_\_\_ Bottom \_\_\_\_\_

7. CASING: Depth Diameter Thickness/ Weight Material  
Top +2.2 Bottom 5.52 Ft. 2" sch-40 PVC  
Top \_\_\_\_\_ Bottom \_\_\_\_\_ Ft. \_\_\_\_\_ \_\_\_\_\_  
Top \_\_\_\_\_ Bottom \_\_\_\_\_ Ft. \_\_\_\_\_ \_\_\_\_\_

8. GROUT: Depth Material Method  
Top 0.0 Bottom 3.0 Ft. Cement Free Pour  
Top 3.0 Bottom 4.0 Ft. Bentonite Free Pour  
Top \_\_\_\_\_ Bottom \_\_\_\_\_ Ft. \_\_\_\_\_ \_\_\_\_\_

9. SCREEN: Depth Diameter Slot Size Material  
Top 5.52 Bottom 15.52 Ft. 2 in. .010 in. PVC  
Top \_\_\_\_\_ Bottom \_\_\_\_\_ Ft. \_\_\_\_\_ in. \_\_\_\_\_ in. \_\_\_\_\_  
Top \_\_\_\_\_ Bottom \_\_\_\_\_ Ft. \_\_\_\_\_ in. \_\_\_\_\_ in. \_\_\_\_\_

10. SAND/GRAVEL PACK: Depth Size Material  
Top 4.0 Bottom 15.52 Ft. #2 Silica  
Top \_\_\_\_\_ Bottom \_\_\_\_\_ Ft. \_\_\_\_\_ \_\_\_\_\_  
Top \_\_\_\_\_ Bottom \_\_\_\_\_ Ft. \_\_\_\_\_ \_\_\_\_\_

11. DRILLING LOG  
Top Bottom Formation Description  
0 / 2 Brown Silty Sand  
2 / 5 Tan Silty Sand  
5 / 6 Tan Silty Clay w/sand  
6 / 7 Tan Silty Clay  
7 / 13 Dark Red Silty Clay  
13 / 15.52 Red Silty Clay (hard)  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### 12. REMARKS:

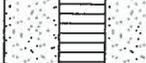
I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Thomas Whitehead 4/19/11  
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Thomas Whitehead  
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

# COMPLETION REPORT OF TEMPORARY WELL NO. MW-11

PROJECT: <b>City of Durham Closed MSWL</b>	APPROXIMATE ELEVATION: <b>2.2</b>
PROJECT NO: <b>1054-07-469 P23</b>	BORING DEPTH (FT.): <b>15.5</b>
PROJECT LOCATION: <b>Durham, North Carolina</b>	LOGGED BY: <b>JP</b>
DRILLING CONTRACTOR: <b>S&amp;ME</b>	
DRILLING METHOD: <b>4 1/4" H.S.A.</b>	
DATE DRILLED: <b>1/21/2011</b>	

STRATA		SYMBOL	DEPTH (feet)	WELL DETAILS	DEPTH (feet)	LEGEND	ELEVATION (feet)	PID	WELL CONSTRUCTION DETAILS
DESCRIPTION									
Ground Surface			0.0				2.20		<b>PROTECTIVE CASING</b> Diameter: 4" Type: <b>steel</b> Interval: 2.2
Brown silty SAND					1.4				<b>OUTER CASING</b> Diameter: Type: Length:
Tan silty SAND					3.4		-2.80		<b>RISER CASING</b> Diameter: 2" Type: <b>PVC</b> Interval: 0 - 5.4
Tan silty clay with SAND			5.0						<b>GROUT</b> Type: <b>Cement</b> Interval: 0 - 2.4
Tan silty CLAY							-7.80		<b>SEAL</b> Type: <b>Bentonite</b> Interval: 2.4 - 3.4
Dark red silty CLAY			10.0						<b>FILTERPACK</b> Type: <b>No. 2 Filter Sand</b> Interval: 3.4 - 15.5
Red silty CLAY (hard)			15.0		15.4		-12.80		<b>SCREEN</b> Diameter: 2" Type: <b>PVC</b> Interval: 5.4 - 15.4
			15.0		15.5				<b>LEGEND</b> ∇ = Water Level At Termination of Boring (TOB) ▼ = Water Level After ~24 Hours BS = Bentonite Seal FP = Filter Pack CG = Cement Grout BSC = Bottom of Screen REC = Core Recovery RQD = Rock Quality Designation

NOTES:



3201 Spring Forest Road  
Raleigh, NC 27616



**1** S&ME drillers installing monitor well MW-11 (facing west).



**2** Soil cuttings from approximately seven feet below ground surface (dark, red, silty clay).



**3** Completed monitor well MW-11 (facing north).



**4** Location of MW-11 near the intermittent creek (facing north).



**Environmental Conservation Laboratories, Inc.**

102-A Woodwinds Industrial Court

Cary NC, 27511

Phone: 919.467.3090 FAX: 919.467.3515



www.encolabs.com

Monday, February 14, 2011

S&ME, Inc. (SM001)

Attn: Gerald Paul

3201 Spring Forest Road

Raleigh, NC 27616

**RE: Laboratory Results for**

**Project Number: 1054-07-469, Project Name/Desc: City of Durham C&D LF**

**ENCO Workorder: C101210**

Dear Gerald Paul,

Enclosed is a copy of your laboratory report for test samples received by our laboratory on Wednesday, February 2, 2011.

Unless otherwise noted in an attached project narrative, all samples were received in acceptable condition and processed in accordance with the referenced methods/procedures. Results for these procedures apply only to the samples as submitted.

The analytical results contained in this report are in compliance with NELAC standards, except as noted in the project narrative. This report shall not be reproduced except in full, without the written approval of the Laboratory.

This report contains only those analyses performed by Environmental Conservation Laboratories. Unless otherwise noted, all analyses were performed at ENCO Cary. Data from outside organizations will be reported under separate cover.

If you have any questions or require further information, please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink that reads 'Chuck Smith'. The signature is written in a cursive, flowing style.

Chuck Smith

Project Manager

Enclosure(s)



www.encolabs.com

**SAMPLE SUMMARY/LABORATORY CHRONICLE**

<b>Client ID:</b> MW-11	<b>Lab ID:</b> C101210-01	<b>Sampled:</b> 02/02/11 17:20	<b>Received:</b> 02/02/11 18:35
<b>Parameter</b>	<b>Hold Date/Time(s)</b>	<b>Prep Date/Time(s)</b>	<b>Analysis Date/Time(s)</b>
EPA 6010C	08/01/11	02/07/11 11:30	2/9/2011 12:10
EPA 6020A	08/01/11	02/07/11 11:44	2/10/2011 13:03



www.encolabs.com

**NORTH CAROLINA SWS SAMPLE DETECTION SUMMARY**

Client ID: MW-11		Lab ID: C101210-01							
Analyte	Results	Flag	DF	MDL	MRL	NC SWSL	Units	Method	Notes
Barium - Total	1050		1	1.00	10.0	100	ug/L	EPA 6010C	
Nickel - Total	4.39	J	1	1.80	10.0	50	ug/L	EPA 6010C	
Selenium - Total	1.50	J	1	0.830	1.00	10	ug/L	EPA 6020A	



www.encolabs.com

**ANALYTICAL RESULTS**

**Description:** MW-11

**Lab Sample ID:** C101210-01

**Received:** 02/02/11 18:35

**Matrix:** Water

**Sampled:** 02/02/11 17:20

**Work Order:** C101210

**Project:** City of Durham C&D LF

**Sampled By:** Gerald Paul

**Metals (total recoverable) by EPA 6000/7000 Series Methods**

^ - ENCO Cary certified analyte [NC 591]

<u>Analyte [CAS Number]</u>	<u>Results</u>	<u>Flag</u>	<u>Units</u>	<u>DF</u>	<u>MDL</u>	<u>MRL</u>	<u>NC SWSL</u>	<u>Method</u>	<u>Analyzed</u>	<u>By</u>	<u>Notes</u>
Antimony [7440-36-0] ^	0.220	U	ug/L	1	0.220	2.00	6	EPA 6020A	02/10/11 13:03	VLO	
Arsenic [7440-38-2] ^	2.80	U	ug/L	1	2.80	10.0	10	EPA 6010C	02/09/11 12:10	JDH	
<b>Barium [7440-39-3] ^</b>	<b>1050</b>		ug/L	1	1.00	10.0	100	EPA 6010C	02/09/11 12:10	JDH	
Beryllium [7440-41-7] ^	0.100	U	ug/L	1	0.100	1.00	1	EPA 6010C	02/09/11 12:10	JDH	
Cadmium [7440-43-9] ^	0.360	U	ug/L	1	0.360	1.00	1	EPA 6010C	02/09/11 12:10	JDH	
Chromium [7440-47-3] ^	1.00	U	ug/L	1	1.00	10.0	10	EPA 6010C	02/09/11 12:10	JDH	
Cobalt [7440-48-4] ^	1.10	U	ug/L	1	1.10	10.0	10	EPA 6010C	02/09/11 12:10	JDH	
Copper [7440-50-8] ^	1.60	U	ug/L	1	1.60	10.0	10	EPA 6010C	02/09/11 12:10	JDH	
Lead [7439-92-1] ^	1.90	U	ug/L	1	1.90	10.0	10	EPA 6010C	02/09/11 12:10	JDH	
<b>Nickel [7440-02-0] ^</b>	<b>4.39</b>	J	ug/L	1	1.80	10.0	50	EPA 6010C	02/09/11 12:10	JDH	
<b>Selenium [7782-49-2] ^</b>	<b>1.50</b>	J	ug/L	1	0.830	1.00	10	EPA 6020A	02/10/11 13:03	VLO	
Silver [7440-22-4] ^	1.90	U	ug/L	1	1.90	10.0	10	EPA 6010C	02/09/11 12:10	JDH	
Thallium [7440-28-0] ^	0.110	U	ug/L	1	0.110	1.00	5.5	EPA 6020A	02/10/11 13:03	VLO	
Vanadium [7440-62-2] ^	1.40	U	ug/L	1	1.40	10.0	25	EPA 6010C	02/09/11 12:10	JDH	
Zinc [7440-66-6] ^	3.80	U	ug/L	1	3.80	10.0	10	EPA 6010C	02/09/11 12:10	JDH	

This report relates only to the sample as received by the laboratory, and may only be reproduced in full.



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**QUALITY CONTROL**

**Metals (total recoverable) by EPA 6000/7000 Series Methods - Quality Control**

Batch 1B07015 - EPA 3005A

**Blank (1B07015-BLK1)**

Prepared: 02/07/2011 11:30 Analyzed: 02/09/2011 10:49

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	2.80	U	10.0	ug/L							
Barium	1.00	U	10.0	ug/L							
Beryllium	0.100	U	1.00	ug/L							
Cadmium	0.360	U	1.00	ug/L							
Chromium	1.00	U	10.0	ug/L							
Cobalt	1.10	U	10.0	ug/L							
Copper	1.60	U	10.0	ug/L							
Lead	1.90	U	10.0	ug/L							
Nickel	1.80	U	10.0	ug/L							
Silver	1.90	U	10.0	ug/L							
Vanadium	1.40	U	10.0	ug/L							
Zinc	3.80	U	10.0	ug/L							

**LCS (1B07015-BS1)**

Prepared: 02/07/2011 11:30 Analyzed: 02/09/2011 11:03

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	529		10.0	ug/L	500		106	80-120			
Barium	532		10.0	ug/L	500		106	80-120			
Beryllium	269		1.00	ug/L	250		108	80-120			
Cadmium	264		1.00	ug/L	250		106	80-120			
Chromium	534		10.0	ug/L	500		107	80-120			
Cobalt	525		10.0	ug/L	500		105	80-120			
Copper	266		10.0	ug/L	250		107	80-120			
Lead	533		10.0	ug/L	500		107	80-120			
Nickel	531		10.0	ug/L	500		106	80-120			
Silver	262		10.0	ug/L	250		105	80-120			
Vanadium	258		10.0	ug/L	250		103	80-120			
Zinc	533		10.0	ug/L	500		107	80-120			

**Matrix Spike (1B07015-MS1)**

Prepared: 02/07/2011 11:30 Analyzed: 02/09/2011 11:10

Source: C100700-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	559		10.0	ug/L	500	29.1	106	75-125			
Barium	570		10.0	ug/L	500	61.1	102	75-125			
Beryllium	268		1.00	ug/L	250	0.100 U	107	75-125			
Cadmium	253		1.00	ug/L	250	0.360 U	101	75-125			
Chromium	514		10.0	ug/L	500	1.00 U	103	75-125			
Cobalt	528		10.0	ug/L	500	1.10 U	106	75-125			
Copper	269		10.0	ug/L	250	2.23	107	75-125			
Lead	512		10.0	ug/L	500	1.90 U	102	75-125			
Nickel	514		10.0	ug/L	500	3.29	102	75-125			
Silver	254		10.0	ug/L	250	1.90 U	102	75-125			
Vanadium	255		10.0	ug/L	250	1.40 U	102	75-125			
Zinc	528		10.0	ug/L	500	3.80 U	106	75-125			

**Matrix Spike Dup (1B07015-MSD1)**

Prepared: 02/07/2011 11:30 Analyzed: 02/09/2011 11:12



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**QUALITY CONTROL**

**Metals (total recoverable) by EPA 6000/7000 Series Methods - Quality Control**

Batch 1B07015 - EPA 3005A

**Matrix Spike Dup (1B07015-MSD1) Continued**

Prepared: 02/07/2011 11:30 Analyzed: 02/09/2011 11:12

Source: C100700-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	565		10.0	ug/L	500	29.1	107	75-125	1	20	
Barium	572		10.0	ug/L	500	61.1	102	75-125	0.4	20	
Beryllium	269		1.00	ug/L	250	0.100 U	108	75-125	0.6	20	
Cadmium	254		1.00	ug/L	250	0.360 U	102	75-125	0.5	20	
Chromium	516		10.0	ug/L	500	1.00 U	103	75-125	0.4	20	
Cobalt	532		10.0	ug/L	500	1.10 U	106	75-125	0.7	20	
Copper	270		10.0	ug/L	250	2.23	107	75-125	0.3	20	
Lead	516		10.0	ug/L	500	1.90 U	103	75-125	0.7	20	
Nickel	514		10.0	ug/L	500	3.29	102	75-125	0.08	20	
Silver	256		10.0	ug/L	250	1.90 U	102	75-125	0.4	20	
Vanadium	255		10.0	ug/L	250	1.40 U	102	75-125	0.2	20	
Zinc	512		10.0	ug/L	500	3.80 U	102	75-125	3	20	

**Post Spike (1B07015-PS1)**

Prepared: 02/07/2011 11:30 Analyzed: 02/09/2011 11:14

Source: C100700-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	1.09		0.0100	mg/L	1.00	0.0291	106	80-120			
Barium	1.09		0.0100	mg/L	1.00	0.0611	102	80-120			
Beryllium	0.537		0.00100	mg/L	0.500	-8.88E-5	107	80-120			
Cadmium	0.510		0.00100	mg/L	0.500	-0.000176	102	80-120			
Chromium	1.05		0.0100	mg/L	1.00	-0.000361	105	80-120			
Cobalt	1.02		0.0100	mg/L	1.00	0.000794	102	80-120			
Copper	0.546		0.0100	mg/L	0.500	0.00223	109	80-120			
Lead	1.03		0.0100	mg/L	1.00	-0.00202	103	80-120			
Nickel	1.02		0.0100	mg/L	1.00	0.00329	102	80-120			
Silver	0.508		0.0100	mg/L	0.500	0.000967	101	80-120			
Vanadium	0.518		0.0100	mg/L	0.500	-7.68E-5	104	80-120			
Zinc	1.02		0.0100	mg/L	1.00	0.00298	102	80-120			

Batch 1B07017 - EPA 3005A

**Blank (1B07017-BLK1)**

Prepared: 02/07/2011 11:44 Analyzed: 02/10/2011 12:05

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Antimony	0.220	U	2.00	ug/L							
Selenium	0.830	U	1.00	ug/L							
Thallium	0.110	U	1.00	ug/L							

**LCS (1B07017-BS1)**

Prepared: 02/07/2011 11:44 Analyzed: 02/10/2011 12:09

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Antimony	23.6		2.00	ug/L	25.0		94	80-120			
Selenium	23.2		1.00	ug/L	25.0		93	80-120			
Thallium	22.9		1.00	ug/L	25.0		92	80-120			



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### QUALITY CONTROL

#### Metals (total recoverable) by EPA 6000/7000 Series Methods - Quality Control

Batch 1B07017 - EPA 3005A

##### Matrix Spike (1B07017-MS1)

Prepared: 02/07/2011 11:44 Analyzed: 02/10/2011 12:16

Source: C015890-02

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Antimony	23.5		2.00	ug/L	25.0	0.220 U	94	75-125			
Selenium	26.4		1.00	ug/L	25.0	0.943	102	75-125			
Thallium	23.6		1.00	ug/L	25.0	0.110 U	94	75-125			

##### Matrix Spike Dup (1B07017-MSD1)

Prepared: 02/07/2011 11:44 Analyzed: 02/10/2011 12:20

Source: C015890-02

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Antimony	23.3		2.00	ug/L	25.0	0.220 U	93	75-125	0.9	20	
Selenium	25.6		1.00	ug/L	25.0	0.943	99	75-125	3	20	
Thallium	23.2		1.00	ug/L	25.0	0.110 U	93	75-125	2	20	

##### Post Spike (1B07017-PS1)

Prepared: 02/07/2011 11:44 Analyzed: 02/10/2011 12:23

Source: C015890-02

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Antimony	25.1		2.00	ug/L	25.0	-0.0210	101	80-120			
Selenium	27.4		1.00	ug/L	25.0	0.943	106	80-120			
Thallium	24.5		1.00	ug/L	25.0	0.0690	98	80-120			

**FLAGS/NOTES AND DEFINITIONS**

B	The analyte was detected in the associated method blank.
D	The sample was analyzed at dilution.
J	The reported value is between the laboratory method detection limit (MDL) and the laboratory method reporting limit (MRL), adjusted for actual sample preparation data and moisture content, where applicable.
U	The analyte was analyzed for but not detected to the level shown, adjusted for actual sample preparation data and moisture content, where applicable.
E	The concentration indicated for this analyte is an estimated value above the calibration range of the instrument. This value is considered an estimate.
MRL	Method Reporting Limit. The MRL is roughly equivalent to the practical quantitation limit (PQL) and is based on the low point of the calibration curve, when applicable, sample preparation factor, dilution factor, and, in the case of soil samples, moisture content.

