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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).
- 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):

Golder Associates NC, Inc. on behalf of Randolph County

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

Name: David Y. Reedy, P.G. Phone: (336) 852-4903

E-mail: dreedy@golder.com

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)
Closed Randolph County Landfill	1254 County Land Road Asheboro, NC	76-01	.1600	April 11-13, 29, 2011

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
☐ Groundwater monitoring data from private water supply wells
☐ Leachate monitoring data
☐ Surface water monitoring data
☐ Methane gas monitoring data
☒ Corrective action data (specify) Headspace gas samples from MWs
☐ Other(specify)

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.

David Y. Reedy, P.G. | Senior Project Hydrogeologist | (336) 852-4903

Facility Representative Name (Print) | Title | (Area Code) Telephone Number

Signature | 4-12-13 Date

Affix NC Licensed/ Professional Geologist Seal

Golder Associates NC, Inc., 5B Oak Branch Drive, Greensboro, NC 27407

Facility Representative Address

C-2862

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

Revised 6/2009

NATURE AND EXTENT STUDY

NATURE AND EXTENT STUDY: DETECTIONS OF VOLATILE ORGANIC COMPOUNDS IN GROUNDWATER

Closed Randolph County Municipal Solid Waste Landfill, Permit No. 76-01

Submitted To:

Randolph County Public Works
P.O. Box 4728
Asheboro, NC 27204

Submitted By: Golder Associates NC, Inc.
5B Oak Branch Drive
Greensboro, NC 27407

April 2013 **0739-612712.500**

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April 12, 2013 0739-612712.500

Mr. Ervin Lane, Hydrogeologist
North Carolina Department of Environment and Natural Resources
Division of Waste Management Solid Waste Section
1646 Mail Service Center
Raleigh, NC 27699-1646

RE: NATURE AND EXTENT STUDY: DETECTIONS OF VOLATILE ORGANIC COMPOUNDS CLOSED RANDOLPH COUNTY LANDFILL, PERMIT NO. 76-01 RANDOLPH COUNTY, NORTH CAROLINA

Dear Mr. Lane:

On behalf of Randolph County, Golder Associates NC, Inc. (Golder) is submitting the attached Nature and Extent Study (NES) in response to confirmed exceedances of NC 2L Drinking Water Standards (NC 2L Standards) for NC Appendix II parameters in groundwater samples at the above-referenced facility. The attached NES is submitted to comply with the requirements of Title 15A of the North Carolina Administrative Code (NCAC) Subchapter 13B.1634(g)(1)(A), which require Randolph County to characterize the nature and extent of the release as a result of confirmed NC 2L Standard exceedances detected in samples collected from compliance monitoring wells at the site.

Upon approval of this submittal, the County will initiate the Assessment of Corrective Measures component of the corrective action regulations. If you have any questions regarding the NES, please contact the undersigned at (336) 852-4903.

Sincerely,

GOLDER ASSOCIATES NC, INC.

David "Dusty" Y. Reedy II, P.G.
Senior Project Hydrogeologist

Rachel P. Kirkman, P.G.
Associate and Senior Geologist

Enclosure: Nature and Extent Study: Detections of Volatile Organic Compounds, Closed Randolph County Landfill, Permit No. 76-01

C: Paxton Arthurs, P.E., Randolph County Public Works Director, 725 McDowell Road, Asheboro, NC, 27205. 336-318-6605.

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Golder Associates NC, Inc.
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Tel: (336) 852-4903 Fax: (336) 852-4904 www.golder.com

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1.0 INTRODUCTION

Randolph County owns and maintains the closed Randolph County Landfill, a closed municipal solid waste (MSW) landfill, under Permit No. 76-01 issued by the North Carolina Department of Environment and Natural Resources (NC DENR). The MSW facility is subject to Assessment Monitoring in accordance with .1634 of the Solid Waste Management Rules (SWMR) and the Transition Plan (H&S, 1994) for the facility. Pursuant to the Assessment Monitoring requirements, groundwater is sampled from a permitted network of compliance wells and analyzed for a suite of solid waste constituents referred to as the NC Appendix II parameters. Should any reported detections exceed applicable regulatory standards, the facility advances into the corrective action requirements of the SWMR. This Nature and Extent Study (NES) has been prepared on behalf of Randolph County to meet the corrective action requirements of Title 15A of the North Carolina Administrative Code (NCAC) Subchapter 13B.1634(g)(1)(A),

1.1 Objective

Title 15A of the NCAC Subchapter 13B.1634(g)(1)(A) requires Randolph County to characterize the nature and extent of the detected release of solid waste constituents as a result of confirmed exceedances of NC 2L Drinking Water Standards (NC 2L Standards) for NC Appendix II parameters reported in samples from compliance monitoring wells at the site. The purpose of this NES is to delineate the vertical and horizontal extent of those constituents detected in the groundwater samples at concentrations that exceed their respective groundwater standards.

1.2 Background and Site Description

The location of the facility is shown on the inlay on Drawing 1. As presented, the Randolph County Landfill is located approximately 3 miles northeast of the city of Asheboro, near the town of Central Falls in Randolph County, NC, off County Land Road. Randolph County operated a MSW landfill from 1973 to 1985, and operated a second landfill for MSW, construction and demolition (C&D) debris, and land clearing and inert debris (LCID) from 1985 to December 31, 1997. The total facility comprises approximately 600 acres, approximately half of which contain landfilled waste or are associated with waste management activities at the active customer convenience area and solid waste transfer station, operated by Republic Services. The transfer station was built before final landfill closure in 1997, and remains in operation. Monitoring wells for the second unlined MSW facility have been sampled since 1987. Since this facility operated past October 9, 1993, the landfill is subject to Title 15A NCAC 13B.1630-37 of the NC SWMR. This landfill is the subject of this NES.

As shown on Drawing 1, the landfill is accessible by County Land Road to the southwest. The landfill is bounded to the north by the Deep River and to the west, south, and east by residential and undeveloped wooded properties. Topographic relief at the landfill ranges from approximately 580 to 725 feet above mean sea level. Surface drainage from the facility is toward perennial streams to the west and east of the waste unit. Both of these features drain into the Deep River to the north of the landfill (H&S, 1994).

Monitoring wells for the second landfill have been sampled since 1987. Due to detections of volatile organic compounds (VOCs) in groundwater samples at concentrations above applicable standards, the facility has been in the Assessment Monitoring Program since 1996. The current monitoring system consists of six monitoring wells (MW-1, MW-5, MW-6, MW-7, MW-8, and MW-9). Four surface water monitoring points (SW-1, SW-2, SW-3, and SW-4) are also monitored in accordance with the Water Quality Monitoring Plan (WQMP) detailed in the facility's Transition Plan, dated October 8, 1994, and approved by NC DENR in 1995.

Based on the documented VOC exceedances of applicable groundwater standards, the County submitted a *Groundwater Assessment Workplan (Workplan)* to NC DENR on December 15, 2009. NC DENR approved the *Workplan* on January 15, 2010.

2.0 NATURE AND EXTENT INVESTIGATION

The field portion of the NES investigation of the release from the landfill was conducted in December 2010 through April 2011. NES report preparation, scope, and field activities are discussed in the following sections.

2.1 Report Preparation

This report has been prepared by Golder Associates NC, Inc. (Golder) of Greensboro, North Carolina, and is being submitted to NC DENR on behalf of Randolph County to satisfy the requirements of Title 15A NCAC Subchapter 13B.1634(g)(1). This NES report presents the methodology used to obtain the necessary data, evaluations of the results, delineation of the plumes, a description of the constituents-of-concern (COCs), and conclusions and recommendations.

2.2 Purpose and Methods

The purpose of this report is to present the findings of the site investigation that was performed to delineate VOCs detected in samples from monitoring wells MW-1 and MW-7 at concentrations above the Solid Waste Section Limits (SWSLs) and the NC 2L Standards. Two NC Appendix I inorganic compounds (arsenic and cobalt) have been detected in recent samples from MW-1at concentrations above their respective SWSLs and groundwater protection standards. The detections are interpreted as naturally occurring and are not addressed in this NES. The investigation consisted of the following activities:

- Install a nested pair of monitoring wells (MW-10S and MW-10D) downgradient of MW-1, and install a nested pair of wells (MW-11S and MW-11D) downgradient of MW-7
- Develop and slug test newly installed monitoring wells MW-10S, MW-10D, MW-11S, and MW-11D
- Collect monitoring well headspace gas samples from wells MW-1, MW-7, and MW-8 for analysis of VOCs

- Sample groundwater from compliance monitoring wells (MW-1, MW-5, MW-6, MW-7, MW-8, and MW-9) for analysis of the NC Appendix II constituents and monitored natural attenuation (MNA) evaluation parameters
- Sample groundwater from non-compliance monitoring wells (MW-2, MW-10S, MW-10D, MW-11S, and MW-11D) for analysis of the NC Appendix I constituents and MNA evaluation parameters
- Sample surface water locations (SW-1, SW-2, SW-3, and SW-4) for analysis of NC Appendix I constituents
- Delineate the extent and document the concentrations of total VOCs and individual COCs

2.3 Field Activities

Monitoring wells MW-10S, MW-10D, MW-11S, and MW-11D were installed in December 2010. MNA parameters were collected from the compliance monitoring wells in April 2011 during the routine semi-annual water quality monitoring event. Existing non-compliance well MW-2 and the newly installed non-compliance wells MW-10S, MW-10D, MW-11S, and MW-11D were sampled and analyzed for the NC Appendix I list of parameters and MNA parameters during the April 2011 event. Headspace gas samples from monitoring wells MW-1, MW-7, and MW-8 were also collected during the event and analyzed for VOCs. A summary of the field activities is presented in the following sections.

2.3.1 Monitoring Well Installation, Development, and Aquifer Testing

A nested pair of monitoring wells (MW-10S and MW-10D) was installed downgradient of MW-1, and a nested pair of wells (MW-11S and MW-11D) was installed downgradient of MW-7 on December 1-9, 2010. South Atlantic Environmental Drilling and Construction Company of Fort Mill, South Carolina performed the drilling and well installation activities. The drilling equipment consisted of Gus Pech Brat and Brute truck-mounted drilling rigs equipped with 4.25-inch inner diameter (ID) hollow-stem augers and a 5.75-inch outer diameter (OD) downhole hammer. An experienced Golder geologist was present to observe the drilling, log the boreholes, and supervise the monitoring well construction. Split-spoon samples collected on 5-foot centers were obtained and logged by the geologist for all of the boreholes, except in locations where nested piezometer pairs were installed, in which case split-spoon samples were not taken in the duplicated sections of the boreholes. The monitoring well construction data for the new and existing monitoring wells are summarized in Table 1 and the locations are provided on Drawing 1. The boring logs and well construction diagrams are presented in Appendix A. Piezometer construction was performed in accordance with the standards described in the *RCRA Technical Enforcement Guidance Document* (1986*)* and the *Draft North Carolina Water Quality Monitoring Guidance Document for Solid Waste Facilities* (1995*)*.

Monitoring well MW-10S was installed with the screened interval completely in saprolite, and MW-11S was installed with the screened interval in saprolite and partially weathered rock (PWR). These monitoring wells were both installed to a depth of 25 feet below ground surface (bgs), with screen lengths of 15 and 10 feet, respectively. Wells MW-10D and MW-11D were installed with screened intervals in bedrock. These monitoring wells were installed to depths of 73 feet and 65 feet bgs, respectively, each

with screen lengths of 10 feet. Monitoring wells were grouted to the surface and were covered by lockable anodized aluminum protective casings installed into 3x3x0.5-foot concrete aprons to protect their integrity.

On February 8 and 9, 2011, the newly installed monitoring wells were developed with a submersible pump and/or bailer to remove accumulated sediments resulting from the drilling and construction process, and to hydraulically connect the monitoring wells with the aquifer. The monitoring well development forms are presented in Appendix B. Because of the variable yields from the wells, purge volumes varied from approximately 31 gallons to 84 gallons.

The newly installed monitoring wells were surveyed on January 27, 2011, by Dan Brown Surveying of Asheboro, North Carolina. Elevations and horizontal locations were referenced to the N.C. Grid Coordinate System. The sealed monitoring well survey is provided in Appendix C.

Aquifer testing (slug testing) was performed on the newly installed monitoring wells on February 14, 2011, by Golder field representatives. The purpose of the testing was to estimate the horizontal hydraulic conductivity of aquifer materials encountered at the site. *In situ* rising- and falling-head slug tests were chosen for the assessment due to the relatively low well yields noted during well installation and development.

Falling- and rising-head tests were performed on the four newly installed monitoring wells. Prior to slug testing, the wells were opened and groundwater levels were allowed to equilibrate. Groundwater level measurements were then measured using an electronic water level indicator referenced to a surveyed point on the top of the casing. A 15 or 30 pounds per square inch (psi) pressure transducer was lowered inside the well casing and placed approximately 10 to 15 feet below the top of the water table. A polyvinyl chloride (PVC) slug measuring 5 feet in length was then used to displace water inside the well.

The first portion of the test was a falling-head test that measured the rate water levels fell back to static levels after the insertion of the PVC slug. The pressure transducer was programmed to record changes in groundwater level at logarithmic time intervals. Changes in groundwater levels were also measured with hand-held electronic water level indicators to field-verify the data collected by the transducer. Falling-head tests were terminated after water levels had recovered to within at least 99% of their pre-test level. A rising-head test was performed on each well after the falling-head test was completed. The rising-head test was performed with the same methodology as the falling-head test, with the exception that the PVC slug was removed simultaneously with the start of the test.

In situ rising- and falling-head tests provide a quantitative estimate of horizontal hydraulic conductivity and a qualitative estimate of aquifer anisotropy in water-bearing units. The slug test data were analyzed using the Bouwer and Rice (1976 and 1989) equation, which is applicable to fully or partially penetrating wells in unconfined or confined aquifers. Monitoring well-specific aquifer thicknesses of approximately 18.5 to

18.7 feet were assumed for wells MW-10S and MW-11S, respectively, which are screened in the unconsolidated aquifer. An aquifer thickness of 100 feet was assumed for the bedrock portion of the aquifer. The computer software program AQTESOLV, produced by HydroSOLVE, Inc., was used to assist in the analysis and plotting of data. The individual data points and computer plots of time versus groundwater displacement are presented in Appendix D. A summary of the aquifer testing and the calculated geometric mean for hydraulic conductivity for each of the hydrogeologic units are presented in Table 2. The rising-head test results for well MW-10S have been omitted from Appendix D and Table 2 because the results are considered suspect.

2.3.2 Groundwater, Surface Water, and Headspace Gas Sampling

Personnel from Golder visited the facility on April 11-13, 2011, and on April 29, 2011, to perform the routine semi-annual compliance monitoring event. Additional sampling was performed for the NES during the event. During the event, six compliance monitoring wells (MW-1, MW-5, MW-6, MW-7, MW-8, and MW-9), four newly installed monitoring wells (MW-10S, MW-10D, MW-11S, and MW-11D), and one non-compliance monitoring well (MW-2) were purged and sampled, and four surface water monitoring points (SW-1, SW-2, SW-3, and SW-4) were sampled. Depth-to-water measurements were obtained from the monitoring wells to the nearest 0.01 foot using an electronic water level indicator prior to purging the wells.

The wells were purged and sampled using micropurge procedures with a decontaminated, portable bladder pump or peristaltic pump. Measurements of pH, specific conductivity, dissolved oxygen, oxidation-reduction potential, temperature, and turbidity were recorded on approximately 3- to 4-minute intervals during the purging process, depending on the purge rate. In general, the purge rate for each well was matched to the yield of the monitoring well, as determined by periodically monitoring the depth to water, up to a maximum purge rate of 500 milliliters per minute. Purging was continued until stabilization was indicated by the geochemical field parameters.

During the purging process, 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 samples were collected directly from the pump tubing in the labeled, laboratory-supplied, pre-preserved sample containers after purging was completed.

The surface water samples were collected directly from the stream by lowering the sample containers into the stream flow with the opening facing away from the current flow, taking care to prevent the overflow of the sample containers and to minimize sample-induced turbidity. Measurements of temperature, pH, specific conductivity, and turbidity were recorded in the stream sampling location during the collection of the surface water samples.

The samples were placed in a cooler on ice, under chain-of-custody control. Copies of the sampling logs are presented in Appendix E. Included in each log is a description of the sampling equipment, sampling location, sampling method, field observations, and water quality measurements.

The April 2011 groundwater and surface water samples were shipped to Environmental Conservation Laboratories, Inc. (ENCO) of Cary, NC and Microseeps of Pittsburgh, Pennsylvania under chain-of-custody control. The samples were received at the laboratories on April 12, 13, 14, 18, and 30, 2011, in good condition and properly preserved. Groundwater samples from the compliance monitoring wells were analyzed for the NC Appendix II list and MNA parameters (sulfide, chloride, nitrate, sulfate, total alkalinity, total organic carbon, ethane, ethene, methane, carbon dioxide, volatile fatty acids, and hydrogen). Groundwater samples from the non-compliance monitoring wells were analyzed for the NC Appendix I VOCs and MNA parameters. Surface water samples were analyzed for the NC Appendix I list of constituents.

As part of the NES, headspace samples were collected from MW-1, MW-7, and MW-8 using Summa canisters on April 12, 2011, by personnel from Golder. To collect headspace samples, each monitoring well was plugged to prevent potential gas from escaping from the well. Tubing was inserted into the well to a depth of approximately 5 feet above the groundwater level. The tubing was attached to an empty Summa canister and the valve of the canister was opened and allowed to fill with the gases from the well headspace. Once full, the valve to the Summa canister was closed and the tubing was removed. The Summa canisters were shipped by courier to ENCO of Jacksonville, Florida, for analysis of VOCs.

3.0 GEOLOGY AND HYDROGEOLOGY

The sections below describe the geology and hydrogeology of the site as it relates to this study.

3.1 Geology

Geologically, the facility is located within the Carolina Slate Belt of the Piedmont Physiographic Province of North Carolina. The Carolina Slate Belt is composed of Late Proterozoic to Cambrian meta-sedimentary and meta-volcanic rocks that locally have been intruded by diabase dikes and felsic intrusive suites (NCGS, 1985). The facility is underlain primarily by felsic meta-volcanic tuffs with massive fabrics to steeply dipping foliations (GSA, 2008). STS Consultants Ltd. conducted a geologic and hydrogeologic investigation as part of the Phase II Landfill Expansion in late 1984 and 1985 (H&S, 1994). The topography of the area is characterized by rolling, rounded hills and flat valleys with sharp draws containing streams and ponds. The site geology consists of residual soils weathered from bedrock or saprolite. The saprolite generally consists of clayey silts and silty clays, with some sandy silts and silty sands (H&S, 1994).

3.2 Aquifer Characterization

The uppermost groundwater beneath the facility is present in a shallow, unconfined aquifer comprised of partially weathered, fractured, meta-volcanic rock. As a result of the rolling topography, groundwater occurs at depths ranging from approximately 4 to 25 feet below grade. Depth-to-water measurements obtained during the April 2011 monitoring event are summarized in Table 3 and were used to prepare a groundwater surface contour map presented as an overlay on Drawing 1.

As presented, the groundwater flow in the uppermost aquifer beneath the site is generally north toward the Deep River, which is located along the northern property boundary of the site. Based on the April 2011 groundwater surface contour map, the average hydraulic gradient in the shallow aquifer underlying the site was calculated to be approximately 0.058 foot/foot (Table 4). Based on a local hydrogeologic investigation, a hydraulic conductivity of 2.75E-04 centimeters/second was used in linear groundwater velocity calculations (GSA, 2008). An estimated effective porosity of 0.15 was used for the shallow aquifer to represent a range from saprolite to fractured rock (H&S, 1997).

Using the above values, the estimated rate of horizontal groundwater flow for the uppermost aquifer beneath the facility was calculated using the following modified Darcy equation:

$$V_{gw} = Ki/n_e$$

where V_{gw} = average linear velocity (feet/year), K = hydraulic conductivity (feet/year), i = horizontal hydraulic gradient, and n_e = effective porosity.

The average estimated linear groundwater flow velocity under the waste management unit is approximately 110 feet/year (Table 4). The range of groundwater flow is expected to vary depending on the hydrogeologic unit in which it occurs. However, the linear velocity equation above makes the simplified assumptions of a homogeneous and isotropic aquifer. Therefore, this equation represents a likely average value for the uppermost aquifer and does not account for heterogeneous and/or anisotropic conditions that may be present in the uppermost aquifer at the facility. The saprolite may have areas that exhibit relict foliation and these structures can result in locally anisotropic groundwater flow directions.

Nested monitoring wells MW-10S/MW-10D and MW-11S/MW-11D were used to determine the vertical groundwater gradient by dividing the difference in groundwater elevation measured in each well by the difference in vertical elevation of the mid-point of the submerged screened intervals. The vertical gradients were calculated using the following equation:

$$i_v = h_L/L$$

where i_v = vertical hydraulic gradient (foot/foot), h_L = head loss (elevation difference in feet), L = length (vertical distance in feet).

The MW-10S/MW-10D nested well pair is located along the western limits of waste, downgradient of MW-1 and adjacent to an unnamed intermittent stream that flows to the Deep River. Based on the data presented in Table 5 and an evaluation of the elevation of the unnamed stream, there is an upward component of groundwater flow at MW-10S/MW-10D, and the unnamed stream is a receiving stream during at least part of the year.

Well pair MW-11S/MW-11D is located north of the limits of waste, downgradient of MW-7 and MW-2 and adjacent to a wetland along the bank of the Deep River. Based on the data presented in Table 5 and an evaluation of the wetland, there is a downward component of groundwater flow at MW-11S/MW-11D associated with the nearby dam, which is present along the adjacent section of the Deep River.

The vertical groundwater flow rate was calculated using the following formula:

$$V_v = ki_v/\theta$$

where V_v = vertical groundwater flow rate, k = hydraulic conductivity (ft/day), i_v = hydraulic gradient (unitless), θ = assumed porosity (unitless).

The estimated average upward vertical groundwater flow velocity beneath the facility is estimated at approximately 24 feet/year. The estimated average downward groundwater flow velocity is estimated at approximately 9 feet/year (Table 5).

4.0 PLUME CHARACTERIZATION

Analytical results for the NES sampling events are presented below.

4.1 April 2011 Groundwater Monitoring Results

Analytical results for the April 2011 groundwater samples are summarized in Table 6 with available historical data. The laboratory certificates-of-analysis, chain-of-custody form, and laboratory data reviews for the sampling event are included in Appendix F.

As presented, 12 VOCs were detected at concentrations above their respective SWSLs in one or more downgradient compliance wells during the April 2011 sampling event. Acetone; chloroethane; 1,4-dichlorobenzene; 1,2-dichloroethane; cis-1,2-dichloroethene; 2-butanone; toluene; and vinyl chloride were detected at concentrations above their respective SWSLs in the sample from MW-1. Methylene chloride was detected at a concentration above the SWSL in the sample from MW-7. Benzene and 1,1-dichloroethane were detected above their respective SWSLs in samples from MW-1 and MW-7. Trichloroethene was detected above the SWSL in the sample from MW-8. Of these compounds exceeding their respective SWSL, five were reported at concentrations that also exceeded their respective NC 2L Standard. Compounds 1,4-dichlorobenzene; 1,2-dichloroethane; and vinyl chloride were detected at concentrations that exceeded their respective SWSLs and NC 2L Standards in the

sample from MW-1. Benzene and 1,1-dichloroethane were detected at concentrations that exceeded their respective SWSLs and NC 2L Standards in the samples from MW-1 and MW-7. These detected constituents and concentrations are generally similar to historical detections of VOCs in groundwater monitoring wells at the facility.

Also during the April 2011 sampling event, four VOCs were detected above their respective SWSLs in one or more downgradient non-compliance wells. Tetrachloroethene, trichloroethene, and trichlorofluoromethane were detected above their respective SWSLs in the sample from MW-10S. Compound 1,1-dichloroethane was detected above the SWSL in the samples from MW-2, MW-10S, and MW-10D. Of these, tetrachloroethene in the sample from MW-10S and 1,1-dichloroethane in the samples from MW-10S and MW-10D were detected at concentrations that also exceeded their respective NC 2L Standards.

Two VOCs were detected in downgradient wells at estimated concentrations below their respective SWSLs, but above their NC 2L Standards during the April 2011 event. Tetrachloroethene was detected in the sample from MW-2 and vinyl chloride was detected in the samples from MW-7 and MW-10D at estimated concentrations below their respective SWSLs, but above their NC 2L Standards.

Analytical results for the April 2011 surface water samples are summarized in Table 7 with historical data. As presented, none of the NC Appendix I constituents were detected above their surface water standard in the sampled surface points during the April 2011 event.

4.2 April 2011 Headspace Monitoring Results

Analytical results for the April 2011 headspace samples are summarized in Table 8. The laboratory certificates-of-analysis, chain-of-custody form, and laboratory data reviews for the sampling event are included in Appendix G.

Headspace gas samples were collected and analyzed for wells MW-1, MW-7, and MW-8. As presented, nine VOCs were detected at quantifiable concentrations in at least one sample during the April 2011 event. Chloroethane; 1,4-dichlorobenzene; cis-1,2-dichloroethene; and vinyl chloride were detected in the sample from MW-1. Acetone and 2-butanone were detected in the sample from MW-7. Constituent 1,1-dichloroethane was detected in the samples from MW-1, MW-7, and MW-8. Trichloroethene was detected in the samples from MW-1 and MW-8 and trichlorofluoromethane was detected in the samples from MW-7 and MW-8.

Three additional VOCs were detected at estimated concentrations in samples from at least one well. Benzene and 1,1-dichloroethene were detected at estimated concentrations in the sample from MW-1, and carbon disulfide was detected at an estimated concentration in the sample from MW-8.

4.3 Constituents-of-Concern

Based on the review of the VOCs detected during the April 2011 compliance sampling event, the following VOCs are considered to be groundwater constituents-of-concern (COCs) for the Randolph County Landfill due to their detection at concentrations above the NC 2L Standard in samples collected from downgradient monitoring wells. The concentrations listed are the highest concentrations detected during this NES, based on data from the April 2011 event. Note that methylene chloride, which was not detected at concentrations above the NC 2L Standard during the April 2011 event, was later detected at levels in excess of the NC 2L Standard, and is therefore included as a COC for purposes of this NES.

NES Constituents-of-Concern

Organic Constituent-of-Concern	Sample Location(s) where Detected	Highest Concentration [micrograms per liter (ug/L)]
Benzene	MW-1 and MW-7	6.2
1,4-Dichlorobenzene	MW-1 and MW-10D	6.7
1,1-Dichloroethane	MW-1, MW-2, MW-7, MW-8, MW-9, MW-10S, and MW-10D	170
1,2-Dichloroethane	MW-1	3.3
Methylene Chloride	MW-1, MW-2, MW-7, MW-8, MW-10S, and MW-10D	4.4
Tetrachloroethene	MW-2 and MW-10S	2.8
Vinyl Chloride	MW-1, MW-7, and MW-10D	8.8

5.0 NATURE OF RELEASE

The following sections discuss the nature and potential sources of the VOCs detected in groundwater and surface water samples analyzed during this investigation.

5.1 Groundwater Constituents-of-Concern Characterization

As discussed in Section 4.2, the COCs in groundwater at this facility are VOCs. The VOCs are further classified into either aromatic hydrocarbons or chlorinated aliphatic hydrocarbons. Table 9 provides a summary of the physical and chemical properties for the COCs. Generally, the COCs have relatively high vapor pressures, Henry's law constants, and octanol water partitioning coefficients, and relatively low organic carbon partitioning coefficients. Subsequently, these constituents are generally considered to be mobile in the subsurface environment, particularly in groundwater. Further, chlorinated VOCs are considered to be relatively recalcitrant.

5.1.1 Aromatic Hydrocarbons

Aromatic VOCs are readily susceptible to natural attenuation processes in the subsurface and atmospheric environments. Once exposed to the atmosphere, aromatic VOCs are rapidly attenuated by volatilization, ultraviolet (UV) oxidation, photodegradation, and/or biodegradation. Natural biodegradation and other processes that limit the spread of COCs in groundwater are commonly referred to as natural attenuation processes. Aromatic compounds with alkyl sidegroups (toluene, xylenes) are usually easier to degrade than benzene, since the presence of the sidegroup tends to increase biodegradation rates.

Natural attenuation and enhanced *in situ* biodegradation treatment methods can be cost-effective and successful remediation alternatives for aromatic compounds. However, if aromatic VOCs are present in high concentrations or in pure, non-aqueous liquid phase, aromatic VOCs can be toxic to indigenous microorganisms and must be removed for *in situ* biodegradation to be feasible in these areas. When *in situ* methods are not feasible, the removal of the aromatic VOCs (e.g., air stripping) and *ex situ* treatment (e.g., carbon filtration and biological film reactors) become effective options for remediation.

5.1.2 Chlorinated Hydrocarbons

Chlorinated VOCs are relatively soluble and mobile in groundwater, resistant to degradation in aerobic environments, and generally relatively recalcitrant in groundwater as compared to aromatic VOCs. Due to the relatively recalcitrant nature of chlorinated VOCs, higher concentrations of chlorinated VOCs are generally found further downgradient in groundwater than aromatic VOCs when similar source masses are involved. Unlike aromatic VOCs, biodegradation rates for most chlorinated VOCs are relatively higher in anaerobic aquifer conditions, as compared to aerobic aquifer conditions.

Tetrachloroethene and trichloroethene are considered to be the “parent” chlorinated compounds. These compounds will naturally degrade in a predictable sequence in an anaerobic environment with the right geochemical conditions in the presence of the bacterium *dehalococcoides* (*DHC*). In anaerobic environments, the highest concentrations of tetrachloroethene and trichloroethene tend to be near the source, with degradation products (daughter products such as dichloroethene, vinyl chloride, and ethene) located downgradient from the source.

Published literature indicate that the bacterium *DHC* will degrade tetrachloroethene to trichloroethene, dichloroethene, vinyl chloride, and finally to ethene in the absence of trichloroethane. Other bacteria have been shown to degrade one or more of the ethene compounds, but only *DHC* has been demonstrated to fully degrade the series of daughter products to ethene, an unregulated compound. Literature reports indicate that the *DHC* degradation series can be inhibited or interrupted at the dichloroethene-to-vinyl-chloride stage and vinyl-chloride-to-ethene stage. Literature reports that trichloroethane is not readily degraded by *DHC*; however, a sister bacterium *dehalobacter* (*DHB*) has been shown to degrade trichloroethane to dichloroethane, chloroethane, and finally to ethane. Thus, when both chlorinated ethene and ethane compounds are present, the analysis of bacteria cultures may be warranted when considering natural attenuation as a potential remedial measure. Data obtained during this investigation indicate that the entire degradation suite of chlorinated ethene compounds is present, with the exception of ethene, in the groundwater at the site, suggesting the presence of *DHC*.

Anaerobic conditions are often present in the waste mass of landfills. As a result, the degradation of tetrachloroethene and trichloroethene to intermediate products may occur in the waste mass. Degradation of chlorinated VOCs in groundwater can be indicated by sequentially overlapping plumes of parent and degradation products, with the vinyl chloride plume generally located farthest from the point of

the release. When degradation is occurring within the waste mass, clear indication of the degradation sequence can become difficult due to the introduction of the degradation products at the point of release.

In situ techniques for treating chlorinated VOCs include the engineered sequencing and stimulation of anaerobic and aerobic degradation. Additionally, *in situ* treatment methods of oxidation and stripping are available. *Ex situ* treatments involve removal from the subsurface via air stripping and subsequent *ex situ* treatment via carbon filtration.

5.2 Geochemistry Data

An evaluation of the geochemical data obtained during the NES investigation, as it relates to the release and potential for *in situ* biodegradation of COCs, is presented in the following sections.

5.2.1 Geochemical Parameters

Analysis of geochemical parameters (total alkalinity, carbon dioxide, dissolved oxygen, volatile fatty acids, hydrogen, nitrate, chloride, methane, ethane, ethene, total organic carbon, oxygen reduction potential, sulfide, and sulfate) was performed on samples from the compliance and non-compliance monitoring wells. Table 10 presents the geochemical results.

To assess the possibility that chlorinated VOCs are naturally attenuating at the site, geochemical parameters have been evaluated based on criteria presented in the *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water, Table 2.3* (EPA, 1998). Figures 1 through 10 present the scoring criteria in the Protocol, as calculated for monitoring wells MW-1, MW-2, MW-6, MW-7, MW-8, MW-9, MW-10S, MW-10D, MW-11S, and MW-11D based on the VOC concentrations reported during the NES field investigation.

The reported concentration of dissolved oxygen (DO) below 5 milligrams per liter (mg/L) in samples from monitoring wells MW-1, MW-2, MW-6, MW-7, MW-8, MW-9, MW-10S, MW-10D, MW-11S, and MW-11D indicates that a relatively reducing geochemical environment may be present. A reducing geochemical environment is generally supportive of reductive dechlorination (i.e., biodegradation) of chlorinated VOCs.

The concentration of sulfate is below 20 mg/L in samples from all the monitoring wells except MW-10D. Concentrations of sulfate greater than 20 mg/L can inhibit reductive dechlorination. Similarly, nitrate concentrations above 1 mg/L can inhibit reductive dechlorination. Nitrate was reported above 1 mg/L in samples from wells MW-6, MW-7, and MW-8.

Methane can be produced by biological processes under conditions that are strongly associated with reductive dechlorination. Samples from monitoring wells MW-1 and MW-7 contained dissolved methane in concentrations greater than 0.5 mg/L. Concentrations of methane offer evidence of the anaerobic metabolic activity that is supportive of reductive dechlorination of chlorinated VOCs. Dissolved methane can also be associated with landfill gas migrating through the vadose zone (the solubility of methane in

water is 35 mg/L at 17°C). However, methane has not been detected in methane monitoring probes around the MSW landfill above the lower explosive limit for methane (5% by volume).

Chloride is omnipresent and is generally non-reactive, and should, as a result of reductive dechlorination, accumulate in the groundwater. Concentrations of chloride varied from 4.5 mg/L (blank-qualified) in the sample from MW-11D to 270 mg/L in the sample from MW-10D, and the sample from background well MW-5 had a concentration of 8.4 mg/L (blank-qualified). Downgradient samples collected from MW-1 and MW-10D contained the highest chloride concentrations at the site.

In areas of reductive dechlorination of chlorinated VOCs, there is a positive correlation between zones of microbial activity and increased alkalinity. Increases in alkalinity result from the dissolution of minerals in the aquifer matrix, which is driven by the production of carbon dioxide by the metabolism of microorganisms. The alkalinity of groundwater samples was determined by laboratory analysis for total alkalinity during the NES field investigation. As shown in Table 10, total alkalinity was reported in downgradient samples at concentrations ranging from not being detected in the sample from MW-2 to 330 mg/L in samples from MW-1 and MW-10D. The highest concentration of total alkalinity was reported in upgradient well MW-5, at 460 mg/L.

Based on the evaluations presented above (refer to Figures 1 through 10), the geochemical data indicate limited to strong evidence for anaerobic biodegradation of chlorinated VOCs, except at MW-6 and MW-11S, which show inadequate evidence, and suggest that anaerobic biodegradation of the chlorinated VOCs is naturally occurring. A summary of the MNA screening scores is presented in the table below:

Monitoring Well	MNA Screening Score	Interpretation
MW-1	23	Strong
MW-2	11	Limited
MW-6	5	Inadequate
MW-7	14	Limited
MW-8	11	Limited
MW-9	12	Limited
MW-10S	19	Adequate
MW-10D	15	Adequate

MW-11S	4	Inadequate
MW-11D	7	Limited

5.2.2 BIOCHLOR Modeling

Two separate plumes with consistent NC 2L Standard exceedances were identified during the NES investigation. The plumes are located north and west of the limits of waste, as shown on the total VOC isopleth map included as Drawing 2. These two plumes were selected for a performance evaluation of MNA processes. The flow path in the region of monitoring wells MW-7, MW-2, MW-11S, and MW-11D was selected due to the alignment of monitoring wells with groundwater flow in the northernmost portion of the facility. Similarly, the flow path in the region of monitoring wells MW-1, MW-10S, MW-10D, and SW-2 was selected in the western portion of the facility.

Modeling was performed on the April 2011 data to simulate remediation by natural attenuation using the EPA-supplied screening model BIOCHLOR (EPA, 2000). A 30-year simulation period was selected for the model to correlate with the length of time waste has been placed in the landfill. A 100-year simulation was also selected for the model to evaluate if the plume has reached steady-state conditions. BIOCHLOR generates plots that compare concentrations of tetrachloroethene, trichloroethene, dichloroethene, vinyl chloride, and ethene over time with no degradation to concentrations where sequential first order decay is occurring. The plots for the 30-year simulation are provided as Figures 11 through 14.

The first flow path modeled using BIOCHLOR included monitoring wells MW-1, MW-10D, and MW-10S and surface water sampling point SW-2 (Figures 11 and 12). The plots of tetrachloroethene, trichloroethene, dichloroethene, and vinyl chloride concentrations versus distance show the plume concentrations including biological attenuation as compared to no biological attenuation (Figure 12). As shown on Figure 12, the model was calibrated so that the detections of tetrachloroethene and trichloroethene from the sample from monitoring well MW-10S plot reasonably well on the sequential first order decay curve. The model was also calibrated to dichloroethene and vinyl chloride concentrations, though the detections of dichloroethene in the samples from wells MW-1, MW-10S, and MW-10D and the detections of vinyl chloride in the samples from MW-1 and MW-10D plot slightly below the curve. Figure 12 shows that concentrations of tetrachloroethene, trichloroethene, dichloroethene, and vinyl chloride decline to nearly non-detectable concentrations well before the end of the graph, which represents the beginning of a wetland that drains into the Deep River at the property boundary. There is little to no difference between the curves on the 30-year and 100-year simulations, indicating the contaminant plume is currently at a steady-state condition and is no longer moving further downgradient.

The second set of wells to be modeled using BIOCHLOR included MW-7, MW-2, MW-11S, and MW-11D (Figures 13 and 14). The plots of tetrachloroethene, trichloroethene, dichloroethene, and vinyl chloride concentrations versus distance show the plume concentrations including biological attenuation as compared to no biological attenuation (Figure 14). Because the concentrations of the four constituents were so low in these wells, the model used the same calibration parameters used on the previous model. As shown on Figure 14, the detection of tetrachloroethene in the sample from monitoring well MW-2 and the detections of dichloroethene and vinyl chloride in the sample from MW-7 plot slightly below the sequential first order decay curve. Figure 14 shows that the concentration of trichloroethene from the sample from MW-2 plots on the sequential first order decay curve. Figure 14 indicates that concentrations of tetrachloroethene, trichloroethene, dichloroethene, and vinyl chloride approach non-detectable concentrations before the end of the graph, which represents the location of the Deep River at the property boundary. There is little to no difference between the curves on the 30-year and 100-year simulations, indicating the contaminant plume is currently at a steady state condition and is no longer moving further downgradient.

5.3 Landfill Gas Source Evaluation

During the April 2011 monitoring event, headspace/gas samples were collected from monitoring wells MW-1, MW-7, and MW-8 for selected laboratory analyses to determine if landfill gas could be a source of VOCs in groundwater samples. The laboratory certificates-of-analysis and chain-of-custody forms for the headspace samples analyzed during this investigation are presented in Appendix G and the analytical results are summarized in Table 8.

To evaluate landfill gas as a potential source of VOC concentrations in groundwater samples, Golder evaluated the potential for the VOCs in landfill gas to partition to groundwater using a numerical soil-gas to groundwater partitioning model. Golder also compared methane detections from groundwater samples to methane measurements from the headspace of monitoring wells. Although more qualitative, Golder also evaluated the potential for landfill gas to accumulate in the well casing, allowing for direct exposure of groundwater within the well casing to landfill gas in the headspace. It is noted that impacted headspace is not necessarily required for landfill gas to impact groundwater (i.e., such impacts can happen outside of the well casings). Further, due to the transient nature of landfill gas, concentrations vary greatly temporally and spatially.

Since site-specific data on VOC concentrations in landfill gas are available, VOC concentrations observed in the groundwater near the affected monitoring wells were evaluated to determine what concentrations would theoretically be required in the landfill gas to develop the concentrations observed in the groundwater. These estimated values were then compared to the observed concentrations detected in headspace samples. The evaluations were performed using the dimensionless form of the Henry's Law Constant (H) for the VOCs (Table 11), since the dimensionless form of H is the gas-water partitioning coefficient. The following is an example calculation:

Analytical Solution: H = Concentration in gas ÷ Concentration in water
or:
Concentration in gas = H * Concentration in water

Where: H (dimensionless)
Concentration in gas [parts per billion (ppb)]
Concentration in water [micrograms per liter (ug/L)]

Observed maximum VOC concentration in groundwater:

Acetone = 140 ug/L

Estimated gas concentration necessary to obtain observed groundwater concentrations:

COC_{gas} = H x $COC_{dissolved}$ ug/L

$Acetone_{gas}$ = 0.00159 x 140 ug/L

$Acetone_{gas}$ = 0.223 ug/L

To express in ppb, divide by mole conversion factor:

$Acetone_{gas}$ = 0.223 ug/L ÷ 2.37E-03

$Acetone_{gas}$ = 94.1 ppb

Table 11 presents the above calculations for each VOC detected in the groundwater samples.

As presented on Table 11, the numerical simulation suggests that the vadose zone gas concentrations required to develop the observed groundwater concentrations are in most cases much greater than the concentrations observed in the headspace samples that were collected as part of this investigation. This finding is likely due to a number of factors. The low VOC concentrations detected in the headspace sample collected from MW-8 are likely attributable to the fact that the water level in this area of the aquifer is above the top of the screened interval in this well; therefore, gas in the vadose zone surrounding the well does not have the opportunity to migrate into the well casing.

With regard to MW-1, MW-7, and MW-8, the theoretical concentrations calculated assume that steady-state equilibrium conditions exist; that is, that the groundwater and soil gas temperatures are steady, the pressure in the vadose zone is steady, the groundwater volume and surface area is fixed, and that there is no flux in the VOC concentrations in the soil gas or groundwater that can be attributed to outside influences (e.g., barometric pressure fluctuations or groundwater flow velocity). These results do not support a potential landfill gas impact scenario.

Relatively high concentrations of gas phase VOCs were detected in the headspace sample collected from monitoring well MW-1. A similar analysis to the above-presented analysis was conducted to evaluate the dissolved phase concentrations of VOCs that may be partitioned into the groundwater by gaseous phase VOCs.

Analytical Solution: H = Concentration in gas ÷ Concentration in water
or:
Concentration in water = Concentration in gas / H

The results of this analysis are presented in Table 12 and are based on the calculation above. The results show that the gaseous phase VOCs detected in headspace samples collected from monitoring wells MW-1, MW-7, and MW-8 are not significant enough to partition dissolved phase VOCs into the groundwater at concentrations similar to those observed in groundwater samples (Table 12). However, it is possible that landfill gas to groundwater partitioning is occurring at locations closer to the waste unit and upgradient of the affected monitoring wells. The limited samples of landfill gas collected during this investigation have been demonstrated to contain several of the VOCs that have been detected in the groundwater. Therefore, landfill gas may represent a potential source of VOCs in groundwater, in addition to leachate.

6.0 EXTENT OF OBSERVED CONTAMINATION

The following section describes the horizontal and vertical extent of contamination at the facility.

6.1 Lateral Extent of Observed Groundwater Contamination

Using the laboratory and field analytical data collected during the NES investigation, a series of isopleth maps for the COCs was prepared. The VOCs detected at concentrations that exceed the NC 2L Standards during the April 2011 event (benzene; 1,4-dichlorobenzene; 1,1-dichloroethane; 1,2-dichloroethane; tetrachloroethene; and vinyl chloride) were individually contoured on site maps (Drawings 3 through 6 and 8 through 9). An isopleth map for methylene chloride was included as Drawing 7 because it has been detected above the NC 2L Standard since field activities for the NES investigation were conducted. Additionally, the sum of the VOC concentrations (including all aromatic and chlorinated VOCs) detected at each groundwater sampling location is presented on Table 13 and on an isopleth map on Drawing 2. As presented, each VOC varies in concentration and extent, with the NC 2L Standard exceedances occurring downgradient of the limits of waste.

As shown on Drawing 2, four separate dissolved-phase groundwater plumes extend beyond the limits of waste, as interpreted from VOC detections in groundwater samples from monitoring wells. Samples from compliance monitoring wells downgradient of the eastern limits of waste (MW-8 and MW-9) did not have detections of VOCs above the SWSLs and NC 2L Standards during the April 2011 event; however, samples from MW-8 have shown an increasing trend in COC concentrations approaching their NC 2L Standards, and recent samples (October 2009, October 2010, October 2011, and October 2012) from MW-9 have had detections of one COC (vinyl chloride) above the NC 2L Standard. The plumes shown along the western and northern limits of waste contain monitoring wells with groundwater samples that did have detections of VOCs that exceeded NC 2L Standards during the April 2011 event. The estimated lateral extent of each dissolved-phase groundwater plume is shown on Drawing 2, which shows that the

plumes are well within the property boundary. The plumes appear to originate from the waste mass, the interpreted source of the COCs, and extend downgradient. Each of the four identified dissolved-phase groundwater plumes is described below.

The first location is in the southeastern corner of the waste unit where well MW-9 is located. During the April 2011 event, two VOCs (1,1-dichloroethane and cis-1,2-dichloroethene) were detected in the sample from MW-9 at estimated concentrations below their SWSLs and NC 2L Standards. Vinyl chloride has been detected in samples from MW-9 at estimated concentrations below the SWSL, but above the NC 2L Standard during four of the last 10 events (Table 6). Given the inconsistent detections of vinyl chloride at low concentrations and that vinyl chloride typically identifies the furthest extent of a VOC plume, the plume does not appear to extend appreciably downgradient of MW-9, and does not extend beyond the property boundary, which is approximately 950 feet to the northeast, as seen on Drawing 10. Surface water point SW-1 is located approximately 700 feet downstream of this plume, and no VOCs have been detected in samples collected from this surface water location.

The second location is east of the eastern limits of waste where MW-8 is located. During the April 2011 event, trichloroethene was detected in the sample from MW-8 above the SWSL, but below the NC 2L Standard, and three VOCs (1,1-dichloroethane; cis-1,2-dichloroethene; and methylene chloride) were detected at estimated concentrations below their respective SWSLs and NC 2L Standards. Since the April 2011 event, concentrations of 1,1-dichloroethene have increased during subsequent sampling events with concentrations just below the NC 2L Standard. The VOC plume is estimated to extend approximately 90 feet east-northeast of MW-8 toward non-compliance well MW-3, and does not extend beyond the property boundary, which is approximately 200 feet to the east. Well MW-3 was not sampled during the NES because no NC 2L Standard exceedances have been documented in samples from MW-8 during recent sampling events. An unnamed tributary of the Deep River is located approximately 225 feet east of MW-8 and likely represents a groundwater divide between the VOC plume and the property line.

The third location is north of the limits of waste where MW-7 is located. Non-compliance wells MW-2, MW-11S, and MW-11D are also located in the area. Benzene was detected in the sample from MW-7 at a concentration that exceeded the SWSL and NC 2L Standard during the April 2011 event. Vinyl chloride was detected in the sample from MW-7 at an estimated concentration below the SWSL, but above the NC 2L Standard. Two additional VOCs (1,1-dichloroethane and methylene chloride) were detected in the sample from MW-7 above their respective SWSLs, but below their NC 2L Standards. Three VOCs (chlorobenzene; dichlorofluoromethane; and cis-1,2-dichloroethene) were detected in the sample from MW-7 at estimated concentrations below their respective SWSLs and NC 2L Standards.

Further downgradient from MW-7, the sample from non-compliance well MW-2 had one VOC (1,1-dichloroethane) detected at a concentration that exceeded the SWSL and NC 2L Standard.

Tetrachloroethene was detected in the sample from MW-2 at an estimated concentration below the SWSL, but exceeded the NC 2L Standard. Three additional VOCs (chloroethane; 1,1-dichloroethene; and methylene chloride) were detected in the sample from MW-2 at estimated concentrations below their respective SWSLs and NC 2L Standards. No VOCs were detected in the samples from the MW-11 nested well pair. The northern VOC plume is estimated to terminate before reaching the MW-11 nested pair, and does not appear to extend beyond the property boundary, which is approximately 340 feet to the north-northwest of the MW-11 well pair.

The fourth location is west of the western limits of waste where MW-1 is located. Non-compliance wells MW-10S and MW-10D are also located in the area. Five VOCs (benzene; 1,4-dichlorobenzene; 1,1-dichloroethane; 1,2-dichloroethane; and vinyl chloride) were detected in the sample from MW-1 at concentrations that exceeded their respective SWSLs and NC 2L Standards during the April 2011 event. Five VOCs (acetone; chloroethane; cis-1,2-dichloroethene; 2-butanone; and toluene) were detected in the sample from MW-1 at concentrations above their respective SWSLs, but below their NC 2L Standards. Three additional VOCs (methylene chloride; 4-methyl-2-pentanone; and total xylenes) were detected in the sample from MW-1 at estimated concentrations below their respective SWSLs and NC 2L Standards.

The constituent 1,1-dichloroethane was detected in the sample from MW-10D at a concentration that exceeded the SWSL and NC 2L Standard during the April 2011 event. Tetrachloroethene was detected in the sample from MW-10D at an estimated concentration below the SWSL, but above the NC 2L Standard. Four additional VOCs (chloroethane; 1,4-dichlorobenzene; cis-1,2-dichloroethene; and methylene chloride) were detected in MW-10D at estimated concentrations below their respective SWSLs and NC 2L Standards.

Two VOCs (1,1-dichloroethane and tetrachloroethene) were detected in the sample from MW-10S at concentrations that exceeded their respective SWSLs and NC 2L Standards during the April 2011 event. Two VOCs (trichloroethene and trichlorofluoromethane) were detected in the sample from MW-10S at concentrations above their respective SWSLs, but below their NC 2Ls. Four VOCs (chloroethane; dichlorodifluoromethane; cis-1,2-dichloroethene; and methylene chloride) were detected in the sample from MW-10S at estimated concentrations below their respective SWSLs and NC 2L Standards.

This groundwater plume appears to extend approximately 100 feet west to an unnamed stream that flows north to the Deep River. Based on the receiving nature of the stream, which was discussed in Section 3.2 and is interpreted to represent a hydraulic divide for shallow groundwater flow, and based on the observed hydraulic gradient and VOC concentration gradients observed in the nested monitoring wells (MW-10S and MW-10D), the maximum extent of the COCs to the west is interpreted to be this surface water feature. Surface water sampling data from surface water monitoring point SW-2, which is located approximately 730 feet north of MW-1 along the unnamed stream, indicates that potential discharge of COCs to the surface water feature has not resulted in surface water quality impacts; though the plume

has been conservatively estimated to extend to SW-2 because of estimated concentrations of VOCs detected in the surface water point during the April 2011 event. The plume is not expected to extend to the northern property line, which is adjacent to the unnamed stream that flows into the Deep River.

As presented above, there is no off-site plume migration. Drawing 10 shows there are no residences in close proximity of the landfill.

6.2 Vertical Extent of Observed Groundwater Contamination

Four cross-sections were constructed through and downgradient of the MSW landfill, as presented on Drawing 11. Cross-section A-A' runs east-southeast from the southeastern corner of the waste unit to MW-9 and through an unnamed intermittent stream. Based on topography, it is expected that there is a downward component of groundwater flow near the waste unit. An upward vertical flow gradient is expected at the stream, at least during part of the year, as groundwater forms the base flow of the stream, which represents a groundwater divide for shallow groundwater flow.

Cross-section B-B' runs approximately northeast through the eastern section of the MSW landfill and wells MW-8 and MW-3. The cross-section shows that, like cross-section A-A', it is expected that there is a downward component of groundwater flow near the waste unit, which is expected to extend to the area around MW-8. Further downslope, it is expected that there is an upward vertical flow gradient closer to the Deep River.

Cross-section C-C' runs approximately north-northeast through the northern section of the MSW landfill and wells MW-7, MW-2, MW-11S, and MW-11D. The cross-section shows that total VOC concentrations are higher in the sample from MW-11D, which is screened in bedrock, than MW-11S, which is screened in the shallower saprolite unit. This finding is consistent with the results on Table 5, which shows a downward vertical flow gradient at the well pair. The downward vertical gradient near the Deep River in this area is due to the river being dammed downstream of the landfill, which has artificially elevated the shallow groundwater in the area.

Cross-section D-D' runs approximately north-northeast through the northern section of the MSW landfill and wells MW-1, MW-10S, and MW-10D, then across an unnamed stream. The cross-section shows that total VOC concentrations are higher in MW-10S, which is screened in saprolite, than MW-10D, which is screened in the deeper bedrock unit. This finding is consistent with Table 5, which shows an upward vertical flow gradient at the well pair. MW-10S and MW-10D are located next to an unnamed stream adjacent to the western edge of waste, which is interpreted to represent a receiving stream and a groundwater divide for shallow groundwater flow.

7.0 CONSTITUENT-OF-CONCERN CONCENTRATION TRENDS

Three additional semi-annual compliance monitoring events have occurred since the NES field investigation took place. The number of NC 2L Standard exceedances that have occurred in samples from compliance monitoring wells since the April 2011 NES investigation has been relatively stable. During the April 2011 event, five VOCs (benzene; 1,4-dichlorobenzene; 1,1-dichloroethane; 1,2-dichloroethane; and vinyl chloride) were reported at concentrations that exceeded their respective SWSLs and NC 2L Standards in samples collected from one or more compliance monitoring wells. All five VOCs had been historically detected in samples collected from compliance monitoring wells. During the October 2011 event, four VOCs (benzene; 1,1-dichloroethane; methylene chloride; and vinyl chloride) were reported at concentrations that exceeded their respective SWSLs and NC 2L Standards in samples collected from one or more compliance monitoring wells. During the April 2012 event, four VOCs (benzene; 1,4-dichlorobenzene; 1,1-dichloroethane; and vinyl chloride) were reported at concentrations that exceeded their respective SWSLs and NC 2L Standards in samples collected from one or more compliance monitoring wells. During the October 2012 event, six VOCs (benzene; 1,4-dichlorobenzene; 1,1-dichloroethane; 1,2-dichloroethane; methylene chloride; and vinyl chloride) were reported at concentrations that were equal to or exceeded their respective NC 2L Standard in samples collected from one or more compliance monitoring wells.

The trend graphs presented as Figures 15 through 19 visually show the concentration trends for the COCs detected in samples from each downgradient compliance well. Figure 15 shows the concentrations over time of the COCs detected in samples from MW-1. The figure shows that benzene concentrations have had a declining trend for the last four sampling events, but remain well above the NC 2L Standard. Concentrations of 1,4-dichlorobenzene have had a declining trend for the last five sampling events, and the current concentration is just above the NC 2L Standard. The concentrations of 1,1-dichloroethane have been declining over the last 13 events, and the current concentration is just above the NC 2L Standard. Vinyl chloride concentrations have a declining trend for the last 10 sampling events and have been below the NC 2L Standard two of the last three events. Concentrations of 1,2-dichloroethane have been rather stable over the last 12 events, with concentrations exceeding the NC 2L Standard for all but three of those events. Methylene chloride concentrations had been below the NC 2L Standard for eight consecutive events with five of those events being “non-detect,” but methylene chloride was detected above the NC 2L Standard during the last event. Tetrachloroethene has not been detected during the last 10 events.

One COC has historically been detected in samples from MW-6. The trend graph for 1,1-dichloroethane in samples from MW-6 is provided on Figure 16. The graph shows that 1,1-dichloroethane was detected during two consecutive events during in April and October 2010.

Figure 17 shows the concentrations over time of the COCs detected in samples from MW-7. The graphs show that benzene and vinyl chloride have been detected at relatively consistent concentrations above

their respective NC 2L Standards for the last several events. The constituent 1,4-dichlorobenzene has been detected in samples from MW-7 during two sampling events, and has not exceeded the NC 2L Standard. Figure 17 shows that methylene chloride was detected at a relatively high concentration in April 2001, and declined to concentrations below the NC 2L Standard by the April 2006 event. Recent concentrations have been relatively consistent, with concentrations both above and below the NC 2L Standard.

The trend graphs on Figure 18 show that no COCs have been detected at concentrations that exceeded their NC 2L Standards in samples from MW-8. The graphs also show that 1,1-dichloroethane; tetrachloroethene; and methylene chloride have recently shown increasing concentration trends, with 1,1-dichloroethane and tetrachloroethene approaching their NC 2L Standards.

Figure 19 shows the concentrations over time of the COCs detected in samples from MW-9. Figure 19 shows that one COC (vinyl chloride) has been detected in samples from MW-9 at estimated concentrations above the NC 2L Standard four times since April 2008. Tetrachloroethene has been historically detected twice at concentrations below the NC 2L Standard. Concentrations of 1,1-dichloroethane have been relatively consistent since its first detection during the October 2007 event, and have remained below the NC 2L Standard.

In summary, concentrations of COCs from samples from MW-1 generally show decreasing trends, and samples from MW-7 indicate relatively stable concentrations near or above the respective NC 2L Standards of COCs benzene, methylene chloride, and vinyl chloride. Samples from MW-8 show increasing concentration trends of COCs 1,1-dichloroethane; methylene chloride; and tetrachloroethene, with methylene chloride and tetrachloroethene concentrations nearing their respective NC 2L Standards. Vinyl chloride has inconsistently been detected in samples from MW-9 at levels that have exceeded the NC 2L Standard. The trend graphs for MW-1 and MW-7 correspond with the BIOCHLOR modeling presented earlier, which calculated that the contaminant plume is at a steady-state condition and the parent compounds are expected to remain stable or decrease in concentration over time. Also, natural attenuation processes within the contaminated area at MW-1 appear strong based on the available data, an observation that corresponds with the natural attenuation screening matrix provided as Figure 1. Natural attenuation processes within the contaminated area at MW-7 appear adequate, but less strong than at MW-1, based on the available data, corresponding with the natural attenuation screening matrix provided as Figure 4.

8.0 CONCLUSIONS

In summary, the available data indicate that the Randolph County Landfill has experienced a release of solid waste constituents, consisting of VOCs, which have impacted the groundwater in the uppermost aquifer beneath the site. The spatial distribution of the impacted groundwater shows the likelihood of four discrete plumes. The MW-9 plume, located beneath and sidegradient from the landfill along the

southeast corner of the waste unit, is comprised predominately of chlorinated VOCs. The impacted groundwater appears to extend vertically to the top of bedrock and may extend into shallow bedrock. Based on expected upward vertical hydraulic gradients near the unnamed stream east of the waste unit and the mapped and observed nature of the stream, the stream is interpreted to be a hydraulic divide for shallow groundwater flow. The plume is not expected to extend much beyond MW-9. Results from samples from surface water monitoring point SW-1, which is downgradient of this plume, indicate no detected COCs.

The MW-8 plume, located beneath and downgradient from the landfill east of the eastern limits of waste, is comprised predominately of chlorinated VOCs. The impacted groundwater appears to extend vertically to the top of bedrock and may extend into shallow bedrock. The plume is not interpreted to extend as far as MW-3, which is approximately 135 feet downgradient of MW-8. The vertical hydraulic gradient at the facility boundary is expected to be upward near the unnamed stream east of MW-3, limiting the migration potential of the COCs.

The MW-7 plume, located beneath and downgradient of the landfill north of the northernmost extent of the waste unit, is comprised predominately of chlorinated VOCs with some aromatic VOCs. The impacted groundwater appears to extend vertically into bedrock. The downward vertical hydraulic gradient near the Deep River in this area is due to the river being dammed, which may cause a reversal in the local hydraulic gradient toward landfill. Therefore, the maximum extent of the plume is not expected to reach the property boundary.

The MW-1 plume, located beneath and downgradient from the landfill north-northwest of the western extent of the waste unit, is comprised of chlorinated and aromatic VOCs. The impacted groundwater appears to extend vertically into bedrock. Based on upward vertical hydraulic gradients near the unnamed stream west of the waste unit and the mapped and observed perennial nature of the stream, the stream is interpreted to be a hydraulic divide for shallow groundwater flow and represents the maximum western extent of the plume.

Evidence collected during the NES investigation indicates that a reducing environment is present at the MW-1 plume, providing the potential for anaerobic dechlorination of the organic COCs. There is limited evidence that a reducing environment is present at the MW-7 plume. The MW-8 plume was not evaluated because there are currently no NC 2L Standard exceedances. The MW-9 plume was not evaluated because of its history of inconsistent NC 2L exceedances of vinyl chloride at estimated concentrations. Modeling results using groundwater data from the MW-1 and MW-7 plumes indicate the contaminant plumes are at a steady-state condition and are no longer migrating further downgradient. Although the unlined landfill and associated landfill gas constitute a continuing source of solid waste constituents, the contaminant plumes are stable, and migration is limited by a combination of natural

attenuation processes and physical hydrogeologic barriers. No off-site plume migration is expected and there are no residences in close proximity of the landfill.

9.0 RECOMMENDATIONS

Based on the findings of this investigation, after approval of the *Nature and Extent Study* by NC DENR and in accordance with Title 15A NCAC Subchapter 13B.1635, an *Assessment of Corrective Measures* (ACM) should be prepared and submitted to NC DENR. The purpose of the ACM will be to evaluate the feasibility and effectiveness of implementing a variety of remediation methods at the site, based on the site and plume characteristics described herein, to assist in the selection of a remedial strategy.

10.0 REFERENCES

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TABLES

TABLE 1

Summary of Well Construction Information

Nature and Extent Study

Randolph County Landfill, Permit No. 76-01

Well Identification	Ground Surface Elevation (ft AMSL)	TOC Elevation (ft AMSL)	Well Depth (feet)	Well Diameter (inches)	Screened Interval (ft AMSL)	Status
MW-1	609.21	610.97	28.0	2	585.21 - 600.21	Compliance Well
MW-2	580.97	582.75	33.0	2	547.97 - 567.97	Water Levels Only
MW-3	585.17	587.33	30.0	2	555.17 - 575.17	Water Levels Only
MW-4	716.53	719.10	47.5	2	669.03 - 699.03	Water Levels Only
MW-5	720.55	722.67	68.5	2	652.05 - 667.05	Compliance Well
MW-6	622.96	624.96	17.8	2	605.46 - 615.46	Compliance Well
MW-7	585.14	586.97	26.0	2	560.14 - 575.14	Compliance Well
MW-8	592.68	594.73	29.0	2	564.68 - 579.68	Compliance Well
MW-9	615.93	617.79	33.0	2	582.93 - 597.93	Compliance Well
MW-10S	594.48	596.92	25.0	2	569.48 - 584.48	Assessment Well
MW-10D	594.56	596.80	73.0	2	521.56 - 531.56	Assessment Well
MW-11S	574.88	577.73	25.0	2	549.88 - 559.88	Assessment Well
MW-11D	574.64	577.57	65.0	2	509.64 - 519.64	Assessment Well
MW-A1	623.50	624.62	15.0	2	611.00 - 622.00	Water Levels Only
MW-A2	639.41	641.54	17.5	2	623.41 - 639.41	Water Levels Only
MW-A3	693.14	694.76	32.0	2	663.14 - 683.14	Water Levels Only

Notes: ft AMSL = feet above mean sea level
TOC = Top of Well Casing Elevation
Groundwater Monitoring Network Information:
MW-5 is the facility's background well.
MW-2 was replaced by MW-7.
MW-3 was replaced by MW-8.
MW-4 was replaced by MW-5.
MW-A1 was replaced by MW-6.

TABLE 2

Summary of Hydraulic Conductivity Values
Nature and Extent Study
Randolph County Landfill, Permit No. 76-01

Monitoring Well Identification	Saturated Aquifer Thickness Value (feet)	Screen Length (feet)	Piezometer Diameter (inches)	Aquifer Analysis Method	Aquifer Test Type	Hydraulic Conductivity K (cm/sec)	Screened Lithology
MW-10S	18.54	15	2	Bouwer-Rice	Falling	1.22E-04	Saprolite
MW-10D	100.00	10	2	Bouwer-Rice	Falling	1.43E-04	Bedrock
MW-10D	100.00	10	2	Bouwer-Rice	Rising	2.11E-04	Bedrock
MW-11S	18.66	10	2	Bouwer-Rice	Falling	2.38E-04	Saprolite/PWR
MW-11S	18.93	10	2	Bouwer-Rice	Rising	4.02E-04	Saprolite/PWR
MW-11D	100.00	10	2	Bouwer-Rice	Falling	1.55E-04	Bedrock
MW-11D	100.00	10	2	Bouwer-Rice	Rising	7.20E-04	Bedrock
					Geomean =	**2.35E-04**	

Notes: Geomean = geometric mean
cm/sec = centimeter per second
PWR = partially weathered rock

TABLE 3

Summary of Historical Static Water Level Data
Nature and Extent Study
Randolph County Landfill, Permit No. 76-01

	Monitoring Well															
	MW-1	**MW-2**	**MW-3**	**MW-4**	**MW-5**	**MW-6**	**MW-7**	**MW-8**	**MW-9**	**MW-10S**	**MW-10D**	**MW-11S**	**MW-11D**	**MW-A1**	**MW-A2**	**MW-A3**
TOC Elevation (ft AMSL)	610.97	582.75	587.33	719.10	722.67	624.96	586.97	594.73	617.79	596.92	596.80	577.73	577.57	624.62	641.54	694.76
Date	**Static Water Elevation (ft AMSL)**															
09/22/94	591.76	--	--	--	661.80	612.91	565.70	581.09	594.34	--	--	--	--	--	--	682.81
11/08/94	590.22	--	--	--	661.43	612.90	565.22	578.50	593.86	--	--	--	--	--	--	--
01/18/95	593.92	--	--	--	661.35	616.08	566.23	584.11	594.81	--	--	--	--	--	--	--
04/23/96	594.57	--	--	--	670.56	613.87	566.26	581.78	597.74	--	--	--	--	--	--	687.39
06/17/97	595.06	--	--	--	672.12	613.31	565.81	578.72	597.05	--	--	--	--	--	--	684.60
10/16/97	593.86	--	--	--	668.10	613.51	565.30	575.39	594.95	--	--	--	--	--	--	682.11
04/21/98	598.00	--	--	--	673.00	616.06	567.35	585.57	600.16	--	--	--	--	--	--	689.28
04/07/99	596.02	--	--	--	666.42	614.44	566.25	583.73	597.34	--	--	--	--	--	--	683.74
10/13/99	595.35	--	--	--	662.22	614.96	566.25	581.80	595.81	--	--	--	--	--	--	680.58
04/05/00	596.03	--	--	--	665.47	613.78	566.06	584.46	599.79	--	--	--	--	--	--	683.61
10/25/00	593.83	--	--	--	661.24	613.49	564.69	576.28	594.79	--	--	--	--	--	--	679.36
04/04/01	595.97	--	--	--	661.07	614.96	566.72	584.95	599.17	--	--	--	--	--	--	682.76
04/08/02	594.79	578.22	--	--	658.42	613.76	566.28	583.61	598.03	--	--	--	--	--	--	682.15
10/21/02	594.46	578.15	--	--	653.82	614.01	562.89	581.41	593.48	--	--	--	--	--	--	677.45
04/14/03	598.32	578.40	--	--	667.12	615.19	569.30	585.08	602.49	--	--	--	--	--	--	687.30
10/01/03	596.68	577.11	--	--	668.92	613.71	566.75	581.94	601.02	--	--	--	--	--	--	684.27
04/05/04	594.96	577.64	--	--	666.98	614.79	566.60	583.53	600.97	--	--	--	--	--	--	684.28
10/18/04	595.69	576.77	--	--	663.77	613.75	566.14	581.83	599.61	--	--	--	--	--	--	680.90
04/07/05	596.22	578.10	--	--	669.97	613.40	567.55	584.00	603.09	--	--	--	--	--	--	684.65
10/06/05	592.87	577.17	--	--	663.53	611.94	561.82	573.06	597.38	--	--	--	--	--	--	679.08
04/03/06	593.08	577.76	--	--	664.57	613.80	566.50	582.05	601.36	--	--	--	--	--	--	681.20
10/03/06	591.87	577.38	--	--	659.26	612.41	563.20	574.54	597.46	--	--	--	--	--	--	676.95
04/05/07	594.80	577.75	--	--	664.74	613.92	566.67	581.85	601.69	--	--	--	--	--	--	682.26
10/18/07	590.04	576.83	--	--	655.87	609.32	--	570.74	592.68	--	--	--	--	--	--	676.35
04/28-29/08	594.57	570.88	569.08	700.65	658.64	617.55	568.07	583.01	600.33	--	--	--	--	618.11	637.72	685.12
10/22/08	593.19	566.14	563.74	696.10	657.41	613.86	566.39	578.41	595.84	--	--	--	--	615.08	636.36	680.32
04/07/09	596.59	568.14	--	701.37	664.68	614.10	569.01	583.53	601.99	--	--	--	--	617.02	636.45	684.54
10/19/09	592.67	565.33	563.31	696.14	660.17	613.83	565.27	575.27	594.36	--	--	--	--	614.51	636.34	679.85
4/28-29/10	595.59	566.66	564.91	707.73	669.52	613.85	567.26	579.09	600.17	--	--	--	--	615.81	636.10	683.19
10/12/10	593.71	565.05	562.93	697.28	662.77	613.80	565.10	574.93	594.32	--	--	--	--	614.52	636.53	680.21
4/11-13/11	595.36	567.60	568.46	710.55	661.22	614.41	568.59	583.92	599.98	584.93	587.69	567.89	566.73	616.26	636.48	683.37
10/03-04/11	592.24	565.17	564.08	694.61	657.79	613.79	565.29	576.33	593.64	--	--	--	--	614.20	636.50	678.09
04/10/12	595.71	567.70	565.96	709.47	663.99	613.94	568.58	581.75	600.90	584.52	588.29	567.45	566.40	615.95	636.22	682.96
10/15/12	591.76	565.06	563.40	697.26	657.18	613.93	565.73	575.45	593.91	--	--	--	--	614.36	636.40	679.06
MEAN	*594.48*	*572.68*	*565.10*	*701.12*	*663.39*	*613.92*	*566.21*	*580.34*	*597.78*	*584.73*	*587.99*	*567.67*	*566.57*	*615.58*	*636.51*	*682.18*
MAXIMUM	*598.32*	*578.40*	*569.08*	*710.55*	*673.00*	*617.55*	*569.30*	*585.57*	*603.09*	*584.93*	*588.29*	*567.89*	*566.73*	*618.11*	*637.72*	*689.28*
MINIMUM	*590.04*	*565.05*	*562.93*	*694.61*	*653.82*	*609.32*	*561.82*	*570.74*	*592.68*	*584.52*	*587.69*	*567.45*	*566.40*	*614.20*	*636.10*	*676.35*

Notes: ft AMSL = feet above mean sea level.
TOC = top of casing
-- = no data available
1) Wells MW-2, MW-3, MW-4, MW10S, MW10D, MW11S, MW11D, MW-A1, MW-A2, and MW-A3 are not sampled as part of the compliance network.
2) Historical data prior to April 2008 provided by Randolph County and taken from historical reports from Hazen and Sawyer and Environment 1.

TABLE 4

Summary of Estimated Horizontal Flow Gradient and Velocities
Nature and Extent Study
Randolph County Landfill, Permit No. 76-01

April 2011							
Gradient Calculation Segment	**Flow Direction**	**Gradient Segment Length (feet)**	**Gradient Segment Elevations (feet)**	**Horizontal Gradient (i, feet)**	**Effective Porosity (n_e)**	**Hydraulic Conductivity (K, cm/sec)**	**Velocity (V_{gw}, feet/year)**
i_1	NNE	1314	640 / 580	0.0457	0.15	2.75E-04	86.62
i_2	NE	1414	640 / 570	0.0495	0.15	2.75E-04	93.94
i_3	ENE	755	640 / 580	0.0794	0.15	2.75E-04	150.67

Notes: Horizontal velocities based on the modified Darcy equation $V_{gw} = Ki/n_e$.
Value for K is from Wang and others, 2008.
Value for n_e is from the Hazen and Sawyer's December 4, 1997 Letter Report to NCDENR on *Groundwater Monitoring Data.*

TABLE 5

Summary of Estimated Vertical Flow Gradients and Velocities
Nature and Extent Study
Randolph County Landfill, Permit No. 76-01

April 2011								
Well pair	**Screened Interval (feet)**	**Flow Direction**	**Gradient Segment Length (feet)**	**Gradient Segment Elevations (feet)**	**Vertical Gradient (i_v, feet)**	**Effective Porosity (n_e)**	**Hydraulic Conductivity (K_z, cm/sec)**	**Velocity (V_v, feet/year)**
MW-10D	63-73	Upward	56.13	587.69	-0.0492	0.15	5.88E-05	-19.91
MW-10S	10-25			584.93				
MW-11D	55-65	Downward	50.32	566.73	0.0231	0.15	5.88E-05	9.34
MW-11S	15-25			567.89				

April 2012								
Well pair	**Screened Interval (feet)**	**Flow Direction**	**Gradient Segment Length (feet)**	**Gradient Segment Elevations (feet)**	**Vertical Gradient (i_v, feet)**	**Effective Porosity (n_e)**	**Hydraulic Conductivity (K_z, cm/sec)**	**Velocity (V_v, feet/year)**
MW-10D	63-73	Upward	55.72	588.29	-0.0677	0.15	5.88E-05	-27.40
MW-10S	10-25			584.52				
MW-11D	55-65	Downward	49.88	566.40	0.0211	0.15	5.88E-05	8.53
MW-11S	15-25			567.45				

Notes: Positive vertical gradient values indicate downward flow direction and negative vertical gradient values indicate upward flow direction.
The distance was calculated by taking the midpoint of the screened interval below the static water level.
Vertical velocities based on the modified Darcy equation $V_v = K_z i_v / n_e$.
Value for K_z is 25% of the average of measured hydraulic conductivities .
Value for n_e is from the Hazen and Sawyer's December 4, 1997, Letter Report to NCDENR on Groundwater Monitoring Data.

TABLE 6

Summary of Detected VOCs in Groundwater Samples
Nature and Extent Study
Randolph County Landfill, Permit No. 76-01

Detected Monitoring Constituent/Parameter	Units	Date	SWS Reporting Limit	Upgradient Wells		Downgradient Wells										Blanks	
				MW-5	MW-A3	MW-1	MW-2	MW-6	MW-7	MW-8	MW-9	MW-10S	MW-10D	MW-11S	MW-11D		
Acetone	ug/L	09/22/94	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
NC 2L = 6000 ug/L	ug/L	11/08/94	100	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	01/18/95	100	ND	--	438	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/23/96	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	06/17/97	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/16/97	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/21/98	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/07/99	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/13/99	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/05/00	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/25/00	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/04/01	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/08/02	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/21/02	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/14/03	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/01/03	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/05/04	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/18/04	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/07/05	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/06/05	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/03/06	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/03/06	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/05/07	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/18/07	100	ND	ND	514	1.5 J	1.3 J	--	ND	ND	--	--	--	--	ND	
	ug/L	04/29/08	100	ND	--	39 J	--	ND	ND	ND	ND	--	--	--	--	2.7 J	
	ug/L	10/23/08	100	ND	--	38 B	--	4.3 B	5.1 B	4.6 B	4.2 B	--	--	--	--	5.3 J	
	ug/L	04/07/09	100	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/19/09	100	ND	--	120	--	ND	ND	ND	ND	--	--	--	--	8.2 J	
	ug/L	04/28/10	100	ND	--	130	1.9 J	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/12/10	100	ND	--	300	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/11/11	100	ND	--	140	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	ug/L	10/04/11	100	ND	--	770	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/10/12	100	ND	--	460	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/15/12	100	ND	--	640	--	ND	ND	ND	ND	--	--	--	--	ND	
Benzene	ug/L	09/22/94	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
NC 2L = 1 ug/L	ug/L	11/08/94	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	01/18/95	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/23/96	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	06/17/97	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/16/97	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/21/98	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/07/99	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/13/99	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/05/00	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/25/00	5	ND	ND	5.1	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/04/01	5	ND	ND	5	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/08/02	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/21/02	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/14/03	5	ND	ND	5.2	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/01/03	5	ND	ND	6	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/05/04	5	ND	ND	5.1	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/18/04	5	ND	ND	5.9	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/07/05	5	ND	ND	5.2	ND	ND	--	--	--	--	--	--	--	--	
	ug/L	10/06/05	5	ND	ND	5.6	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/03/06	5	ND	ND	6.7	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/03/06	5	ND	ND	6	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/05/07	3	ND	ND	7.3	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/18/07	1	ND	ND	3.7	ND	ND	--	ND	ND	--	--	--	--	ND	
	ug/L	04/29/08	1	ND	--	7.4	--	ND	0.78 J	ND	ND	--	--	--	--	ND	
	ug/L	10/23/08	1	ND	--	6.6	--	ND	1.8	ND	ND	--	--	--	--	ND	
	ug/L	04/07/09	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/19/09	1	ND	--	6.3	--	ND	1.9	ND	ND	--	--	--	--	ND	
	ug/L	04/28/10	1	ND	--	7.2	ND	ND	1.3	ND	ND	--	--	--	--	ND	
	ug/L	10/12/10	1	ND	--	7.5	--	ND	2.0	ND	ND	--	--	--	--	ND	
	ug/L	04/11/11	1	ND	--	6.2	ND	ND	1.3	ND	ND	ND	ND	ND	ND	ND	
	ug/L	10/04/11	1	ND	--	ND	--	ND	2.0	ND	ND	--	--	--	--	ND	
	ug/L	04/10/12	1	ND	--	5.4 J	--	ND	1.3	ND	ND	--	--	--	--	ND	
	ug/L	10/15/12	1	ND	--	4.0 J	--	ND	1.9	ND	ND	--	--	--	--	ND	
Chlorobenzene	ug/L	09/22/94	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
NC 2L = 50 ug/L	ug/L	11/08/94	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	01/18/95	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/23/96	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	06/17/97	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/16/97	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/21/98	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/07/99	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/13/99	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/05/00	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/25/00	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/04/01	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/08/02	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/21/02	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/14/03	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/01/03	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/05/04	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/18/04	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/07/05	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/06/05	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/03/06	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/03/06	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/05/07	3	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/18/07	3	ND	ND	ND	ND	ND	--	ND	ND	--	--	--	--	ND	
	ug/L	04/29/08	3	ND	--	ND	--	ND	1.0 J	ND	ND	--	--	--	--	ND	
	ug/L	10/23/08	3	ND	--	ND	--	ND	2.5 J	ND	ND	--	--	--	--	ND	
	ug/L	04/07/09	3	ND	--	ND	--	ND	0.84 J	ND	ND	--	--	--	--	ND	
	ug/L	10/19/09	3	ND	--	ND	--	ND	2.7 J	ND	ND	--	--	--	--	ND	
	ug/L	04/28/10	3	ND	--	ND	ND	ND	1.3 J	ND	ND	--	--	--	--	ND	
	ug/L	10/12/10	3	ND	--	ND	--	ND	2.6 J	ND	ND	--	--	--	--	ND	
	ug/L	04/11/11	3	ND	--	ND	ND	ND	1.5 J	ND	ND	ND	ND	ND	ND	ND	
	ug/L	10/04/11	3	ND	--	ND	--	ND	2.7 J	ND	ND	--	--	--	--	ND	
	ug/L	04/10/12	3	ND	--	ND	--	ND	1.3 J	ND	ND	--	--	--	--	ND	
	ug/L	10/15/12	3	ND	--	ND	--	ND	2.6 J	ND	ND	--	--	--	--	ND	
Chloroethane	ug/L	09/22/94	10	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
GWPS = 3000 ug/L	ug/L	11/08/94	10	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	01/18/95	10	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/23/96	10	ND	ND	41	--	ND	38	ND	ND	--	--	--	--	ND	
	ug/L	06/17/97	10	ND	ND	12	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/16/97	10	ND	ND	33	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/21/98	10	ND	ND	33	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/07/99	10	ND	ND	47	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/13/99	10	ND	ND	40	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/05/00	10	ND	ND	50	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/25/00	10	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/04/01	10	ND	ND	38	--	ND	15	ND	ND	--	--	--	--	ND	
	ug/L	04/04/02	10	ND	ND	35.1	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/21/02	10	ND	ND	22.9	ND	ND	10.2	ND	ND	--	--	--	--	ND	
	ug/L	04/14/03	10	ND	ND	20.2	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/01/03	10	ND	ND	78.3	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/05/04	10	ND	ND	67.3	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/18/04	10	ND	ND	25.9	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/07/05	10	ND	ND	23.5	ND	ND	--	--	--	--	--	--	--	ND	
	ug/L	10/06/05	10	ND	ND	19.9	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/03/06	10	ND	ND	43.3	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/03/06	10	ND	ND	14.4	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/05/07	10	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/18/07	10	ND	ND	10.4	ND	ND	--	ND	0.4 J	--	--	--	--	ND	
	ug/L	04/29/08	10	ND	--	14	--	ND	3.1 J	ND	ND	--	--	--	--	ND	
	ug/L	10/23/08	10	ND	--	12	--	ND	7.2 J	ND	ND	--	--	--	--	ND	
	ug/L	04/07/09	10	ND	--	14	--	ND	3.1 J	ND	0.91 J	--	--	--	--	ND	
	ug/L	10/19/09	10	ND	--	5.8 J	--	ND	3.4 J	ND	ND	--	--	--	--	ND	
	ug/L	04/28/10	10	ND	--	15	2.3 J	0.75 J	3.4 J	ND	ND	--	--	--	--	ND	
	ug/L	10/12/10	10	ND	--	15	--	ND	5.3 J	ND	ND	--	--	--	--	ND	
	ug/L	04/11/11	10	ND	--	15	2.4 J	ND	ND	ND	ND	3.4 J	6.4 J	ND	ND	ND	
	ug/L	10/04/11	10	ND	--	60	--	ND	7.3 J	ND	ND	--	--	--	--	ND	
	ug/L	04/10/12	10	ND	--	53	--	ND	1.5 J	ND	ND	--	--	--	--	ND	
	ug/L	10/15/12	10	ND	--	93	--	ND	3.5 J	ND	ND	--	--	--	--	ND	
Chloroform	ug/L	09/22/94	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
NC 2L = 70 ug/L	ug/L	11/08/94	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	01/18/95	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/23/96	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	06/17/97	5	ND	ND	19	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/16/97	5	ND	ND	18	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/21/98	5	ND	ND	17	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/07/99	5	ND	ND	11	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/13/99	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/05/00	5	ND	ND	7.6	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/25/00	5	ND	ND	5.8	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/04/01	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/04/02	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/21/02	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/14/03	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/01/03	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/05/04	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/18/04	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/07/05	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/06/05	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/03/06	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/03/06	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/05/07	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/18/07	5	ND	ND	0.2 J	ND	ND	--	ND	ND	--	--	--	--	ND	
	ug/L	04/29/08	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/23/08	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/07/09	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/19/09	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/28/10	5	ND	--	ND	ND	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/12/10	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/11/11	5	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	ug/L	10/04/11	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	04/10/12	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND	
	ug/L	10/15/12	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND	

TABLE 6

Summary of Detected VOCs in Groundwater Samples
Nature and Extent Study
Randolph County Landfill, Permit No. 76-01

Detected Monitoring Constituent/Parameter	Units	Date	SWS Reporting Limit	Upgradient Wells		Downgradient Wells										Blanks
				MW-5	MW-A3	MW-1	MW-2	MW-6	MW-7	MW-8	MW-9	MW-10S	MW-10D	MW-11S	MW-11D	
1,4-Dichlorobenzene	ug/L	09/22/94	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
NC 2L = 6 ug/L	ug/L	11/08/94	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	01/18/95	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/23/96	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	06/17/97	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/16/97	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/21/98	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/99	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/13/99	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/00	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/25/00	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/04/01	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/04/02	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/21/02	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/14/03	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/01/03	5	ND	ND	6	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/04	5	ND	ND	5.6	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/04	5	ND	ND	5.3	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/05	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/06/05	5	ND	ND	7.1	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/03/06	5	ND	ND	6.7	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/03/06	5	ND	ND	8.4	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/07	3	ND	ND	6.9	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/07	1	ND	ND	5.3	ND	ND	--	ND	ND	--	--	--	--	ND
	ug/L	04/29/08	1	ND	--	5.4	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/23/08	1	ND	--	6.1	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/09	1	ND	--	5.4	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/19/09	1	ND	--	7.1	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/28/10	1	ND	--	7.9	ND	ND	0.67 J	ND	ND	--	--	--	--	ND
	ug/L	10/12/10	1	ND	--	7.7	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/11/11	1	ND	--	6.7	ND	ND	ND	ND	ND	ND	0.93 J	ND	ND	ND
	ug/L	10/04/11	1	ND	--	ND	--	ND	1.0	ND	ND	--	--	--	--	ND
	ug/L	04/10/12	1	ND	--	6.7 J	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/15/12	1	ND	--	6.6	--	ND	ND	ND	ND	--	--	--	--	ND
Dichlorodifluoromethane	ug/L	09/22/94	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
NC 2L = 1000 ug/L	ug/L	11/08/94	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	01/18/95	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/23/96	5	ND	ND	166	--	ND	38	ND	ND	--	--	--	--	ND
	ug/L	06/17/97	5	ND	ND	40	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/16/97	5	ND	ND	7.2	--	ND	ND	--	--	--	--	--	--	--
	ug/L	04/21/98	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/99	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/13/99	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/00	5	ND	ND	22	--	ND	5.8	ND	ND	--	--	--	--	ND
	ug/L	10/25/00	5	ND	ND	39	--	ND	8.8	ND	ND	--	--	--	--	ND
	ug/L	04/04/01	5	ND	ND	12	--	ND	8.1	ND	ND	--	--	--	--	ND
	ug/L	04/08/02	5	ND	ND	14.4	ND	ND	7.2	ND	ND	--	--	--	--	ND
	ug/L	10/21/02	5	ND	ND	9.6	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/14/03	5	ND	ND	ND	ND	ND	6.2	ND	ND	--	--	--	--	ND
	ug/L	10/01/03	5	ND	ND	9	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/04	5	ND	ND	6.3	ND	ND	7.1	ND	ND	--	--	--	--	ND
	ug/L	10/18/04	5	ND	ND	5.2	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/05	5	ND	ND	5.4	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/06/05	5	ND	ND	6.5	ND	ND	8.1	ND	ND	--	--	--	--	ND
	ug/L	04/03/06	5	ND	ND	6.8	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/03/06	5	ND	ND	14.8	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/07	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/07	5	ND	ND	14.8	0.4 J	ND	--	0.8 J	ND	--	--	--	--	ND
	ug/L	04/29/08	5	ND	--	ND	--	ND	1.2 J	ND	ND	--	--	--	--	ND
	ug/L	04/07/09	5	ND	--	ND	--	ND	1.8 J	0.71 J	ND	--	--	--	--	ND
	ug/L	10/19/09	5	ND	--	1.3 J	--	ND	2.0 J	0.58 J	ND	--	--	--	--	ND
	ug/L	04/28/10	5	ND	--	1.4 J	ND	ND	1.1 J	ND	ND	--	--	--	--	ND
	ug/L	04/11/11	5	ND	--	ND	ND	ND	0.63 J	ND	ND	4.0 J	ND	ND	ND	ND
	ug/L	04/10/12	5	ND	--	ND	--	ND	0.52 J	ND	ND	--	--	--	--	ND
1,1-Dichloroethane	ug/L	09/22/94	5	ND	ND	38	--	ND	ND	ND	ND	--	--	--	--	ND
NC 2L = 6 ug/L	ug/L	11/08/94	5	ND	--	22	--	ND	17	ND	ND	--	--	--	--	ND
	ug/L	01/18/95	5	ND	--	44	--	ND	13	ND	ND	--	--	--	--	ND
	ug/L	04/23/96	5	ND	ND	89	--	ND	21	ND	ND	--	--	--	--	ND
	ug/L	06/17/97	5	ND	ND	141	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/16/97	5	ND	ND	191	--	ND	13	ND	ND	--	--	--	--	ND
	ug/L	04/21/98	5	ND	ND	197	--	ND	13	ND	ND	--	--	--	--	ND
	ug/L	04/07/99	5	ND	ND	242	--	ND	17	ND	ND	--	--	--	--	ND
	ug/L	10/13/99	5	ND	ND	307	--	ND	20	ND	ND	--	--	--	--	ND
	ug/L	04/05/00	5	ND	ND	259	--	ND	26	ND	ND	--	--	--	--	ND
	ug/L	10/25/00	5	ND	6.9	227	--	ND	31	ND	ND	--	--	--	--	ND
	ug/L	04/04/01	5	ND	ND	328	--	ND	39	ND	ND	--	--	--	--	ND
	ug/L	04/08/02	5	ND	ND	291	ND	ND	15.6	ND	ND	--	--	--	--	ND
	ug/L	10/21/02	5	ND	ND	257	ND	ND	35.6	ND	ND	--	--	--	--	ND
	ug/L	04/14/03	5	ND	ND	262	ND	ND	12.8	ND	ND	--	--	--	--	ND
	ug/L	10/01/03	5	ND	ND	257	ND	ND	6.1	ND	ND	--	--	--	--	ND
	ug/L	04/05/04	5	ND	ND	234	ND	ND	13.5	ND	ND	--	--	--	--	ND
	ug/L	10/18/04	5	ND	ND	168	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/05	5	ND	ND	237	ND	ND	--	--	--	--	--	--	--	--
	ug/L	10/06/05	5	ND	ND	305	ND	ND	16.4	ND	ND	--	--	--	--	ND
	ug/L	04/03/06	5	ND	ND	347	ND	ND	5.4	ND	ND	--	--	--	--	ND
	ug/L	10/03/06	5	ND	ND	306	ND	ND	12	ND	ND	--	--	--	--	ND
	ug/L	04/05/07	5	ND	ND	298	ND	ND	6	ND	ND	--	--	--	--	ND
	ug/L	10/18/07	5	ND	ND	272	3.7 J	ND	--	2.2 J	1.2 J	--	--	--	--	ND
	ug/L	04/29/08	5	ND	--	260	--	ND	7.8	1.7 J	2.5 J	--	--	--	--	ND
	ug/L	10/23/08	5	ND	--	250	--	ND	15	2.6 J	1.4 J	--	--	--	--	ND
	ug/L	04/07/09	5	ND	--	240	--	ND	6.8	2.5 J	3.0 J	--	--	--	--	ND
	ug/L	10/19/09	5	ND	--	210	--	ND	11	2.6 J	1.1 J	--	--	--	--	ND
	ug/L	04/28/10	5	ND	--	250	21	1.1 J	6.9	2.4 J	2.7 J	--	--	--	--	ND
	ug/L	10/12/10	5	ND	--	280	--	0.59 J	12	3.9 J	1.5 J	--	--	--	--	ND
	ug/L	04/11/11	5	ND	--	170	28	ND	5.8	3.7 J	1.7 J	26	23	ND	ND	ND
	ug/L	10/04/11	5	ND	--	81	--	ND	13	5.6	1.9 J	--	--	--	--	ND
	ug/L	04/10/12	5	ND	--	99	--	ND	5.1	4.3 J	2.5 J	--	--	--	--	ND
	ug/L	10/15/12	5	ND	--	32	--	ND	6.6	5.7	0.88 J	--	--	--	--	ND
1,2-Dichloroethane	ug/L	09/22/94	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
NC 2L = 0.4 ug/L	ug/L	11/08/94	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	01/18/95	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/23/96	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	06/17/97	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/16/97	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/21/98	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/99	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/13/99	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/00	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/25/00	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/04/01	5	ND	ND	5.6	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/08/02	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/21/02	5	ND	ND	10.4	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/14/03	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/01/03	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/04	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/04	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/05	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/06/05	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/03/06	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/03/06	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/07	3	ND	ND	4	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/07	1	ND	ND	3.5	ND	ND	--	ND	ND	--	--	--	--	ND
	ug/L	04/29/08	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/23/08	1	ND	--	3.6	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/09	1	ND	--	4.6	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/19/09	1	ND	--	4.1	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/28/10	1	ND	--	3.7	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/12/10	1	ND	--	3.9	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/11/11	1	ND	--	3.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	ug/L	10/04/11	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/10/12	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/15/12	1	ND	--	4.2 J	--	ND	ND	ND	ND	--	--	--	--	ND
1,1-Dichloroethene	ug/L	09/22/94	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
NC 2L = 7 ug/L	ug/L	11/08/94	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	01/18/95	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/23/96	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	06/17/97	5	ND	ND	10	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/16/97	5	ND	ND	8.9	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/21/98	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/99	5	ND	ND	6	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/13/99	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/00	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/25/00	5	ND	ND	5.2	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/04/01	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/08/02	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/21/02	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/14/03	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/01/03	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/04	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/04	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/05	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/06/05	5	ND		ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/03/06	5	ND	ND	5.2	ND	ND	11.2	ND	ND	--	--	--	--	ND
	ug/L	10/18/07	5	ND	ND	4.7 J	0.3 J	ND	--	ND	ND	--	--	--	--	ND
	ug/L	04/29/08	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/23/08	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/09	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/19/09	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/28/10	5	ND	--	ND	0.50 J	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/12/10	5	ND	--	ND	--	ND	0.42 J	ND	ND	--	--	--	--	ND
	ug/L	04/11/11	5	ND	--	ND	0.89 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
	ug/L	10/04/11	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/10/12	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/15/12	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND

TABLE 6

Summary of Detected VOCs in Groundwater Samples
Nature and Extent Study
Randolph County Landfill, Permit No. 76-01

Detected Monitoring Constituent/Parameter	Units	Date	SWS Reporting Limit	Upgradient Wells		Downgradient Wells										Blanks
				MW-5	MW-A3	MW-1	MW-2	MW-6	MW-7	MW-8	MW-9	MW-10S	MW-10D	MW-11S	MW-11D	
cis-1,2-Dichloroethene	ug/L	09/22/94	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
NC 2L = 70 ug/L	ug/L	11/08/94	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	01/18/95	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/23/96	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	06/17/97	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/16/97	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/21/98	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/99	5	ND	ND	5.3	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/13/99	5	ND	ND	29	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/00	5	ND	ND	10	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/25/00	5	ND	ND	19	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/04/01	5	ND	ND	40	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/08/02	5	ND	ND	32.7	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/21/02	5	ND	ND	69	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/14/03	5	ND	ND	57.1	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/01/03	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/04	5	ND	ND	21.1	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/04	5	ND	ND	38.2	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/05	5	ND	ND	34.8	ND	ND	--	--	--	--	--	--	--	--
	ug/L	10/06/05	5	ND	ND	51.6	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/03/06	5	ND	ND	92.1	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/03/06	5	ND	ND	125	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/07	5	ND	ND	118	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/07	5	ND	ND	138	ND	ND	--	ND	ND	--	--	--	--	ND
	ug/L	04/29/08	5	ND	--	63	--	ND	0.63 J	ND	1.8 J	--	--	--	--	ND
	ug/L	10/23/08	5	ND	--	70	--	ND	1.4 J	0.40 J	0.80 J	--	--	--	--	ND
	ug/L	04/07/09	5	ND	--	64	--	ND	0.49 J	ND	1.8 J	--	--	--	--	ND
	ug/L	10/19/09	5	ND	--	69	--	ND	1.6 J	0.48 J	0.73 J	--	--	--	--	ND
	ug/L	04/28/10	5	ND	--	88	ND	ND	1.1 J	0.49 J	2.5 J	--	--	--	--	ND
	ug/L	10/12/10	5	ND	--	74	--	ND	1.9 J	0.69 J	0.90 J	--	--	--	--	ND
	ug/L	04/11/11	5	ND	--	45	ND	ND	1.3 J	0.83 J	1.2 J	2.6 J	3.7 J	ND	ND	ND
	ug/L	10/04/11	5	ND	--	16	--	ND	1.8 J	0.84 J	0.86 J	--	--	--	--	ND
	ug/L	04/10/12	5	ND	--	27	--	ND	1.2 J	0.85 J	3.3 J	--	--	--	--	ND
	ug/L	10/15/12	5	ND	--	11	--	ND	1.9 J	1.2 J	0.56 J	--	--	--	--	ND
trans-1,2-Dichloroethene	ug/L	09/22/94	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
NC 2L = 100 ug/L	ug/L	11/08/94	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	01/18/95	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/23/96	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	06/17/97	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/16/97	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/21/98	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/99	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/13/99	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/00	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/25/00	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/04/01	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/08/02	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/21/02	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/14/03	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/01/03	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/04	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/04	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/05	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/06/05	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/03/06	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/03/06	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/07	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/07	5	ND	ND	0.9 J	ND	ND	--	ND	ND	--	--	--	--	ND
	ug/L	04/29/08	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/23/08	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/09	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/19/09	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/28/10	5	ND	--	0.98 J	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/12/10	5	ND	--	0.88 J	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/11/11	5	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	ug/L	10/04/11	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/10/12	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/15/12	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
Ethylbenzene	ug/L	09/22/94	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
NC 2L = 600 ug/L	ug/L	11/08/94	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	01/18/95	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/23/96	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	06/17/97	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/16/97	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/21/98	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/99	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/13/99	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/00	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/25/00	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/04/01	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/08/02	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/21/02	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/14/03	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/01/03	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/04	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/04	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/05	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/06/05	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/03/06	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/03/06	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/07	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/07	1	ND	ND	0.6 J	ND	ND	--	ND	ND	--	--	--	--	ND
	ug/L	04/29/08	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/23/08	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/09	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/19/09	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/28/10	1	ND	--	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/12/10	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/11/11	1	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	ug/L	10/04/11	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/10/12	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/15/12	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
2-Hexanone	ug/L	09/22/94	50	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
GWPS = 40 ug/L	ug/L	11/08/94	50	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	01/18/95	50	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/23/96	50	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	06/17/97	50	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/16/97	50	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/21/98	50	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/99	50	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/13/99	50	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/00	50	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/25/00	50	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/04/01	50	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/08/02	50	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/21/02	50	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/14/03	50	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/01/03	50	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/04	50	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/04	50	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/05	50	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/06/05	50	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/03/06	50	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/03/06	50	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/07	50	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/07	50	ND	ND	12 J	ND	ND	--	ND	ND	--	--	--	--	ND
	ug/L	04/29/08	50	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/23/08	50	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/09	50	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/19/09	50	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/28/10	50	ND	--	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/12/10	50	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/11/11	50	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	ug/L	10/04/11	50	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/10/12	50	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/15/12	50	ND	--	6.0 J	--	ND	ND	ND	ND	--	--	--	--	ND
Chloromethane	ug/L	09/22/94	10	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
GWPS = 3 ug/L	ug/L	11/08/94	10	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	01/18/95	10	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/23/96	10	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	06/17/97	10	ND	ND	17	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/16/97	10	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/21/98	10	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/99	10	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/13/99	10	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/00	10	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/25/00	10	ND	ND	40	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/04/01	10	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/08/02	10	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/21/02	10	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/14/03	10	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/01/03	10	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/04	10	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/04	10	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/05	10	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/06/05	10	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/03/06	10	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/03/06	10	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/07	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/07	1	0.5 J	0.4 J	0.7 J	1	0.5 J	--	0.4 J	0.5 J	--	--	--	--	ND
	ug/L	04/29/08	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/23/08	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/09	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/19/09	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/28/10	1	ND	--	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/12/10	1	ND	--	1.0 B	--	0.51 B	0.94 B	0.51 B	0.53 B	--	--	--	--	0.49 J
	ug/L	04/11/11	1	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	ug/L	10/04/11	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/10/12	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/15/12	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND

TABLE 6

Summary of Detected VOCs in Groundwater Samples
Nature and Extent Study
Randolph County Landfill, Permit No. 76-01

Detected Monitoring Constituent/Parameter	Units	Date	SWS Reporting Limit	Upgradient Wells		Downgradient Wells										Blanks
				MW-5	MW-A3	MW-1	MW-2	MW-6	MW-7	MW-8	MW-9	MW-10S	MW-10D	MW-11S	MW-11D	
Methylene chloride	ug/L	09/22/94	10	ND	ND	75	--	ND	ND	ND	ND	--	--	--	--	ND
NC 2L = 5 ug/L	ug/L	11/08/94	10	ND	--	71	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	01/18/95	10	ND	--	48	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/23/96	10	ND	ND	189	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	06/17/97	10	ND	ND	164	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/16/97	10	ND	ND	429	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/21/98	10	ND	ND	210	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/99	10	ND	ND	242	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/13/99	10	ND	ND	126	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/00	10	ND	ND	184	--	ND	35	ND	ND	--	--	--	--	ND
	ug/L	10/25/00	10	ND	ND	126	--	ND	44	ND	ND	--	--	--	--	ND
	ug/L	04/04/01	10	ND	ND	28	--	ND	49	ND	ND	--	--	--	--	ND
	ug/L	04/08/02	10	ND	ND	38.4	ND	ND	18.9	ND	ND	--	--	--	--	ND
	ug/L	10/21/02	10	ND	ND	ND	ND	ND	33.6	ND	ND	--	--	--	--	ND
	ug/L	04/14/03	10	ND	ND	40.7	ND	ND	17.4	ND	ND	--	--	--	--	ND
	ug/L	10/01/03	10	ND	ND	46.1	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/04	10	ND	ND	14.8	ND	ND	14.6	ND	ND	--	--	--	--	ND
	ug/L	10/18/04	10	ND	ND	12.2	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/05	10	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/06/05	10	ND	ND	ND	ND	ND	10.4	ND	ND	--	--	--	--	ND
	ug/L	04/03/06	10	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/03/06	10	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/07	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/07	1	ND	ND	4.2	ND	ND	--	0.3 B	ND	--	--	--	--	0.2 J
	ug/L	04/29/08	1	ND	--	8.6	--	ND	7.0	ND	ND	--	--	--	--	ND
	ug/L	10/23/08	1	ND	--	ND	--	ND	11	ND	ND	--	--	--	--	ND
	ug/L	04/07/09	1	ND	--	ND	--	ND	5.4	ND	ND	--	--	--	--	ND
	ug/L	10/19/09	1	ND	--	ND	--	ND	8.5	ND	ND	--	--	--	--	ND
	ug/L	04/28/10	1	ND	--	ND	ND	ND	7.5	ND	ND	--	--	--	--	ND
	ug/L	10/12/10	1	ND	--	1.2 J	--	ND	12	ND	ND	--	--	--	--	ND
	ug/L	04/11/11	1	ND	--	1.5 J	0.90 J	ND	4.4	0.45 J	ND	0.72 J	0.52 J	ND	ND	ND
	ug/L	10/04/11	1	ND	--	ND	--	ND	7.4	0.75 J	ND	--	--	--	--	ND
	ug/L	04/10/12	1	ND	--	4.4 J	--	ND	3.8	0.34 J	ND	--	--	--	--	ND
	ug/L	10/15/12	1	ND	--	5.4	--	ND	4.6	0.47 J	ND	--	--	--	--	ND
2-Butanone	ug/L	09/22/94	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
NC 2L = 4000 ug/L	ug/L	11/08/94	100	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	01/18/95	100	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/23/96	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	06/17/97	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/16/97	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/21/98	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/99	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/13/99	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/00	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/25/00	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/04/01	100	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/08/02	100	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/21/02	100	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/14/03	100	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/01/03	100	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/04	100	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/04	100	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/05	100	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/06/05	100	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/03/06	100	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/03/06	100	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/07	100	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/07	100	ND	ND	1140	0.9 J	ND	--	ND	ND	--	--	--	--	ND
	ug/L	04/29/08	100	ND	--	20 J	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/23/08	100	ND	--	10 J	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/09	100	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/19/09	100	ND	--	91 J	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/28/10	100	ND	--	130	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/12/10	100	ND	--	280	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/11/11	100	ND	--	110	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	ug/L	10/04/11	100	ND	--	1000	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/10/12	100	ND	--	740	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/15/12	100	ND	--	1100	--	ND	ND	ND	ND	--	--	--	--	ND
4-Methyl-2-pentanone	ug/L	09/22/94	50	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
GWPS = 560 ug/L	ug/L	11/08/94	50	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	01/18/95	50	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/23/96	50	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	06/17/97	50	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/16/97	50	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/21/98	50	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/99	50	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/13/99	50	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/00	50	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/25/00	50	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/04/01	50	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/08/02	50	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/21/02	100	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/14/03	100	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/01/03	100	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/04	100	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/04	100	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/05	100	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/06/05	100	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/03/06	100	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/03/06	100	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/07	100	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/07	100	ND	ND	241	ND	ND	--	ND	ND	--	--	--	--	ND
	ug/L	04/29/08	100	ND	--	2.8 J	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/23/08	100	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/09	100	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/19/09	100	ND	--	9.4 J	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/28/10	100	ND	--	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/12/10	100	ND	--	19 J	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/11/11	100	ND	--	12 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	ug/L	10/04/11	100	ND	--	140	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/10/12	100	ND	--	120	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/15/12	100	ND	--	200	--	ND	ND	ND	ND	--	--	--	--	ND
Naphthalene	ug/L	09/22/94	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
NC 2L = 6 ug/L	ug/L	11/08/94	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	01/18/95	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/23/96	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	06/17/97	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/16/97	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/21/98	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/99	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/13/99	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/00	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/25/00	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/04/01	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/08/02	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/21/02	10	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/14/03	10	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/01/03	10	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/04	10	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/04	10	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/05	10	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/06/05	10	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/03/06	10	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/03/06	10	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/07	10	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/07	10	ND	ND	0.4 J	ND	ND	--	ND	ND	--	--	--	--	ND
	ug/L	04/29/08	10	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/09	10	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/28/10	10	ND	--	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/11/11	10	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	ug/L	04/10/12	10	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
Tetrachloroethene	ug/L	09/22/94	5	ND	--	12	--	ND	ND	ND	ND	--	--	--	--	ND
NC 2L = 0.7 ug/L	ug/L	11/08/94	5	ND	--	11	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	01/18/95	5	ND	--	14	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/23/96	5	ND	ND	15	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	06/17/97	5	ND	ND	12	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/16/97	5	ND	ND	29	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/21/98	5	ND	ND	53	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/99	5	ND	ND	65	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/13/99	5	ND	ND	67	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/00	5	ND	ND	133	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/25/00	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/04/01	5	ND	ND	85	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/08/02	5	ND	ND	146	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/21/02	5	ND	ND	66.4	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/14/03	5	ND	ND	111	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/01/03	5	ND	ND	146	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/04	5	ND	ND	124	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/04	5	ND	ND	97.1	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/05	5	ND	ND	99.1	ND	ND	--	--	--	--	--	--	--	--
	ug/L	10/06/05	5	ND	ND	96.6	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/03/06	5	ND	ND	73.9	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/03/06	5	ND	ND	38.9	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/07	3	ND	ND	24.9	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/07	1	ND	ND	6.8	ND	ND	--	0.2 J	0.3 J	--	--	--	--	ND
	ug/L	04/29/08	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/23/08	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/09	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/19/09	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/28/10	1	ND	--	ND	0.43 J	ND	ND	ND	0.49 J	--	--	--	--	ND
	ug/L	10/12/10	1	ND	--	ND	--	ND	ND	0.48 J	ND	--	--	--	--	ND
	ug/L	04/11/11	1	ND	--	ND	0.74 J	ND	ND	ND	ND	2.8	ND	ND	ND	ND
	ug/L	10/04/11	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/10/12	1	ND	--	ND	--	ND	ND	0.56 J	ND	--	--	--	--	ND
	ug/L	10/15/12	1	ND	--	ND	--	ND	ND	0.46 J	ND	--	--	--	--	ND

TABLE 6

Summary of Detected VOCs in Groundwater Samples
Nature and Extent Study
Randolph County Landfill, Permit No. 76-01

Detected Monitoring Constituent/Parameter	Units	Date	SWS Reporting Limit	Upgradient Wells		Downgradient Wells										Blanks
				MW-5	MW-A3	MW-1	MW-2	MW-6	MW-7	MW-8	MW-9	MW-10S	MW-10D	MW-11S	MW-11D	
Toluene	ug/L	09/22/94	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
NC 2L = 600 ug/L	ug/L	11/08/94	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	01/18/95	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/23/96	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	06/17/97	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/16/97	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/21/98	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/99	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/13/99	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/00	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/25/00	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/04/01	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/08/02	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/21/02	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/14/03	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/01/03	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/04	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/04	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/05	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/06/05	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/03/06	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/03/06	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/07	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/07	1	ND	ND	5.5	ND	ND	--	ND	ND	--	--	--	--	ND
	ug/L	04/29/08	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/23/08	1	ND	--	2.0 J	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/09	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/19/09	1	ND	--	3.5	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/28/10	1	ND	--	3.5	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/12/10	1	ND	--	5.2	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/11/11	1	ND	--	4.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	ug/L	10/04/11	1	ND	--	14	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/10/12	1	ND	--	16	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/15/12	1	ND	--	20	--	ND	ND	ND	ND	--	--	--	--	ND
1,1,1-Trichloroethane	ug/L	09/22/94	5	ND	ND	64	--	ND	ND	ND	ND	--	--	--	--	ND
NC 2L = 200 ug/L	ug/L	11/08/94	5	ND	--	67	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	01/18/95	5	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/23/96	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	06/17/97	5	ND	ND	16	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/16/97	5	ND	ND	35	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/21/98	5	ND	ND	23	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/99	5	ND	ND	18	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/13/99	5	ND	ND	14	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/00	5	ND	ND	13	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/25/00	5	ND	ND	12	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/04/01	5	ND	ND	9.3	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/08/02	5	ND	ND	6.6	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/21/02	5	ND	ND	6.6	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/14/03	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/01/03	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/04	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/04	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/05	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/06/05	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/03/06	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/03/06	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/07	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/07	1	ND	ND	4	ND	ND	--	ND	ND	--	--	--	--	ND
	ug/L	04/29/08	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/23/08	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/09	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/19/09	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/28/10	1	ND	--	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/12/10	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/11/11	1	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	ug/L	10/04/11	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/10/12	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/15/12	1	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
Trichloroethene	ug/L	09/22/94	5	ND	ND	68	--	ND	ND	ND	ND	--	--	--	--	ND
NC 2L = 3 ug/L	ug/L	11/08/94	5	ND	--	37	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	01/18/95	5	ND	--	64	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/23/96	5	ND	ND	34	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	06/17/97	5	ND	ND	42	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/16/97	5	ND	ND	39	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/21/98	5	ND	ND	52	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/99	5	ND	ND	52	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/13/99	5	ND	ND	56	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/00	5	ND	ND	56	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/25/00	5	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/04/01	5	ND	ND	52	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/08/02	5	ND	ND	57.8	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/21/02	5	ND	ND	44.3	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/14/03	5	ND	ND	40.7	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/01/03	5	ND	ND	54.6	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/04	5	ND	ND	44.3	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/04	5	ND	ND	44.1	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/05	5	ND	ND	39.3	ND	ND	--	--	--	--	--	--	--	--
	ug/L	10/06/05	5	ND	ND	36.6	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/03/06	5	ND	ND	30.6	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/03/06	5	ND	ND	16.5	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/07	3	ND	ND	16.5	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/07	1	ND	ND	4.8	0.5 J	ND	--	0.7 J	0.2 J	--	--	--	--	ND
	ug/L	04/29/08	1	ND	--	ND	--	ND	ND	0.67 J	0.41 J	--	--	--	--	ND
	ug/L	10/23/08	1	ND	--	ND	--	ND	0.51 J	0.95 J	ND	--	--	--	--	ND
	ug/L	04/07/09	1	ND	--	ND	--	ND	ND	0.90 J	0.46 J	--	--	--	--	ND
	ug/L	10/19/09	1	ND	--	ND	--	ND	0.53 J	1.2	ND	--	--	--	--	ND
	ug/L	04/28/10	1	ND	--	ND	ND	ND	ND	1.1	0.51 J	--	--	--	--	ND
	ug/L	10/12/10	1	ND	--	ND	--	ND	0.46 J	1.5	ND	--	--	--	--	ND
	ug/L	04/11/11	1	ND	--	ND	ND	ND	ND	1.4	ND	2.2	ND	ND	ND	ND
	ug/L	10/04/11	1	ND	--	ND	--	ND	ND	1.6	ND	--	--	--	--	ND
	ug/L	04/10/12	1	ND	--	ND	--	ND	ND	1.6	0.39 J	--	--	--	--	ND
	ug/L	10/15/12	1	ND	--	ND	--	ND	ND	1.8	ND	--	--	--	--	ND
Trichlorofluoromethane	ug/L	09/22/94	5	ND	ND	78	--	ND	19	ND	ND	--	--	--	--	ND
NC 2L = 2000 ug/L	ug/L	11/08/94	5	ND	--	138	--	ND	29	ND	ND	--	--	--	--	ND
	ug/L	01/18/95	5	ND	--	40	--	ND	20	ND	ND	--	--	--	--	ND
	ug/L	04/23/96	5	ND	ND	110	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	06/17/97	5	ND	ND	43	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/16/97	5	ND	ND	54	--	ND	14	ND	ND	--	--	--	--	ND
	ug/L	04/21/98	5	ND	ND	54	--	ND	15	ND	ND	--	--	--	--	ND
	ug/L	04/07/99	5	ND	ND	31	--	ND	9.9	ND	ND	--	--	--	--	ND
	ug/L	10/13/99	5	ND	ND	9.2	--	ND	7	ND	ND	--	--	--	--	ND
	ug/L	04/05/00	5	ND	ND	26	--	ND	6.5	ND	ND	--	--	--	--	ND
	ug/L	10/25/00	5	ND	ND	12	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/04/01	5	ND	ND	9.2	--	ND	6	ND	ND	--	--	--	--	ND
	ug/L	04/08/02	5	ND	ND	8.2	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/21/02	5	ND	ND	ND	ND	ND	6.9	ND	ND	--	--	--	--	ND
	ug/L	04/14/03	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/01/03	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/04	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/04	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/05	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/06/05	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/03/06	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/03/06	5	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/07	5	ND	ND	6.6	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/07	1	ND	ND	1.3	ND	ND	--	0.5 J	ND	--	--	--	--	ND
	ug/L	04/29/08	1	ND	--	ND	--	ND	1.1	ND	ND	--	--	--	--	ND
	ug/L	10/23/08	1	ND	--	3.2 J	--	ND	1.1	0.65 J	ND	--	--	--	--	ND
	ug/L	04/07/09	1	ND	--	ND	--	ND	1.1	0.86 J	ND	--	--	--	--	ND
	ug/L	10/19/09	1	ND	--	ND	--	ND	1.1	0.62 J	ND	--	--	--	--	ND
	ug/L	04/28/10	1	ND	--	ND	ND	ND	1.0	0.49 J	ND	--	--	--	--	ND
	ug/L	10/12/10	1	ND	--	ND	--	ND	1.8	0.66 J	ND	--	--	--	--	ND
	ug/L	04/11/11	1	ND	--	ND	ND	ND	ND	ND	ND	3.9	ND	ND	ND	ND
	ug/L	10/04/11	1	ND	--	ND	--	ND	1.7	0.73 J	ND	--	--	--	--	ND
	ug/L	04/10/12	1	ND	--	ND	--	ND	0.55 J	0.36 J	ND	--	--	--	--	ND
	ug/L	10/15/12	1	ND	--	ND	--	ND	0.72 J	ND	ND	--	--	--	--	ND
Vinyl chloride	ug/L	09/22/94	10	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
NC 2L = 0.03 ug/L	ug/L	11/08/94	10	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	01/18/95	10	ND	--	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/23/96	10	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	06/17/97	10	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/16/97	10	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/21/98	10	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/99	10	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/13/99	10	ND	ND	12	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/00	10	ND	ND	16	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/25/00	10	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/04/01	10	ND	ND	18	--	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/04/02	10	ND	ND	11.1	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/21/02	10	ND	ND	14.2	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/14/03	10	ND	ND	14.3	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/01/03	10	ND	ND	12.7	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/04	10	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/04	10	ND	ND	10.8	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/07/05	10	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/06/05	10	ND	ND	10.9	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/03/06	10	ND	ND	14.1	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/03/06	10	ND	ND	15.9	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	04/05/07	10	ND	ND	13	ND	ND	ND	ND	ND	--	--	--	--	ND
	ug/L	10/18/07	1	ND	ND	24.4	ND	ND	--	ND	ND	--	--	--	--	ND
	ug/L	04/29/08	1	ND	--	17	--	ND	0.41 J	ND	0.54 J	--	--	--	--	ND
	ug/L	10/23/08	1	ND	--	13	--	ND	0.93 J	ND	ND	--	--	--	--	ND
	ug/L	04/07/09	1	ND	--	11	--	ND	0.46 J	ND	0.71 J	--	--	--	--	ND
	ug/L	10/19/09	1	ND	--	16	--	ND	1.2	ND	ND	--	--	--	--	ND
	ug/L	04/28/10	1	ND	--	12	ND	ND	0.63 J	ND	0.64 J	--	--	--	--	ND
	ug/L	10/12/10	1	ND	--	13	--	ND	1.0	ND	ND	--	--	--	--	ND
	ug/L	04/11/11	1	ND	--	8.8	ND	ND	0.70 J	ND	ND	ND	0.63 J	ND	ND	ND
	ug/L	10/04/11	1	ND	--	ND	--	ND	1.1	ND	ND	--	--	--	--	ND
	ug/L	04/10/12	1	ND	--	6.2 J	--	ND	0.51 J	ND	0.34 J	--	--	--	--	ND
	ug/L	10/15/12	1	ND	--	ND	--	ND	1.0	ND	ND	--	--	--	--	ND

TABLE 6

Summary of Detected VOCs in Groundwater Samples
Nature and Extent Study
Randolph County Landfill, Permit No. 76-01

Detected Monitoring Constituent/Parameter	Units	Date	SWS Reporting Limit	Upgradient Wells		Downgradient Wells										Blanks
				MW-5	MW-A3	MW-1		MW-2	MW-6	MW-7		MW-8	MW-9	MW-10S	MW-10D	MW-11S	MW-11D	
Xylenes (Total)	ug/L	09/22/94	5	ND	ND	ND		--	ND	ND		ND	ND	--	--	--	--	ND
NC 2L = 500 ug/L	ug/L	11/08/94	5	ND	--	ND		--	ND	ND		ND	ND	--	--	--	--	ND
	ug/L	01/18/95	5	ND	--	ND		--	ND	ND		ND	ND	--	--	--	--	ND
	ug/L	04/23/96	5	ND	ND	ND		--	ND	ND		ND	ND	--	--	--	--	ND
	ug/L	06/17/97	5	ND	ND	ND		--	ND	ND		ND	ND	--	--	--	--	ND
	ug/L	10/16/97	5	ND	ND	ND		--	ND	ND		ND	ND	--	--	--	--	ND
	ug/L	04/21/98	5	ND	ND	ND		--	ND	ND		ND	ND	--	--	--	--	ND
	ug/L	04/07/99	5	ND	ND	ND		--	ND	ND		ND	ND	--	--	--	--	ND
	ug/L	10/13/99	5	ND	ND	ND		--	ND	ND		ND	ND	--	--	--	--	ND
	ug/L	04/05/00	5	ND	ND	ND		--	ND	ND		ND	ND	--	--	--	--	ND
	ug/L	10/25/00	5	ND	ND	ND		--	ND	ND		ND	ND	--	--	--	--	ND
	ug/L	04/04/01	5	ND	ND	ND		--	ND	ND		ND	ND	--	--	--	--	ND
	ug/L	04/04/02	5	ND	ND	ND		ND	ND	ND		ND	ND	--	--	--	--	ND
	ug/L	10/21/02	5	ND	ND	7.2		ND	ND	ND		ND	ND	--	--	--	--	ND
	ug/L	04/14/03	5	ND	ND	ND		ND	ND	ND		ND	ND	--	--	--	--	ND
	ug/L	10/01/03	5	ND	ND	ND		ND	ND	ND		ND	ND	--	--	--	--	ND
	ug/L	04/05/04	5	ND	ND	ND		ND	ND	ND		ND	ND	--	--	--	--	ND
	ug/L	10/18/04	5	ND	ND	ND		ND	ND	ND		ND	ND	--	--	--	--	ND
	ug/L	04/07/05	5	ND	ND	ND		ND	ND	ND		ND	ND	--	--	--	--	ND
	ug/L	10/06/05	5	ND	ND	ND		ND	ND	ND		ND	ND	--	--	--	--	ND
	ug/L	04/03/06	5	ND	ND	ND		ND	ND	ND		ND	ND	--	--	--	--	ND
	ug/L	10/03/06	5	ND	ND	ND		ND	ND	ND		ND	ND	--	--	--	--	ND
	ug/L	04/05/07	4	ND	ND	4.4		ND	ND	ND		ND	ND	--	--	--	--	ND
	ug/L	10/18/07	5	ND	ND	6.6		ND	ND	--		ND	ND	--	--	--	--	ND
	ug/L	04/29/08	5	ND	--	3.6	J	--	ND	ND		ND	ND	--	--	--	--	ND
	ug/L	10/23/08	5	ND	--	3.1	J	--	ND	1.2	J	ND	ND	--	--	--	--	ND
	ug/L	04/07/09	5	ND	--	ND		--	ND	ND		ND	ND	--	--	--	--	ND
	ug/L	10/19/09	5	ND	--	4.5	J	--	ND	1.2	J	ND	ND	--	--	--	--	ND
	ug/L	04/28/10	5	ND	--	3.8	J	ND	ND	0.54	J	ND	ND	--	--	--	--	ND
	ug/L	10/12/10	5	ND	--	6.0		--	ND	1.0	J	ND	ND	--	--	--	--	ND
	ug/L	04/11/11	5	ND	--	4.5	J	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND
	ug/L	10/04/11	5	ND	--	ND		--	ND	ND		ND	ND	--	--	--	--	ND
	ug/L	04/10/12	5	ND	--	8.5	J	--	ND	ND		ND	ND	--	--	--	--	ND
	ug/L	10/15/12	5	ND	--	11	J	--	ND	0.64	J	ND	ND	--	--	--	--	ND

Notes:
ug/L = micrograms per liter
ND = Not detected at the stated reporting limit for data before October 2007 and not detected at the laboratory detection limit for data from October 2007 forward
NM = Not measured
J = estimated concentration
B = Blank-qualified result
-- = no data available
Blanks = field, trip and method blanks
Shaded = concentrations above the NC 2L Groundwater Standards or Solid Waste Section Groundwater Protection Standards (GWPS) have been shaded.
SWS Reporting Limit = NCPQL or lab-specific reporting limit prior to October 2007 and NCSWSL starting in October 2007
Wells MW-2, MW-3, MW-4, MW-A1, MW-A2, and MW-A3 are not sampled as part of the compliance network.
Historical data prior to April 2008 provided by the County as taken from historical reports from Hazen and Sawyer and Environment 1.

TABLE 7

Summary of Detected VOCs in Surface Water Samples
Nature and Extent Study
Randolph County Landfill, Permit No. 76-01

Detected Monitoring Constituent/Parameter	Units	Date	SWS Reporting Limit	Upstream		Downstream		Blanks
				SW-1	SW-3	SW-2	SW-4	
Acetone	ug/L	09/22/94	100	ND	ND	ND	ND	ND
SW Standard = 2000 ug/L	ug/L	11/08/94	100	ND	ND	ND	ND	ND
	ug/L	01/18/95	100	ND	ND	ND	ND	ND
	ug/L	04/23/96	100	ND	ND	ND	ND	ND
	ug/L	06/17/97	100	ND	ND	ND	ND	ND
	ug/L	10/16/97	100	ND	ND	ND	ND	ND
	ug/L	04/21/98	100	ND	ND	ND	ND	ND
	ug/L	04/07/99	100	ND	ND	ND	ND	ND
	ug/L	10/13/99	100	ND	ND	ND	ND	ND
	ug/L	04/05/00	100	ND	ND	ND	ND	ND
	ug/L	10/25/00	100	ND	ND	ND	ND	ND
	ug/L	04/04/01	100	ND	ND	ND	ND	ND
	ug/L	04/08/02	100	ND	ND	ND	ND	ND
	ug/L	10/21/02	100	ND	ND	ND	ND	ND
	ug/L	04/14/03	100	ND	ND	ND	ND	ND
	ug/L	10/01/03	100	ND	ND	ND	ND	ND
	ug/L	04/05/04	100	ND	ND	ND	ND	ND
	ug/L	10/18/04	100	ND	ND	ND	ND	ND
	ug/L	04/07/05	100	ND	ND	ND	ND	ND
	ug/L	10/06/05	100	ND	ND	ND	ND	ND
	ug/L	04/03/06	100	ND	ND	ND	ND	ND
	ug/L	10/03/06	100	ND	ND	ND	ND	ND
	ug/L	04/05/07	100	ND	ND	ND	ND	ND
	ug/L	10/18/07	100	--	2.3 J	--	1.8 J	ND
	ug/L	04/29/08	100	3.9 B	ND	ND	10 B	2.7 J
	ug/L	10/23/08	100	Dry	5.9 B	6.2 B	5.1 B	5.3 J
	ug/L	04/07/09	100	ND	ND	ND	ND	ND
	ug/L	10/19/09	100	Dry	ND	Dry	ND	8.2 J
	ug/L	04/29/10	100	ND	ND	ND	ND	ND
	ug/L	10/13/10	100	ND	ND	ND	ND	ND
	ug/L	04/11/11	100	ND	ND	ND	ND	ND
	ug/L	10/03/11	100	ND	ND	ND	ND	ND
	ug/L	04/10/12	100	ND	ND	ND	ND	ND
	ug/L	10/15/12	100	ND	ND	ND	ND	ND
Bromodichloromethane	ug/L	09/22/94	5	ND	ND	ND	ND	ND
No SW Standard	ug/L	11/08/94	5	ND	ND	ND	ND	ND
	ug/L	01/18/95	5	ND	ND	ND	ND	ND
	ug/L	04/23/96	5	ND	ND	ND	ND	ND
	ug/L	06/17/97	5	ND	ND	ND	ND	ND
	ug/L	10/16/97	5	ND	ND	ND	ND	ND
	ug/L	04/21/98	5	ND	ND	ND	ND	ND
	ug/L	04/07/99	5	ND	ND	ND	ND	ND
	ug/L	10/13/99	5	ND	ND	ND	ND	ND
	ug/L	04/05/00	5	ND	ND	ND	ND	ND
	ug/L	10/25/00	5	ND	ND	ND	ND	ND
	ug/L	04/04/01	5	ND	ND	ND	ND	ND
	ug/L	04/08/02	5	ND	ND	ND	ND	ND
	ug/L	10/21/02	5	ND	ND	ND	ND	ND
	ug/L	04/14/03	5	ND	ND	ND	ND	ND
	ug/L	10/01/03	5	ND	ND	ND	ND	ND
	ug/L	04/05/04	5	ND	ND	ND	ND	ND
	ug/L	10/18/04	5	ND	ND	ND	ND	ND
	ug/L	04/07/05	5	ND	ND	ND	ND	ND
	ug/L	10/06/05	5	ND	ND	ND	ND	ND
	ug/L	04/03/06	5	ND	ND	ND	ND	ND
	ug/L	10/03/06	5	ND	ND	ND	ND	ND
	ug/L	04/05/07	3	ND	ND	ND	ND	ND
	ug/L	10/18/07	1	--	1.2 J	--	0.3 J	ND
	ug/L	04/29/08	1	ND	ND	ND	ND	ND
	ug/L	10/23/08	1	Dry	ND	ND	ND	ND
	ug/L	04/07/09	1	ND	ND	ND	ND	ND
	ug/L	10/19/09	1	Dry	ND	Dry	ND	ND
	ug/L	04/29/10	1	ND	ND	ND	ND	ND
	ug/L	10/13/10	1	ND	3.3	ND	ND	ND
	ug/L	04/11/11	1	ND	ND	ND	ND	ND
	ug/L	10/03/11	1	ND	ND	ND	ND	ND
	ug/L	04/10/12	1	ND	ND	ND	ND	ND
	ug/L	10/15/12	1	ND	ND	ND	ND	ND

TABLE 7

Summary of Detected VOCs in Surface Water Samples
Nature and Extent Study
Randolph County Landfill, Permit No. 76-01

Detected Monitoring Constituent/Parameter	Units	Date	SWS Reporting Limit	Upstream		Downstream		Blanks
				SW-1	SW-3	SW-2	SW-4	
Chloroform	ug/L	09/22/94	5	ND	ND	ND	ND	ND
No SW Standard	ug/L	11/08/94	5	ND	ND	ND	ND	ND
	ug/L	01/18/95	5	ND	ND	ND	ND	ND
	ug/L	04/23/96	5	ND	ND	ND	ND	ND
	ug/L	06/17/97	5	ND	ND	ND	ND	ND
	ug/L	10/16/97	5	ND	ND	ND	ND	ND
	ug/L	04/21/98	5	ND	ND	ND	ND	ND
	ug/L	04/07/99	5	ND	ND	ND	ND	ND
	ug/L	10/13/99	5	ND	ND	ND	ND	ND
	ug/L	04/05/00	5	ND	ND	ND	ND	ND
	ug/L	10/25/00	5	ND	ND	ND	ND	ND
	ug/L	04/04/01	5	ND	ND	ND	ND	ND
	ug/L	04/08/02	5	ND	ND	ND	ND	ND
	ug/L	10/21/02	5	ND	ND	ND	ND	ND
	ug/L	04/14/03	5	ND	ND	ND	ND	ND
	ug/L	10/01/03	5	ND	ND	ND	ND	ND
	ug/L	04/05/04	5	ND	ND	ND	ND	ND
	ug/L	10/18/04	5	ND	ND	ND	ND	ND
	ug/L	04/07/05	5	ND	ND	ND	ND	ND
	ug/L	10/06/05	5	ND	ND	ND	ND	ND
	ug/L	04/03/06	5	ND	ND	ND	ND	ND
	ug/L	10/03/06	5	ND	ND	ND	ND	ND
	ug/L	04/05/07	5	ND	ND	ND	ND	ND
	ug/L	10/18/07	5	--	2.3 J	--	0.9 J	ND
	ug/L	04/29/08	5	ND	ND	ND	ND	ND
	ug/L	10/23/08	5	Dry	0.51 J	ND	0.57 J	ND
	ug/L	04/07/09	5	ND	ND	ND	ND	ND
	ug/L	10/19/09	5	Dry	0.44 J	Dry	0.56 J	ND
	ug/L	04/29/10	5	ND	ND	ND	ND	ND
	ug/L	10/13/10	5	ND	1.6 J	ND	0.44 J	ND
	ug/L	04/11/11	5	ND	ND	ND	ND	ND
	ug/L	10/03/11	5	ND	ND	ND	ND	ND
	ug/L	04/10/12	5	ND	ND	ND	0.34 J	ND
	ug/L	10/15/12	5	ND	ND	ND	0.92 J	ND
Dibromochloromethane	ug/L	09/22/94	5	ND	ND	ND	ND	ND
No SW Standard	ug/L	11/08/94	5	ND	ND	ND	ND	ND
	ug/L	01/18/95	5	ND	ND	ND	ND	ND
	ug/L	04/23/96	5	ND	ND	ND	ND	ND
	ug/L	06/17/97	5	ND	ND	ND	ND	ND
	ug/L	10/16/97	5	ND	ND	ND	ND	ND
	ug/L	04/21/98	5	ND	ND	ND	ND	ND
	ug/L	04/07/99	5	ND	ND	ND	ND	ND
	ug/L	10/13/99	5	ND	ND	ND	ND	ND
	ug/L	04/05/00	5	ND	ND	ND	ND	ND
	ug/L	10/25/00	5	ND	ND	ND	ND	ND
	ug/L	04/04/01	5	ND	ND	ND	ND	ND
	ug/L	04/08/02	5	ND	ND	ND	ND	ND
	ug/L	10/21/02	5	ND	ND	ND	ND	ND
	ug/L	04/14/03	5	ND	ND	ND	ND	ND
	ug/L	10/01/03	5	ND	ND	ND	ND	ND
	ug/L	04/05/04	5	ND	ND	ND	ND	ND
	ug/L	10/18/04	5	ND	ND	ND	ND	ND
	ug/L	04/07/05	5	ND	ND	ND	ND	ND
	ug/L	10/06/05	5	ND	ND	ND	ND	ND
	ug/L	04/03/06	5	ND	ND	ND	ND	ND
	ug/L	10/03/06	5	ND	ND	ND	ND	ND
	ug/L	04/05/07	3	ND	ND	ND	ND	ND
	ug/L	10/18/07	3	--	0.8 J	--	0.2 J	ND
	ug/L	04/29/08	3	ND	ND	ND	ND	ND
	ug/L	10/23/08	3	Dry	ND	ND	ND	ND
	ug/L	04/07/09	3	ND	ND	ND	ND	ND
	ug/L	10/19/09	3	Dry	ND	Dry	ND	ND
	ug/L	04/29/10	3	ND	ND	ND	ND	ND
	ug/L	10/13/10	3	ND	4.0	ND	ND	ND
	ug/L	04/11/11	3	ND	ND	ND	ND	ND
	ug/L	10/03/11	3	ND	ND	ND	ND	ND
	ug/L	04/10/12	3	ND	ND	ND	ND	ND
	ug/L	10/15/12	3	ND	ND	ND	ND	ND

TABLE 7

Summary of Detected VOCs in Surface Water Samples
Nature and Extent Study
Randolph County Landfill, Permit No. 76-01

Detected Monitoring Constituent/Parameter	Units	Date	SWS Reporting Limit	Upstream		Downstream		Blanks
				SW-1	SW-3	SW-2	SW-4	
1,1-Dichloroethane	ug/L	09/22/94	5	ND	ND	ND	ND	ND
SW Standard = 20,000 ug/L	ug/L	11/08/94	5	ND	ND	ND	ND	ND
	ug/L	01/18/95	5	ND	ND	ND	ND	ND
	ug/L	04/23/96	5	ND	ND	6	ND	ND
	ug/L	06/17/97	5	ND	ND	ND	ND	ND
	ug/L	10/16/97	5	ND	ND	ND	ND	ND
	ug/L	04/21/98	5	ND	ND	ND	ND	ND
	ug/L	04/07/99	5	ND	ND	ND	ND	ND
	ug/L	10/13/99	5	ND	ND	ND	ND	ND
	ug/L	04/05/00	5	ND	ND	ND	ND	ND
	ug/L	10/25/00	5	ND	ND	ND	ND	ND
	ug/L	04/04/01	5	ND	ND	ND	ND	ND
	ug/L	04/08/02	5	ND	ND	ND	ND	ND
	ug/L	10/21/02	5	ND	ND	ND	ND	ND
	ug/L	04/14/03	5	ND	ND	ND	ND	ND
	ug/L	10/01/03	5	ND	ND	ND	ND	ND
	ug/L	04/05/04	5	ND	ND	ND	ND	ND
	ug/L	10/18/04	5	ND	ND	ND	ND	ND
	ug/L	04/07/05	5	ND	ND	ND	ND	ND
	ug/L	10/06/05	5	ND	ND	ND	ND	ND
	ug/L	04/03/06	5	ND	ND	ND	ND	ND
	ug/L	10/03/06	5	ND	ND	ND	ND	ND
	ug/L	04/05/07	5	ND	ND	ND	ND	ND
	ug/L	10/18/07	5	ND	ND	ND	ND	ND
	ug/L	04/29/08	5	ND	ND	1.5 J	1.9 J	ND
	ug/L	10/23/08	5	Dry	ND	ND	ND	ND
	ug/L	04/07/09	5	ND	ND	0.55 J	ND	ND
	ug/L	10/19/09	5	Dry	ND	Dry	ND	ND
	ug/L	04/29/10	5	ND	ND	ND	ND	ND
	ug/L	10/13/10	5	ND	ND	ND	ND	ND
	ug/L	04/11/11	5	ND	ND	0.64 J	ND	ND
	ug/L	10/03/11	5	ND	1.0 J	ND	ND	ND
	ug/L	04/10/12	5	ND	0.48 J	ND	ND	ND
	ug/L	10/15/12	5	ND	ND	ND	ND	ND
Chloromethane	ug/L	09/22/94	10	ND	ND	ND	ND	ND
No SW Standard	ug/L	11/08/94	10	ND	ND	ND	ND	ND
	ug/L	01/18/95	10	ND	ND	ND	ND	ND
	ug/L	04/23/96	10	ND	ND	ND	ND	ND
	ug/L	06/17/97	10	ND	ND	ND	ND	ND
	ug/L	10/16/97	10	ND	ND	ND	ND	ND
	ug/L	04/21/98	10	ND	ND	ND	ND	ND
	ug/L	04/07/99	10	ND	ND	ND	ND	ND
	ug/L	10/13/99	10	ND	ND	ND	ND	ND
	ug/L	04/05/00	10	ND	ND	ND	ND	ND
	ug/L	10/25/00	10	ND	ND	ND	ND	ND
	ug/L	04/04/01	10	ND	ND	ND	ND	ND
	ug/L	04/08/02	10	ND	ND	ND	ND	ND
	ug/L	10/21/02	10	ND	ND	ND	ND	ND
	ug/L	04/14/03	10	ND	ND	ND	ND	ND
	ug/L	10/01/03	10	ND	ND	ND	ND	ND
	ug/L	04/05/04	10	ND	ND	ND	ND	ND
	ug/L	10/18/04	10	ND	ND	ND	ND	ND
	ug/L	04/07/05	10	ND	ND	ND	ND	ND
	ug/L	10/06/05	10	ND	ND	ND	ND	ND
	ug/L	04/03/06	10	ND	ND	ND	ND	ND
	ug/L	10/03/06	10	ND	ND	ND	ND	ND
	ug/L	04/05/07	5	ND	ND	ND	ND	ND
	ug/L	10/18/07	1	--	0.6 J	--	0.4 J	ND
	ug/L	04/29/08	1	ND	ND	ND	ND	ND
	ug/L	10/23/08	1	Dry	ND	ND	ND	ND
	ug/L	04/07/09	1	ND	ND	ND	ND	ND
	ug/L	10/19/09	1	Dry	ND	Dry	ND	ND
	ug/L	04/29/10	1	ND	ND	ND	ND	ND
	ug/L	10/13/10	1	ND	ND	ND	ND	0.49 J
	ug/L	04/11/11	1	ND	ND	ND	ND	ND
	ug/L	10/03/11	1	ND	ND	ND	ND	ND
	ug/L	04/10/12	1	ND	ND	ND	ND	ND
	ug/L	10/15/12	1	ND	ND	ND	ND	ND

Notes:
ug/L = micrograms per liter
ND = Not detected at the stated reporting limit for data before October 2007 and not detected at the laboratory detection limit
J = Estimated concentration
B = Blank-qualified result
-- = no data available
SW Standard = Surface Water Standard based on Freshwater Aquatic Life Classification
Blanks = field, trip and method blanks
SWS Reporting Limit = NCPQL or lab-specific reporting limit prior to October 2007 and NCSWSL starting in October 2007
Historical data prior to April 2008 provided by the County and taken from historical reports from Hazen and Sawyer and Environment 1.

TABLE 8

Summary of Detected VOCs From Headspace Samples
Nature and Extent Study
Randolph County Landfill, Permit No. 76-01

Parameter	Units	Date	MW-1		MW-7	MW-8	
Acetone	ppbv	04/12/11	ND		39	ND	
Benzene	ppbv	04/12/11	19	J	ND	ND	
Chloroethane	ppbv	04/12/11	110		ND	ND	
1,4-Dichlorobenzene	ppbv	04/12/11	24		ND	ND	
1,1-Dichloroethane	ppbv	04/12/11	590		4.8	44	
1,1-Dichloroethene	ppbv	04/12/11	16	J	ND	ND	
cis-1,2-Dichloroethene	ppbv	04/12/11	99		ND	ND	
2-Butanone	ppbv	04/12/11	ND		3.2	ND	
Carbon Disulfide	ppbv	04/12/11	ND		ND	9.0	J
Trichloroethene	ppbv	04/12/11	3.1		ND	21	
Trichlorofluoromethane	ppbv	04/12/11	ND		11	22	
Vinyl chloride	ppbv	04/12/11	46		ND	ND	
	Total VOCs:		**907**		**58.0**	**96.0**	

Notes:
ppbv = parts per billion by volume
ND = Not detected at the stated reporting limit
J = estimated concentration
VOCs = volatile organic compounds

TABLE 9

Summary of Physical and Chemical Characteristics of Constituents-of-Concern
Nature and Extent Study
Randolph County Landfill, Permit No. 76-01

Constituent	CAS Number	Boiling Point (degrees C)	Melting Point (degrees C)	Solubility in Water (mg/l)	Vapor Pressure (mm Hg)	Henry's Law Constant (atm-m^3/mol)	Specific Gravity (H_2O = 1)	Log Kow	Log Koc
Benzene	71-43-2	80.1	5.5	1780	95	5.55E-03	0.8765	2.13	1.8
1,4-Dichlorobenzene	106-46-7	174	53.1	79	1.8	4.33E-03	1.2475	3.39	3.26
1,1-Dichloroethane	75-34-3	57.3	-97	5500	234	5.87E-03	1.1757	1.79	1.76
1,2-Dichloroethane	107-06-2	83.5	-35.3	8690	79	1.18E-03	1.2351	1.45	1.62
Methylene Chloride	75-09-2	40	-95.1	16,700	429	3.19E-03	1.3266	1.25	25
Tetrachloroethene	127-18-4	121	-19	150	19.0	2.69E-02	1.62	2.53	2.48
Vinyl Chloride	75-01-4	-13.4	-153.8	1100	2580	2.78E-02	0.9106	0.60	1.99

Notes: NA: Not Available

mg/l = milligrams per liter

Kow = octonal-water partition coefficient

Koc = soil adsorption coefficient

atm-m3/mol = atmospheres - $meters^3$ per mole

^oC = degrees Celcius

Solubility reported at 20 degrees Centigrade except 1,4-dichlorobenzene; tetrachloroethene; and vinyl chloride, which are reported for 25 degrees Centigrade.

Vapor pressure reported at 25 degrees Centigrade except vinyl chloride, which is reported for 20 degrees Centigrade; and 1,4-dichlorobenzene, which is reported at 30 degrees Centigrade.

Henry's Law Constant reported at 25 degrees centigrade.

Specific gravity reported at 20 degreees Centigrade

Sources: Handbook of RCRA Ground-Water Monitoring Constituents: Chemical and Physical Properties, USEPA, 1992

Toxicological Profiles, Agency for Toxic Substances and Disease Registry, CRC Press, Inc., 1997.

TABLE 10

Summary of Geochemical Indicators
Nature and Extent Study
Randolph County Landfill, Permit No. 76-01

Detected Monitoring Constituent/Parameter	Units	Date	SWS Reporting Limit	Upgradient Wells	Downgradient Wells										Blanks
				MW-5	MW-1	MW-2	MW-6	MW-7	MW-8	MW-9	MW-10S	MW-10D	MW-11S	MW-11D	
Sodium Total	ug/L	04/11/11	--	19700	5610	7210	7470	3580	15200	25400	7350	29800	5900	12100	ND
Calcium Total	ug/L	04/11/11	--	70300	89400	5840	4750	13300	25000	44700	21700	180000	5540	22800	ND
Magnesium Total	ug/L	04/11/11	--	70300	33300	3600	4090	5280	4640	23400	13400	60700	1740	7170	ND
Potassium Total	ug/L	04/11/11	--	461 J	ND	445 J	691	305 J	278 J	201 J	792	39400	311 J	994	ND
Sulfide	mg/L	04/11/11	1	ND	0.064 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloride	mg/L	04/11/11	--	8.4 B	74	22	5 B	20	10	16	32	270	5.3 B	4.5 B	1.9
Nitrate as N	mg/L	04/11/11	10	1.2 J	0.067 J	ND	3.4 J	3.3 J	1.9 J	ND	ND	ND	ND	ND	--
Nitrite as N	mg/L	04/11/11	1	ND	ND	ND	0.0069 B	ND	ND	ND	ND	0.0053 B	ND	ND	0.0038 J
Sulfate as SO4	mg/L	04/11/11	250	9.7 J	2 J	6.4 J	4.3 J	2.1 J	2.1 J	15 J	15 J	35 J	4.5 J	4.2 J	ND
Total Alkalinity as CaCO3	mg/L	04/11/11	--	460	330	ND	23	26	88	190	43	330	18	98	ND
Total Organic Carbon	mg/L	04/11/11	--	1.6	20	6.4	1	1.3	0.85 J	1.6	1.5	6.9	0.62 J	0.71 J	ND
Nitrate/Nitrite as N	mg/L	04/11/11	--	1.2	0.067 J	ND	3.4	3.3	1.9	ND	ND	ND	0.079 J	ND	ND
Ethane	ug/L	04/11/11	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethene	ug/L	04/11/11	--	ND	1.85 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methane	ug/L	04/11/11	--	ND	3340	ND	ND	1620	0.640 J	ND	ND	4.30	ND	ND	ND
Hexanoic Acid	ug/L	04/11/11	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HIBA (2-Hydroxyisobutyric Acid)	ug/L	04/11/11	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
iso-Hexanoic Acid	ug/L	04/11/11	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
iso-Pentanoic Acid	ug/L	04/11/11	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentanoic Acid	ug/L	04/11/11	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon dioxide	ug/L	04/11/11	--	42600	440000	167000	65000	307000	62300	138000	ND	79000	53200	13300	ND
Pyruvic Acid	ug/L	04/11/11	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lactic Acid	ug/L	04/11/11	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetic Acid	ug/L	04/11/11	--	ND	34000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Propionic Acid	ug/L	04/11/11	--	ND	2800	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Butyric Acid	ug/L	04/11/11	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hydrogen	nM	04/11/11	--	2.700	1.100	0.750	2.400	0.930	0.740	1.800	2.000	1.800	0.900	2.100	--
pH (field)	S.U.	04/11/11	--	6.63	5.67	4.52	5.13	4.61	5.80	5.81	5.45	6.35	5.08	6.57	--
Conductivity (field)	uS/cm	04/11/11	--	884	942	132	94	112	214	468	267	1665	71	219	--
Temperature (field)	Celsius	04/11/11	--	16.62	16.31	15.45	12.82	16.42	14.68	15.37	15.38	15.97	16.86	16.35	--
Turbidity (field)	NTU	04/11/11	--	4.39	2.67	91.4	25.3	16.7	34.7	2.43	5.35	19.9	2.76	10.3	--
Dissolved Oxygen (field)	mg/L	04/11/11	--	2.69	0.50	0.97	4.95	1.10	4.24	1.52	1.67	3.20	2.07	3.01	--
ORP (field)	mV	04/11/11	--	150.2	-13.6	236.6	219.8	238.4	166.7	181.7	157.8	119.1	179.3	92.3	--

Notes:
mg/L = milligrams per liter
NM = nanomolar
J = estimated concentration
-- = no data available
Blanks = method blanks
NTU = Nephelometric Turbidity Units
mV = millivolts
S.U. = Standard Units

TABLE 11

Calculated Gas Concentrations Based on Concentrations of VOCs in Groundwater and Henry's Law Nature and Extent Study Randolph County Landfill, Permit No. 76-01

Parameter	SWSL (ug/L)	NC 2L Standard (ug/L)	GWPS (ug/L)	Observed Groundwater Concentrations (ug/L)			Henry's Law Constant (Dimensionless)	Calculated Gas Concentrations (ug/L-gas)			ug/L to ppb Conversion	Calculated Gas Concentrations (ppb v/v)			Observed Headspace Concentrations (ppb v/v)		
				MW-1	MW-7	MW-8		MW-1	MW-7	MW-8		MW-1	MW-7	MW-8	MW-1	MW-7	MW-8
Acetone	100	6000		140	ND	ND	1.59E-03	0.22	ND	ND	2.37E-03	94	ND	ND	ND	39	ND
Benzene	1	1	--	6.2	1.3	ND	2.26E-01	1.40	0.29	ND	3.19E-03	438	92	ND	19	ND	ND
2-Butanone	100	4000	--	110	ND	ND	5.66E-03	0.62	ND	ND	2.95E-03	211	ND	ND	ND	3.2	ND
Carbon Disulfide	100	700	--	ND	ND	ND	1.24E+00	ND	ND	ND	3.11E-03	ND	ND	ND	ND	ND	9.0
Chlorobenzene	3	50	--	ND	1.5	ND	1.61E-01	ND	0.24	ND	4.61E-03	ND	52	ND	ND	ND	ND
Chloroethane	10	--	3000	15	ND	ND	4.55E-01	6.8	ND	ND	2.64E-03	2589	ND	ND	110	ND	ND
1,4-Dichlorobenzene	1	6	--	6.7	ND	ND	1.12E-01	0.747	ND	ND	6.01E-03	124	ND	ND	24	ND	ND
Dichlorodifluoromethane	5	1000	--	ND	0.63	ND	1.23E+02	ND	77	ND	4.94E-03	ND	15686	ND	ND	ND	ND
1,1-Dichloroethane	5	6	--	170	5.8	3.7	2.23E-01	38	1.3	0.83	4.05E-03	9379	320	204	590	4.8	44
1,2-Dichloroethane	1	0.4	--	3.3	ND	ND	4.51E-02	0.15	ND	ND	4.05E-03	37	ND	ND	ND	ND	ND
1,1-Dichloroethene	5	7	--	ND	ND	ND	6.11E-01	ND	ND	ND	4.05E-03	ND	ND	ND	16	ND	ND
cis-1,2-Dichloroethene	5	70	--	45	1.3	0.83	1.67E-01	7.5	0.22	0.14	3.97E-03	1893	55	35	99	ND	ND
Methylene Chloride	1	5	--	1.5	4.4	0.45	1.31E-01	0.20	0.58	0.06	3.47E-03	57	166	17	ND	ND	ND
4-Methyl-2-Pentanone	100	--	560	12	ND	ND	5.66E-03	0.07	ND	ND	4.09E-03	17	ND	ND	ND	ND	ND
Tetrachloroethene	1	0.7	--	ND	ND	ND	7.54E-01	ND	ND	ND	6.78E-03	ND	ND	ND	ND	ND	ND
Toluene	1	600	--	4.3	ND	ND	2.74E-01	1.2	ND	ND	3.77E-03	312	ND	ND	ND	ND	ND
Trichloroethene	1	3	--	ND	ND	1.4	3.74E-01	ND	ND	0.52	5.37E-03	ND	ND	97	3.1	ND	21
Trichlorofluoromethane	1	2000	--	ND	ND	ND	4.51E+00	ND	ND	ND	5.61E-03	ND	ND	ND	ND	11	22
Vinyl Chloride	1	0.03	--	8.8	0.70	ND	1.14E+00	10	0.80	ND	2.56E-03	3918	312	ND	ND	ND	ND
Xylenes	5	500	--	4.5	ND	ND	2.16E-01	0.97	ND	ND	4.34E-03	224	ND	ND	46	ND	ND

Notes:

1. ug/L = micrograms per liter
2. Calculated gas concentrations based on groundwater concentrations from the October 2011 sampling event
3. Values obtained from Table 2 - Summary of Non-Methane organic Compounds in Various Landfills in "A Review of the Literature Regarding Non-Methane and Volatile Organic Compounds In Municipal Solid Waste Landfill Gas" by Hamideh Soltani-Ahmadi and the 1996 EPA, Soil Screening Users Guidance; EPA/540/R-96/018
4. Henry's Law Constant = dimensionless value
5. -- = not calculated
6. ND = Not Detected
7. ppb = parts per billion
8. ppb v/v = parts per billion on a volume by volume basis
9. Observed Groundwater Concentrations are from Table 6, which also shows several detections that have been flagged by the laboratory as estimated values
10. NC 2L Standard = the North Carolina groundwater standards
11. SWSL = Solid Waste Section Limit

TABLE 12

Calculated Groundwater Concentrations
Based on Analytical Results of Headspace Samples
Nature and Extent Study
Randolph County Landfill, Permit No. 76-01

PARAMETER	Observed Headspace Samples (ppbv)			ug/L to ppb conversion	Gas Concentrations (ug/L-gas)			Henry's Law Constant	Calculated Water Concentrations (ug/L)			Observed Groundwater Samples (ug/L)			SWSL (ug/L)	NC 2L Standard (ug/L)	GWPS (ug/L)
	MW-1	MW-7	MW-8	ppb (v/v)	MW-1	MW-7	MW-8		MW-1	MW-7	MW-8	MW-1	MW-7	MW-8			
Acetone	ND	39	ND	2.37E-03	--	0.09	--	1.59E-03	--	58	--	140	ND	ND	100	6000	
Benzene	19	ND	ND	3.19E-03	0.06	--	--	2.26E-01	0.27	--	--	**6.2**	**1.3**	ND	1	1	--
2-Butanone	ND	3.2	ND	2.95E-03	--	0.009	--	5.66E-03	--	1.7	--	110	ND	ND	100	4000	--
Carbon Disulfide	ND	ND	9.0	3.11E-03	--	--	0.03	1.24E+00	--	--	0.02	ND	ND	ND	100	700	--
Chlorobenzene	ND	ND	ND	4.61E-03	--	--	--	1.61E-01	--	--	--	ND	1.5	ND	3	50	--
Chloroethane	110	ND	ND	2.64E-03	0.29	--	--	4.55E-01	0.64	--	--	15	ND	ND	10	--	3000
1,4-Dichlorobenzene	24	ND	ND	6.01E-03	0.14	--	--	1.12E-01	1.3	--	--	**6.7**	ND	ND	1	6	--
Dichlorodifluoromethane	ND	ND	ND	4.94E-03	--	--	--	1.23E+02	--	--	--	ND	0.63	ND	5	1000	--
1,1-Dichloroethane	590	4.8	44	4.05E-03	2.4	0.02	0.18	2.23E-01	**11**	0.09	0.80	**170**	5.8	3.7	5	6	--
1,2-Dichloroethane	ND	ND	ND	4.05E-03	--	--	--	4.51E-02	--	--	--	**3.3**	ND	ND	1	0.4	--
1,1-Dichloroethene	16	ND	ND	4.05E-03	0.065	--	--	6.11E-01	0.11	--	--	ND	ND	ND	5	7	--
cis-1,2-Dichloroethene	99	ND	ND	3.97E-03	0.393	--	--	1.67E-01	2.4	--	--	45	1.3	0.83	5	70	--
Methylene Chloride	ND	ND	ND	3.47E-03	--	--	--	1.31E-01	--	--	--	1.5	4.4	0.45	1	5	--
4-Methyl-2-Pentanone	ND	ND	ND	4.09E-03	--	--	--	5.66E-03	--	--	--	12	ND	ND	100	--	560
Tetrachloroethene	ND	ND	ND	6.78E-03	--	--	--	7.54E-01	--	--	--	ND	ND	ND	1	0.7	--
Toluene	ND	ND	ND	3.77E-03	--	--	--	2.74E-01	--	--	--	4.3	ND	ND	1	600	--
Trichloroethene	3.1	ND	21	5.37E-03	0.02	--	0.11	3.74E-01	0.04	--	0.30	ND	ND	1.4	1	3	--
Trichlorofluoromethane	ND	11	22	5.61E-03	0.15	0.11	0.13	4.51E+00	0.03	0.02	0.03	ND	ND	ND	1	2000	--
Vinyl Chloride	ND	ND	ND	2.56E-03	--	--	--	1.14E+00	--	--	--	**8.8**	**0.70**	ND	1	0.03	--
Xylenes	46	ND	ND	4.34E-03	0.20	--	--	2.16E-01	0.92	--	--	4.5	ND	ND	5	500	--

Notes:
1) ug/L = micrograms per liter
2) Calculated groundwater concentrations based on headspace gas sample analyses from the March 2010 sampling event.
3) Values obtained from Table 2 - Summary of Non-Methane organic Compounds in Various Landfills in "A Review of the Literature Regarding Non-Methane and Volatile Organic Compounds In Municipal Solid Waste Landfill Gas" by Hamideh Soltani-Ahmadi and from the 1996, EPA, Soil Screening User Guidance, EPA/540/r-96/018.
4) Henry's Law Constant = dimensionless value
5) ppbv = parts per billion by volume
6) -- = not calculated
7) Bold = calculated concentrations greater than 2L Groundwater Standard
8) ND = not detected
9) Shaded cells = identified as constituents of concern for the facility as discussed in text
10) ppb (v/v) = parts per billion on a volume by volume basis
11) NC 2L Standard = the North Carolina groundwater standards
12) SWSL = Solid Waste Section Limit

TABLE 13

Summary of Detected VOCs during Nature and Extent Study
Nature and Extent Study
Randolph County Landfill, Permit No. 76-01

Parameter	Units	SWSL	NC 2L	GWPS	Monitoring Well and Sampling Date										
					MW-5	MW-1	MW-2	MW-6	MW-7	MW-8	MW-9	MW-10S	MW-10D	MW-11S	MW-11D
Acetone	ug/L	100	6000	--	ND	140	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ug/L	1	1	--	ND	6.2	ND	ND	1.3	ND	ND	ND	ND	ND	ND
Chlorobenzene	ug/L	3	50	--	ND	ND	ND	ND	1.5 J	ND	ND	ND	ND	ND	ND
Chloroethane	ug/L	10	--	3000	ND	15	2.4 J	ND	ND	ND	ND	3.4 J	6.4 J	ND	ND
1,4-Dichlorobenzene	ug/L	1	6	--	ND	6.7	ND	ND	ND	ND	ND	ND	0.93 J	ND	ND
Dichlorodifluoromethane	ug/L	5	1000	--	ND	ND	ND	ND	0.63 J	ND	ND	4.0 J	ND	ND	ND
1,1-Dichloroethane	ug/L	5	6	--	ND	170	28	ND	5.8	3.7 J	1.7 J	26	23	ND	ND
1,2-Dichloroethane	ug/L	1	0.4	--	ND	3.3	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ug/L	5	7	--	ND	ND	0.89 J	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ug/L	5	70	--	ND	45	ND	ND	1.3 J	0.83 J	1.2 J	2.6 J	3.7 J	ND	ND
Methylene chloride	ug/L	1	5	--	ND	1.5 J	0.90 J	ND	4.4	0.45 J	ND	0.72 J	0.52 J	ND	ND
2-Butanone	ug/L	100	4000	--	ND	110	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	ug/L	100	--	560	ND	12 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ug/L	1	0.7	--	ND	ND	0.74 J	ND	ND	ND	ND	2.8	ND	ND	ND
Toluene	ug/L	1	600	--	ND	4.3	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ug/L	1	3	--	ND	ND	ND	ND	ND	1.4	ND	2.2	ND	ND	ND
Trichlorofluoromethane	ug/L	1	2000	--	ND	ND	ND	ND	ND	ND	ND	3.9	ND	ND	ND
Vinyl chloride	ug/L	1	0.03	--	ND	8.8	ND	ND	0.70 J	ND	ND	ND	0.63 J	ND	ND
Xylenes (Total)	ug/L	5	500	--	ND	4.5 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
		Total VOCs:			**0.0**	**527**	**32.9**	**0.0**	**15.6**	**6.4**	**2.9**	**45.6**	**35.2**	**0.0**	**0.0**

Notes:
ug/L = micrograms per liter
ND = Not detected at the stated reporting limit
J = estimated concentration
SWSL = Solid Waste Section Reporting Limit
NC 2L = North Carolina 2L Groundwater Standard
Shaded = concentrations above the NC 2L Groundwater Standards have been shaded.
VOCs = volatile organic compounds

FIGURES

Natural Attenuation Screening Protocol

The following is taken from the USEPA protocol (USEPA, 1998). The results of this scoring process have no regulatory significance.

Interpretation	Score
Inadequate evidence for anaerobic biodegradation* of chlorinated organics	0 to 5
Limited evidence for anaerobic biodegradation* of chlorinated organics	6 to 14
Adequate evidence for anaerobic biodegradation* of chlorinated organics	15 to 20
Strong evidence for anaerobic biodegradation* of chlorinated organics	>20

* reductive dechlorination

Score: 23

Scroll to End of Table

Analysis	Concentration in Most Contam. Zone	Interpretation	Yes	No	Points Awarded
Oxygen*	<0.5 mg/L	Tolerated, suppresses the reductive pathway at higher concentrations	○	◉	0
	> 5mg/L	Not tolerated; however, VC may be oxidized aerobically	○	◉	0
Nitrate*	<1 mg/L	At higher concentrations may compete with reductive pathway	◉	○	2
Iron II*	>1 mg/L	Reductive pathway possible; VC may be oxidized under Fe(III)-reducing conditions	○	◉	0
Sulfate*	<20 mg/L	At higher concentrations may compete with reductive pathway	◉	○	2
Sulfide*	>1 mg/L	Reductive pathway possible	○	◉	0
Methane*	>0.5 mg/L	Ultimate reductive daughter product, VC Accumulates	◉	○	3
Oxidation Reduction Potential* (ORP)	<50 millivolts (mV)	Reductive pathway possible	◉	○	1
	<-100mV	Reductive pathway likely	○	◉	0
pH*	5 < pH < 9	Optimal range for reductive pathway	◉	○	0
TOC	>20 mg/L	Carbon and energy source; drives dechlorination; can be natural or anthropogenic	○	◉	0
Temperature*	>20°C	At T >20°C biochemical process is accelerated	○	◉	0
Carbon Dioxide	>2x background	Ultimate oxidative daughter product	○	◉	0
Alkalinity	>2x background	Results from interaction of carbon dioxide with aquifer minerals	○	◉	0
Chloride*	>2x background	Daughter product of organic chlorine	◉	○	2
Hydrogen	>1 nM	Reductive pathway possible, VC may accumulate	◉	○	3
Volatile Fatty Acids	>0.1 mg/L	Intermediates resulting from biodegradation of aromatic compounds; carbon and energy source	◉	○	2
BTEX*	>0.1 mg/L	Carbon and energy source; drives dechlorination	○	◉	0
PCE*		Material released	○	◉	0
TCE*		Daughter product of PCE [a/]	○	◉	0
DCE*		Daughter product of TCE. If cis is greater than 80% of total DCE it is likely a daughter product of TCE[a/]; 1,1-DCE can be a chem. reaction product of TCA	◉	○	2
VC*		Daughter product of DCE[a/]	◉	○	2
1,1,1-Trichloroethane*		Material released	○	◉	0
DCA		Daughter product of TCA under reducing conditions	◉	○	2
Carbon Tetrachloride		Material released	○	◉	0
Chloroethane*		Daughter product of DCA or VC under reducing conditions	◉	○	2
Ethene/Ethane	>0.01 mg/L	Daughter product of VC/ethene	○	◉	0
	>0.1 mg/L	Daughter product of VC/ethene	○	◉	0
Chloroform		Daughter product of Carbon Tetrachloride	○	◉	0
Dichloromethane		Daughter product of Chloroform	○	◉	0

* required analysis

a/ Points awarded only if it can be shown that the compound is a daughter product (i.e., not a constituent of the source NAPL).

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End of Form

Golder Associates

DATE: 03/06/13

Project #: 0739612712

Prepared By:

Reviewed By:

Title:

MW-1 MNA SCREENING
Nature and Extent Study
Randolph County Landfill, Permit No. 76-01

Figure No. 1

Natural Attenuation Screening Protocol

The following is taken from the USEPA protocol (USEPA, 1998). The results of this scoring process have no regulatory significance.

Interpretation	Score
Inadequate evidence for anaerobic biodegradation* of chlorinated organics	0 to 5
Limited evidence for anaerobic biodegradation* of chlorinated organics	6 to 14
Adequate evidence for anaerobic biodegradation* of chlorinated organics	15 to 20
Strong evidence for anaerobic biodegradation* of chlorinated organics	>20

* reductive dechlorination

Score: 11

Scroll to End of Table

Analysis	Concentration in Most Contam. Zone	Interpretation	Yes	No	Points Awarded
Oxygen*	<0.5 mg/L	Tolerated, suppresses the reductive pathway at higher concentrations	○	◉	0
	> 5mg/L	Not tolerated; however, VC may be oxidized aerobically	○	◉	0
Nitrate*	<1 mg/L	At higher concentrations may compete with reductive pathway	◉	○	2
Iron II*	>1 mg/L	Reductive pathway possible; VC may be oxidized under Fe(III)-reducing conditions	○	◉	0
Sulfate*	<20 mg/L	At higher concentrations may compete with reductive pathway	◉	○	2
Sulfide*	>1 mg/L	Reductive pathway possible	○	◉	0
Methane*	>0.5 mg/L	Ultimate reductive daughter product, VC Accumulates	○	◉	0
Oxidation Reduction Potential* (ORP)	<50 millivolts (mV)	Reductive pathway possible	○	◉	0
	<-100mV	Reductive pathway likely	○	◉	0
pH*	5 < pH < 9	Optimal range for reductive pathway	○	◉	-2
TOC	>20 mg/L	Carbon and energy source; drives dechlorination; can be natural or anthropogenic	○	◉	0
Temperature*	>20°C	At T >20°C biochemical process is accelerated	○	◉	0
Carbon Dioxide	>2x background	Ultimate oxidative daughter product	◉	○	1
Alkalinity	>2x background	Results from interaction of carbon dioxide with aquifer minerals	○	◉	0
Chloride*	>2x background	Daughter product of organic chlorine	◉	○	2
Hydrogen	>1 nM	Reductive pathway possible, VC may accumulate	○	◉	0
Volatile Fatty Acids	>0.1 mg/L	Intermediates resulting from biodegradation of aromatic compounds; carbon and energy source	○	◉	0
BTEX*	>0.1 mg/L	Carbon and energy source; drives dechlorination	○	◉	0
PCE*		Material released	◉	○	0
TCE*		Daughter product of PCE [a/]	○	◉	0
DCE*		Daughter product of TCE. If cis is greater than 80% of total DCE it is likely a daughter product of TCE[a/]; 1,1-DCE can be a chem. reaction product of TCA	◉	○	2
VC*		Daughter product of DCE[a/]	○	◉	0
1,1,1-Trichloroethane*		Material released	○	◉	0
DCA		Daughter product of TCA under reducing conditions	◉	○	2
Carbon Tetrachloride		Material released	○	◉	0
Chloroethane*		Daughter product of DCA or VC under reducing conditions	◉	○	2
Ethene/Ethane	>0.01 mg/L	Daughter product of VC/ethene	○	◉	0
	>0.1 mg/L	Daughter product of VC/ethene	○	◉	0
Chloroform		Daughter product of Carbon Tetrachloride	○	◉	0
Dichloromethane		Daughter product of Chloroform	○	◉	0

* required analysis

a/ Points awarded only if it can be shown that the compound is a daughter product (i.e., not a constituent of the source NAPL).

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Golder Associates

DATE: 03/06/13

Project #: 0739612712

Prepared By:

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Title:

MW-2 MNA SCREENING
Nature and Extent Study
Randolph County Landfill, Permit No. 76-01

Figure No. 2

Natural Attenuation Screening Protocol

The following is taken from the USEPA protocol (USEPA, 1998). The results of this scoring process have no regulatory significance.

Interpretation	Score
Inadequate evidence for anaerobic biodegradation* of chlorinated organics	0 to 5
Limited evidence for anaerobic biodegradation* of chlorinated organics	6 to 14
Adequate evidence for anaerobic biodegradation* of chlorinated organics	15 to 20
Strong evidence for anaerobic biodegradation* of chlorinated organics	>20

* reductive dechlorination

Score: 5

Scroll to End of Table

Analysis	Concentration in Most Contam. Zone	Interpretation	Yes	No	Points Awarded
Oxygen*	<0.5 mg/L	Tolerated, suppresses the reductive pathway at higher concentrations	○	◉	0
	> 5mg/L	Not tolerated; however, VC may be oxidized aerobically	○	◉	0
Nitrate*	<1 mg/L	At higher concentrations may compete with reductive pathway	○	◉	0
Iron II*	>1 mg/L	Reductive pathway possible; VC may be oxidized under Fe(III)-reducing conditions	○	◉	0
Sulfate*	<20 mg/L	At higher concentrations may compete with reductive pathway	◉	○	2
Sulfide*	>1 mg/L	Reductive pathway possible	○	◉	0
Methane*	>0.5 mg/L	Ultimate reductive daughter product, VC Accumulates	○	◉	0
Oxidation Reduction Potential* (ORP)	<50 millivolts (mV)	Reductive pathway possible	○	◉	0
	<-100mV	Reductive pathway likely	○	◉	0
pH*	5 < pH < 9	Optimal range for reductive pathway	◉	○	0
TOC	>20 mg/L	Carbon and energy source; drives dechlorination; can be natural or anthropogenic	○	◉	0
Temperature*	>20°C	At T >20°C biochemical process is accelerated	○	◉	0
Carbon Dioxide	>2x background	Ultimate oxidative daughter product	○	◉	0
Alkalinity	>2x background	Results from interaction of carbon dioxide with aquifer minerals	○	◉	0
Chloride*	>2x background	Daughter product of organic chlorine	○	◉	0
Hydrogen	>1 nM	Reductive pathway possible, VC may accumulate	◉	○	3
Volatile Fatty Acids	>0.1 mg/L	Intermediates resulting from biodegradation of aromatic compounds; carbon and energy source	○	◉	0
BTEX*	>0.1 mg/L	Carbon and energy source; drives dechlorination	○	◉	0
PCE*		Material released	○	◉	0
TCE*		Daughter product of PCE [a/]	○	◉	0
DCE*		Daughter product of TCE. If cis is greater than 80% of total DCE it is likely a daughter product of TCE[a/]; 1,1-DCE can be a chem. reaction product of TCA	○	◉	0
VC*		Daughter product of DCE[a/]	○	◉	0
1,1,1-Trichloroethane*		Material released	○	◉	0
DCA		Daughter product of TCA under reducing conditions	○	◉	0
Carbon Tetrachloride		Material released	○	◉	0
Chloroethane*		Daughter product of DCA or VC under reducing conditions	○	◉	0
Ethene/Ethane	>0.01 mg/L	Daughter product of VC/ethene	○	◉	0
	>0.1 mg/L	Daughter product of VC/ethene	○	◉	0
Chloroform		Daughter product of Carbon Tetrachloride	○	◉	0
Dichloromethane		Daughter product of Chloroform	○	◉	0

* required analysis

a/ Points awarded only if it can be shown that the compound is a daughter product (i.e., not a constituent of the source NAPL).

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MW-6 MNA SCREENING
Nature and Extent Study
Randolph County Landfill, Permit No. 76-01

Figure No. 3

Natural Attenuation Screening Protocol

The following is taken from the USEPA protocol (USEPA, 1998). The results of this scoring process have no regulatory significance.

Interpretation	Score
Inadequate evidence for anaerobic biodegradation* of chlorinated organics	0 to 5
Limited evidence for anaerobic biodegradation* of chlorinated organics	6 to 14
Adequate evidence for anaerobic biodegradation* of chlorinated organics	15 to 20
Strong evidence for anaerobic biodegradation* of chlorinated organics	>20

* reductive dechlorination

Score: 14

Scroll to End of Table

Analysis	Concentration in Most Contam. Zone	Interpretation	Yes	No	Points Awarded
Oxygen*	<0.5 mg/L	Tolerated, suppresses the reductive pathway at higher concentrations	○	◉	0
	> 5 mg/L	Not tolerated; however, VC may be oxidized aerobically	○	◉	0
Nitrate*	<1 mg/L	At higher concentrations may compete with reductive pathway	○	◉	0
Iron II*	>1 mg/L	Reductive pathway possible; VC may be oxidized under Fe(III)-reducing conditions	○	◉	0
Sulfate*	<20 mg/L	At higher concentrations may compete with reductive pathway	◉	○	2
Sulfide*	>1 mg/L	Reductive pathway possible	○	◉	0
Methane*	>0.5 mg/L	Ultimate reductive daughter product, VC Accumulates	◉	○	3
Oxidation Reduction Potential* (ORP)	<50 millivolts (mV)	Reductive pathway possible	○	◉	0
	<-100mV	Reductive pathway likely	○	◉	0
pH*	5 < pH < 9	Optimal range for reductive pathway	○	◉	-2
TOC	>20 mg/L	Carbon and energy source; drives dechlorination; can be natural or anthropogenic	○	◉	0
Temperature*	>20°C	At T >20°C biochemical process is accelerated	○	◉	0
Carbon Dioxide	>2x background	Ultimate oxidative daughter product	◉	○	1
Alkalinity	>2x background	Results from interaction of carbon dioxide with aquifer minerals	○	◉	0
Chloride*	>2x background	Daughter product of organic chlorine	◉	○	2
Hydrogen	>1 nM	Reductive pathway possible, VC may accumulate	○	◉	0
Volatile Fatty Acids	>0.1 mg/L	Intermediates resulting from biodegradation of aromatic compounds; carbon and energy source	○	◉	0
BTEX*	>0.1 mg/L	Carbon and energy source; drives dechlorination	○	◉	0
PCE*		Material released	○	◉	0
TCE*		Daughter product of PCE [a/]	○	◉	0
DCE*		Daughter product of TCE. If cis is greater than 80% of total DCE it is likely a daughter product of TCE[a/]; 1,1-DCE can be a chem. reaction product of TCA	◉	○	2
VC*		Daughter product of DCE[a/]	◉	○	2
1,1,1-Trichloroethane*		Material released	○	◉	0
DCA		Daughter product of TCA under reducing conditions	◉	○	2
Carbon Tetrachloride		Material released	○	◉	0
Chloroethane*		Daughter product of DCA or VC under reducing conditions	○	◉	0
Ethene/Ethane	>0.01 mg/L	Daughter product of VC/ethene	○	◉	0
	>0.1 mg/L	Daughter product of VC/ethene	○	◉	0
Chloroform		Daughter product of Carbon Tetrachloride	○	◉	0
Dichloromethane		Daughter product of Chloroform	◉	○	2

* required analysis

a/ Points awarded only if it can be shown that the compound is a daughter product (i.e., not a constituent of the source NAPL).

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MW-7 MNA SCREENING
Nature and Extent Study
Randolph County Landfill, Permit No. 76-01

Figure No. 4

Natural Attenuation Screening Protocol

The following is taken from the USEPA protocol (USEPA, 1998). The results of this scoring process have no regulatory significance.

Interpretation	Score
Inadequate evidence for anaerobic biodegradation* of chlorinated organics	0 to 5
Limited evidence for anaerobic biodegradation* of chlorinated organics	6 to 14
Adequate evidence for anaerobic biodegradation* of chlorinated organics	15 to 20
Strong evidence for anaerobic biodegradation* of chlorinated organics	>20

* reductive dechlorination

Score: 11

Scroll to End of Table

Analysis	Concentration in Most Contam. Zone	Interpretation	Yes	No	Points Awarded
Oxygen*	<0.5 mg/L	Tolerated, suppresses the reductive pathway at higher concentrations	○	◉	0
	> 5mg/L	Not tolerated; however, VC may be oxidized aerobically	○	◉	0
Nitrate*	<1 mg/L	At higher concentrations may compete with reductive pathway	○	◉	0
Iron II*	>1 mg/L	Reductive pathway possible; VC may be oxidized under Fe(III)-reducing conditions	○	◉	0
Sulfate*	<20 mg/L	At higher concentrations may compete with reductive pathway	◉	○	2
Sulfide*	>1 mg/L	Reductive pathway possible	○	◉	0
Methane*	>0.5 mg/L	Ultimate reductive daughter product, VC Accumulates	◉	○	3
Oxidation Reduction Potential* (ORP)	<50 millivolts (mV)	Reductive pathway possible	○	◉	0
	<-100mV	Reductive pathway likely	○	◉	0
pH*	5 < pH < 9	Optimal range for reductive pathway	◉	○	0
TOC	>20 mg/L	Carbon and energy source; drives dechlorination; can be natural or anthropogenic	○	◉	0
Temperature*	>20°C	At T >20°C biochemical process is accelerated	○	◉	0
Carbon Dioxide	>2x background	Ultimate oxidative daughter product	○	◉	0
Alkalinity	>2x background	Results from interaction of carbon dioxide with aquifer minerals	○	◉	0
Chloride*	>2x background	Daughter product of organic chlorine	○	◉	0
Hydrogen	>1 nM	Reductive pathway possible, VC may accumulate	○	◉	0
Volatile Fatty Acids	>0.1 mg/L	Intermediates resulting from biodegradation of aromatic compounds; carbon and energy source	○	◉	0
BTEX*	>0.1 mg/L	Carbon and energy source; drives dechlorination	○	◉	0
PCE*		Material released	○	◉	0
TCE*		Daughter product of PCE [a/]	◉	○	2
DCE*		Daughter product of TCE. If cis is greater than 80% of total DCE it is likely a daughter product of TCE[a/], 1,1-DCE can be a chem. reaction product of TCA	◉	○	2
VC*		Daughter product of DCE[a/]	○	◉	0
1,1,1-Trichloroethane*		Material released	○	◉	0
DCA		Daughter product of TCA under reducing conditions	◉	○	2
Carbon Tetrachloride		Material released	○	◉	0
Chloroethane*		Daughter product of DCA or VC under reducing conditions	○	◉	0
Ethene/Ethane	>0.01 mg/L	Daughter product of VC/ethene	○	◉	0
	>0.1 mg/L	Daughter product of VC/ethene	○	◉	0
Chloroform		Daughter product of Carbon Tetrachloride	○	◉	0
Dichloromethane		Daughter product of Chloroform	○	◉	0

* required analysis

a/ Points awarded only if it can be shown that the compound is a daughter product (i.e., not a constituent of the source NAPL).

SCORE Reset

End of Form

Golder Associates

DATE: 03/06/13

Project #: 0739612712

Prepared By:

Reviewed By:

Title:

MW-8 MNA SCREENING
Nature and Extent Study
Randolph County Landfill, Permit No. 76-01

Figure No. 5

Natural Attenuation Screening Protocol

The following is taken from the USEPA protocol (USEPA, 1998). The results of this scoring process have no regulatory significance.

Interpretation	Score
Inadequate evidence for anaerobic biodegradation* of chlorinated organics	0 to 5
Limited evidence for anaerobic biodegradation* of chlorinated organics	6 to 14
Adequate evidence for anaerobic biodegradation* of chlorinated organics	15 to 20
Strong evidence for anaerobic biodegradation* of chlorinated organics	>20

* reductive dechlorination

Score: 12

Scroll to End of Table

Analysis	Concentration in Most Contam. Zone	Interpretation	Yes	No	Points Awarded
Oxygen*	<0.5 mg/L	Tolerated, suppresses the reductive pathway at higher concentrations	○	◉	0
	> 5mg/L	Not tolerated; however, VC may be oxidized aerobically	○	◉	0
Nitrate*	<1 mg/L	At higher concentrations may compete with reductive pathway	◉	○	2
Iron II*	>1 mg/L	Reductive pathway possible; VC may be oxidized under Fe(III)-reducing conditions	○	◉	0
Sulfate*	<20 mg/L	At higher concentrations may compete with reductive pathway	◉	○	2
Sulfide*	>1 mg/L	Reductive pathway possible	○	◉	0
Methane*	>0.5 mg/L	Ultimate reductive daughter product, VC Accumulates	○	◉	0
Oxidation Reduction Potential* (ORP)	<50 millivolts (mV)	Reductive pathway possible	○	◉	0
	<-100mV	Reductive pathway likely	○	◉	0
pH*	5 < pH < 9	Optimal range for reductive pathway	◉	○	0
TOC	>20 mg/L	Carbon and energy source; drives dechlorination; can be natural or anthropogenic	○	◉	0
Temperature*	>20°C	At T >20°C biochemical process is accelerated	○	◉	0
Carbon Dioxide	>2x background	Ultimate oxidative daughter product	◉	○	1
Alkalinity	>2x background	Results from interaction of carbon dioxide with aquifer minerals	○	◉	0
Chloride*	>2x background	Daughter product of organic chlorine	○	◉	0
Hydrogen	>1 nM	Reductive pathway possible, VC may accumulate	◉	○	3
Volatile Fatty Acids	>0.1 mg/L	Intermediates resulting from biodegradation of aromatic compounds; carbon and energy source	○	◉	0
BTEX*	>0.1 mg/L	Carbon and energy source; drives dechlorination	○	◉	0
PCE*		Material released	○	◉	0
TCE*		Daughter product of PCE [a/]	○	◉	0
DCE*		Daughter product of TCE. If cis is greater than 80% of total DCE it is likely a daughter product of TCE[a/]; 1,1-DCE can be a chem. reaction product of TCA	◉	○	2
VC*		Daughter product of DCE[a/]	○	◉	0
1,1,1-Trichloroethane*		Material released	○	◉	0
DCA		Daughter product of TCA under reducing conditions	◉	○	2
Carbon Tetrachloride		Material released	○	◉	0
Chloroethane*		Daughter product of DCA or VC under reducing conditions	○	◉	0
Ethene/Ethane	>0.01 mg/L	Daughter product of VC/ethene	○	◉	0
	>0.1 mg/L	Daughter product of VC/ethene	○	◉	0
Chloroform		Daughter product of Carbon Tetrachloride	○	◉	0
Dichloromethane		Daughter product of Chloroform	○	◉	0

* required analysis

a/ Points awarded only if it can be shown that the compound is a daughter product (i.e., not a constituent of the source NAPL).

SCORE Reset

End of Form

Golder Associates	DATE: 03/06/13 Project #: 0739612712 Prepared By: Reviewed By:	**Title:** **MW-9 MNA SCREENING** **Nature and Extent Study** **Randolph County Landfill, Permit No. 76-01**	**Figure No. 6**

Natural Attenuation Screening Protocol

The following is taken from the USEPA protocol (USEPA, 1998). The results of this scoring process have no regulatory significance.

Interpretation	Score
Inadequate evidence for anaerobic biodegradation* of chlorinated organics	0 to 5
Limited evidence for anaerobic biodegradation* of chlorinated organics	6 to 14
Adequate evidence for anaerobic biodegradation* of chlorinated organics	15 to 20
Strong evidence for anaerobic biodegradation* of chlorinated organics	>20

* reductive dechlorination

Score: 19

Scroll to End of Table

Analysis	Concentration in Most Contam. Zone	Interpretation	Yes	No	Points Awarded
Oxygen*	<0.5 mg/L	Tolerated, suppresses the reductive pathway at higher concentrations	○	◉	0
	> 5mg/L	Not tolerated; however, VC may be oxidized aerobically	○	◉	0
Nitrate*	<1 mg/L	At higher concentrations may compete with reductive pathway	◉	○	2
Iron II*	>1 mg/L	Reductive pathway possible; VC may be oxidized under Fe(III)-reducing conditions	○	◉	0
Sulfate*	<20 mg/L	At higher concentrations may compete with reductive pathway	◉	○	2
Sulfide*	>1 mg/L	Reductive pathway possible	○	◉	0
Methane*	>0.5 mg/L	Ultimate reductive daughter product, VC Accumulates	○	◉	0
Oxidation Reduction Potential* (ORP)	<50 millivolts (mV)	Reductive pathway possible	○	◉	0
	<-100mV	Reductive pathway likely	○	◉	0
pH*	5 < pH < 9	Optimal range for reductive pathway	◉	○	0
TOC	>20 mg/L	Carbon and energy source; drives dechlorination; can be natural or anthropogenic	○	◉	0
Temperature*	>20°C	At T >20°C biochemical process is accelerated	○	◉	0
Carbon Dioxide	>2x background	Ultimate oxidative daughter product	○	◉	0
Alkalinity	>2x background	Results from interaction of carbon dioxide with aquifer minerals	○	◉	0
Chloride*	>2x background	Daughter product of organic chlorine	◉	○	2
Hydrogen	>1 nM	Reductive pathway possible, VC may accumulate	◉	○	3
Volatile Fatty Acids	>0.1 mg/L	Intermediates resulting from biodegradation of aromatic compounds; carbon and energy source	○	◉	0
BTEX*	>0.1 mg/L	Carbon and energy source; drives dechlorination	○	◉	0
PCE*		Material released	◉	○	0
TCE*		Daughter product of PCE [a/]	◉	○	2
DCE*		Daughter product of TCE. If cis is greater than 80% of total DCE it is likely a daughter product of TCE[a/], 1,1-DCE can be a chem. reaction product of TCA	◉	○	2
VC*		Daughter product of DCE[a/]	○	◉	0
1,1,1-Trichloroethane*		Material released	○	◉	0
DCA		Daughter product of TCA under reducing conditions	◉	○	2
Carbon Tetrachloride		Material released	○	◉	0
Chloroethane*		Daughter product of DCA or VC under reducing conditions	◉	○	2
Ethene/Ethane	>0.01 mg/L	Daughter product of VC/ethene	○	◉	0
	>0.1 mg/L	Daughter product of VC/ethene	○	◉	0
Chloroform		Daughter product of Carbon Tetrachloride	○	◉	0
Dichloromethane		Daughter product of Chloroform	◉	○	2

* required analysis

a/ Points awarded only if it can be shown that the compound is a daughter product (i.e., not a constituent of the source NAPL).

SCORE Reset

End of Form

Golder Associates	DATE: 03/06/13 Project #: 0739612712 Prepared By: Reviewed By:	**Title:** **MW-10S MNA SCREENING** **Nature and Extent Study** **Randolph County Landfill, Permit No. 76-01**	**Figure No. 7**

Natural Attenuation Screening Protocol

The following is taken from the USEPA protocol (USEPA, 1998). The results of this scoring process have no regulatory significance.

Interpretation	Score
Inadequate evidence for anaerobic biodegradation* of chlorinated organics	0 to 5
Limited evidence for anaerobic biodegradation* of chlorinated organics	6 to 14
Adequate evidence for anaerobic biodegradation* of chlorinated organics	15 to 20
Strong evidence for anaerobic biodegradation* of chlorinated organics	>20

Score: 15

Scroll to End of Table

* reductive dechlorination

Analysis	Concentration in Most Contam. Zone	Interpretation	Yes	No	Points Awarded
Oxygen*	<0.5 mg/L	Tolerated, suppresses the reductive pathway at higher concentrations	○	◉	0
	> 5mg/L	Not tolerated; however, VC may be oxidized aerobically	○	◉	0
Nitrate*	<1 mg/L	At higher concentrations may compete with reductive pathway	◉	○	2
Iron II*	>1 mg/L	Reductive pathway possible; VC may be oxidized under Fe(III)-reducing conditions	○	◉	0
Sulfate*	<20 mg/L	At higher concentrations may compete with reductive pathway	○	◉	0
Sulfide*	>1 mg/L	Reductive pathway possible	○	◉	0
Methane*	>0.5 mg/L	Ultimate reductive daughter product, VC Accumulates	○	◉	0
Oxidation Reduction Potential* (ORP)	<50 millivolts (mV)	Reductive pathway possible	○	◉	0
	<-100mV	Reductive pathway likely	○	◉	0
pH*	5 < pH < 9	Optimal range for reductive pathway	◉	○	0
TOC	>20 mg/L	Carbon and energy source; drives dechlorination; can be natural or anthropogenic	○	◉	0
Temperature*	>20°C	At T >20°C biochemical process is accelerated	○	◉	0
Carbon Dioxide	>2x background	Ultimate oxidative daughter product	○	◉	0
Alkalinity	>2x background	Results from interaction of carbon dioxide with aquifer minerals	○	◉	0
Chloride*	>2x background	Daughter product of organic chlorine	◉	○	2
Hydrogen	>1 nM	Reductive pathway possible, VC may accumulate	◉	○	3
Volatile Fatty Acids	>0.1 mg/L	Intermediates resulting from biodegradation of aromatic compounds; carbon and energy source	○	◉	0
BTEX*	>0.1 mg/L	Carbon and energy source; drives dechlorination	○	◉	0
PCE*		Material released	○	◉	0
TCE*		Daughter product of PCE [a/]	○	◉	0
DCE*		Daughter product of TCE. If cis is greater than 80% of total DCE it is likely a daughter product of TCE[a/], 1,1-DCE can be a chem. reaction product of TCA	◉	○	2
VC*		Daughter product of DCE[a/]	◉	○	2
1,1,1-Trichloroethane*		Material released	○	◉	0
DCA		Daughter product of TCA under reducing conditions	◉	○	2
Carbon Tetrachloride		Material released	○	◉	0
Chloroethane*		Daughter product of DCA or VC under reducing conditions	◉	○	2
Ethene/Ethane	>0.01 mg/L	Daughter product of VC/ethene	○	◉	0
	>0.1 mg/L	Daughter product of VC/ethene	○	◉	0
Chloroform		Daughter product of Carbon Tetrachloride	○	◉	0
Dichloromethane		Daughter product of Chloroform	○	◉	0

* required analysis

a/ Points awarded only if it can be shown that the compound is a daughter product (i.e., not a constituent of the source NAPL).

SCORE Reset

End of Form

Golder Associates

DATE: 03/06/13

Project #: 0739612712

Prepared By:

Reviewed By:

Title:

MW-10D MNA SCREENING
Nature and Extent Study
Randolph County Landfill, Permit No. 76-01

Figure No. 8

Natural Attenuation Screening Protocol

The following is taken from the USEPA protocol (USEPA, 1998). The results of this scoring process have no regulatory significance.

Interpretation	Score
Inadequate evidence for anaerobic biodegradation* of chlorinated organics	0 to 5
Limited evidence for anaerobic biodegradation* of chlorinated organics	6 to 14
Adequate evidence for anaerobic biodegradation* of chlorinated organics	15 to 20
Strong evidence for anaerobic biodegradation* of chlorinated organics	>20

* reductive dechlorination

Score: 4

Scroll to End of Table

Analysis	Concentration in Most Contam. Zone	Interpretation	Yes	No	Points Awarded
Oxygen*	<0.5 mg/L	Tolerated, suppresses the reductive pathway at higher concentrations	○	◉	0
	> 5mg/L	Not tolerated; however, VC may be oxidized aerobically	○	◉	0
Nitrate*	<1 mg/L	At higher concentrations may compete with reductive pathway	◉	○	2
Iron II*	>1 mg/L	Reductive pathway possible; VC may be oxidized under Fe(III)-reducing conditions	○	◉	0
Sulfate*	<20 mg/L	At higher concentrations may compete with reductive pathway	◉	○	2
Sulfide*	>1 mg/L	Reductive pathway possible	○	◉	0
Methane*	>0.5 mg/L	Ultimate reductive daughter product, VC Accumulates	○	◉	0
Oxidation Reduction Potential* (ORP)	<50 millivolts (mV)	Reductive pathway possible	○	◉	0
	<-100mV	Reductive pathway likely	○	◉	0
pH*	5 < pH < 9	Optimal range for reductive pathway	◉	○	0
TOC	>20 mg/L	Carbon and energy source; drives dechlorination; can be natural or anthropogenic	○	◉	0
Temperature*	>20°C	At T >20°C biochemical process is accelerated	○	◉	0
Carbon Dioxide	>2x background	Ultimate oxidative daughter product	○	◉	0
Alkalinity	>2x background	Results from interaction of carbon dioxide with aquifer minerals	○	◉	0
Chloride*	>2x background	Daughter product of organic chlorine	○	◉	0
Hydrogen	>1 nM	Reductive pathway possible, VC may accumulate	○	◉	0
Volatile Fatty Acids	>0.1 mg/L	Intermediates resulting from biodegradation of aromatic compounds; carbon and energy source	○	◉	0
BTEX*	>0.1 mg/L	Carbon and energy source; drives dechlorination	○	◉	0
PCE*		Material released	○	◉	0
TCE*		Daughter product of PCE [a/]	○	◉	0
DCE*		Daughter product of TCE. If cis is greater than 80% of total DCE it is likely a daughter product of TCE[a/]. 1,1-DCE can be a chem. reaction product of TCA	○	◉	0
VC*		Daughter product of DCE[a/]	○	◉	0
1,1,1-Trichloroethane*		Material released	○	◉	0
DCA		Daughter product of TCA under reducing conditions	○	◉	0
Carbon Tetrachloride		Material released	○	◉	0
Chloroethane*		Daughter product of DCA or VC under reducing conditions	○	◉	0
Ethene/Ethane	>0.01 mg/L	Daughter product of VC/ethene	○	◉	0
	>0.1 mg/L	Daughter product of VC/ethene	○	◉	0
Chloroform		Daughter product of Carbon Tetrachloride	○	◉	0
Dichloromethane		Daughter product of Chloroform	○	◉	0

* required analysis

a/ Points awarded only if it can be shown that the compound is a daughter product (i.e., not a constituent of the source NAPL).

SCORE Reset

End of Form

Golder Associates

DATE: 03/06/13

Project #: 0739612712

Prepared By:

Reviewed By:

Title:

MW-11S MNA SCREENING
Nature and Extent Study
Randolph County Landfill, Permit No. 76-01

Figure No. 9

Natural Attenuation Screening Protocol

The following is taken from the USEPA protocol (USEPA, 1998). The results of this scoring process have no regulatory significance.

Interpretation	Score
Inadequate evidence for anaerobic biodegradation* of chlorinated organics	0 to 5
Limited evidence for anaerobic biodegradation* of chlorinated organics	6 to 14
Adequate evidence for anaerobic biodegradation* of chlorinated organics	15 to 20
Strong evidence for anaerobic biodegradation* of chlorinated organics	>20

* reductive dechlorination

Score: 7

Scroll to End of Table

Analysis	Concentration in Most Contam. Zone	Interpretation	Yes	No	Points Awarded
Oxygen*	<0.5 mg/L	Tolerated, suppresses the reductive pathway at higher concentrations	○	◉	0
	> 5mg/L	Not tolerated; however, VC may be oxidized aerobically	○	◉	0
Nitrate*	<1 mg/L	At higher concentrations may compete with reductive pathway	◉	○	2
Iron II*	>1 mg/L	Reductive pathway possible; VC may be oxidized under Fe(III)-reducing conditions	○	◉	0
Sulfate*	<20 mg/L	At higher concentrations may compete with reductive pathway	◉	○	2
Sulfide*	>1 mg/L	Reductive pathway possible	○	◉	0
Methane*	>0.5 mg/L	Ultimate reductive daughter product, VC Accumulates	○	◉	0
Oxidation Reduction Potential* (ORP)	<50 millivolts (mV)	Reductive pathway possible	○	◉	0
	<-100mV	Reductive pathway likely	○	◉	0
pH*	5 < pH < 9	Optimal range for reductive pathway	◉	○	0
TOC	>20 mg/L	Carbon and energy source; drives dechlorination; can be natural or anthropogenic	○	◉	0
Temperature*	>20°C	At T >20°C biochemical process is accelerated	○	◉	0
Carbon Dioxide	>2x background	Ultimate oxidative daughter product	○	◉	0
Alkalinity	>2x background	Results from interaction of carbon dioxide with aquifer minerals	○	◉	0
Chloride*	>2x background	Daughter product of organic chlorine	○	◉	0
Hydrogen	>1 nM	Reductive pathway possible, VC may accumulate	◉	○	3
Volatile Fatty Acids	>0.1 mg/L	Intermediates resulting from biodegradation of aromatic compounds; carbon and energy source	○	◉	0
BTEX*	>0.1 mg/L	Carbon and energy source; drives dechlorination	○	◉	0
PCE*		Material released	○	◉	0
TCE*		Daughter product of PCE [a/]	○	◉	0
DCE*		Daughter product of TCE. If cis is greater than 80% of total DCE it is likely a daughter product of TCE[a/], 1,1-DCE can be a chem. reaction product of TCA	○	◉	0
VC*		Daughter product of DCE[a/]	○	◉	0
1,1,1-Trichloroethane*		Material released	○	◉	0
DCA		Daughter product of TCA under reducing conditions	○	◉	0
Carbon Tetrachloride		Material released	○	◉	0
Chloroethane*		Daughter product of DCA or VC under reducing conditions	○	◉	0
Ethene/Ethane	>0.01 mg/L	Daughter product of VC/ethene	○	◉	0
	>0.1 mg/L	Daughter product of VC/ethene	○	◉	0
Chloroform		Daughter product of Carbon Tetrachloride	○	◉	0
Dichloromethane		Daughter product of Chloroform	○	◉	0

* required analysis

a/ Points awarded only if it can be shown that the compound is a daughter product (i.e., not a constituent of the source NAPL).

SCORE Reset

End of Form

Golder Associates

DATE: 03/06/13

Project #: 0739612712

Prepared By:

Reviewed By:

Title:

MW-11D MNA SCREENING
Nature and Extent Study
Randolph County Landfill, Permit No. 76-01

Figure No. 10

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

Randolph County Landfill
Run Name

Data Input Instructions:
115 → 1. Enter value directly....or
or
0.02 → 2. Calculate by filling in gray cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	114.2	(ft/yr)
or			
Hydraulic Conductivity	K	2.8E-04	(cm/sec)
Hydraulic Gradient	i	0.0602	(ft/ft)
Effective Porosity	n	0.15	(-)

2. DISPERSION

Alpha x*	47.5	(ft)
(Alpha y) / (Alpha x)*	0.1	(-)
(Alpha z) / (Alpha x)*	5.E-02	(-)

Calc.

3. ADSORPTION

Retardation Factor* → R
or

Soil Bulk Density, rho	1.7	(kg/L)		
FractionOrganicCarbon, foc	1.0E-4	(-)		
Partition Coefficient	Koc			
PCE	426	(L/kg)	1.48	(-)
TCE	130	(L/kg)	1.15	(-)
DCE	125	(L/kg)	1.14	(-)
VC	30	(L/kg)	1.03	(-)
ETH	302	(L/kg)	1.34	(-)
Common R (used in model)* =			**1.15**	

4. BIOTRANSFORMATION -1st Order Decay Coefficient*

	λ (1/yr)	half-life (yrs)	Yield
Zone 1			
PCE → TCE	4.000	5.00	0.79
TCE → DCE	10.000	7.00	0.74
DCE → VC	3.900	1.50	0.64
VC → ETH	5.800	3.00	0.45
Zone 2	λ (1/yr)	half-life (yrs)	
PCE → TCE	0.139	5.00	
TCE → DCE	0.099	7.00	
DCE → VC	0.462	1.50	
VC → ETH	0.231	3.00	

λ HELP

5. GENERAL

Simulation Time*	30	(yr)
Modeled Area Width*	120	(ft)
Modeled Area Length*	1500	(ft)
Zone 1 Length*	1500	(ft)
Zone 2 Length*	0	(ft)

L, W

Zone 2= L - Zone 1

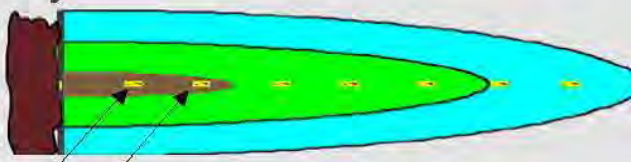
6. SOURCE DATA TYPE: Continuous Single Planar

Source Options

Source Thickness in Sat. Zone* 100 (ft)

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations

	Y1	k_s*
Width* (ft)	120	
Conc. (mg/L)*	C1	(1/yr)
PCE	.146	0
TCE	.068	0
DCE	.144	0
VC	.024	0
ETH	0	0



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)	.0	.0	.003	.0							
TCE Conc. (mg/L)	.0	.0	.002	.0							
DCE Conc. (mg/L)	.046	.004	.003	.0							
VC Conc. (mg/L)	.009	.001	.0	.0							
ETH Conc. (mg/L)	0.0	0.0	0.0	0.0							
Distance from Source (ft)	40	160	170	760							
Date Data Collected	2011										

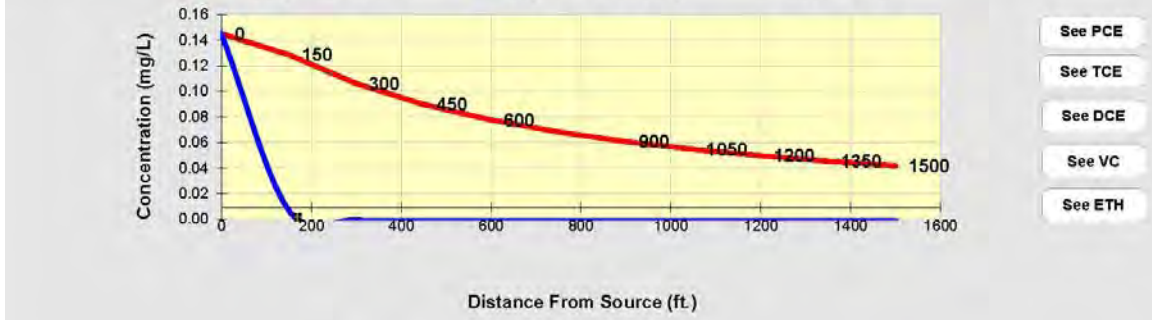
8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | RUN ARRAY | Help | Restore | RESE | SEE | Paste

Golder Associates	DATE: 03/08/13 Project# 0739612712 Prepared By: Reviewed By:	**Title:** *BIOCHLOR DATA ENTRY SHEET FOR WELLS MW-1, MW-10D, MW-10S, AND SW-2 Randolph County Landfill Permit No. 76-01*	**Figure No. 11**

DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

PCE	Distance from Source (ft)										
	0	150	300	450	600	750	900	1050	1200	1350	1500
No Degradation	0.146	0.130	0.107	0.091	0.079	0.069	0.062	0.056	0.051	0.046	0.043
Biotransformation	0.1460	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Monitoring Well Locations (ft)										
	40	160	170	760							
Field Data from Site	0.000	0.000	0.003	0.000							



See PCE | See TCE | See DCE | See VC | See ETH

Prepare Animation

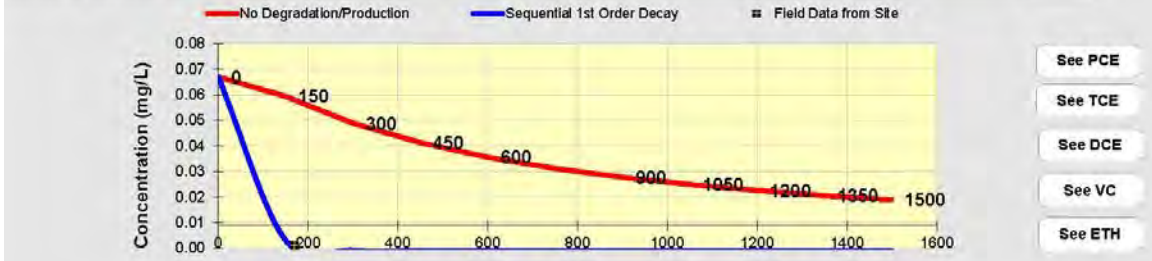
Time: 30.0 Years

Log ⟺ Linear

Return to Input | To All | To Array

DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

TCE	Distance from Source (ft)										
	0	150	300	450	600	750	900	1050	1200	1350	1500
No Degradation	0.068	0.060	0.050	0.042	0.037	0.032	0.029	0.026	0.024	0.022	0.020
Biotransformation	0.0680	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Monitoring Well Locations (ft)										
	40	160	170	760							
Field Data from Site	0.000	0.000	0.002	0.000							



See PCE | See TCE | See DCE | See VC | See ETH

Prepare Animation

Time: 30.0 Years

Log ⟺ Linear

Return to Input | To All | To Array

DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

DCE	Distance from Source (ft)										
	0	150	300	450	600	750	900	1050	1200	1350	1500
No Degradation	0.144	0.127	0.105	0.089	0.077	0.068	0.061	0.055	0.050	0.046	0.042
Biotransformation	0.1436	0.023	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Monitoring Well Locations (ft)										
	40	160	170	760							
Field Data from Site	0.046	0.004	0.003	0.000							

See PCE | See TCE | See DCE | See VC | See ETH

Prepare Animation

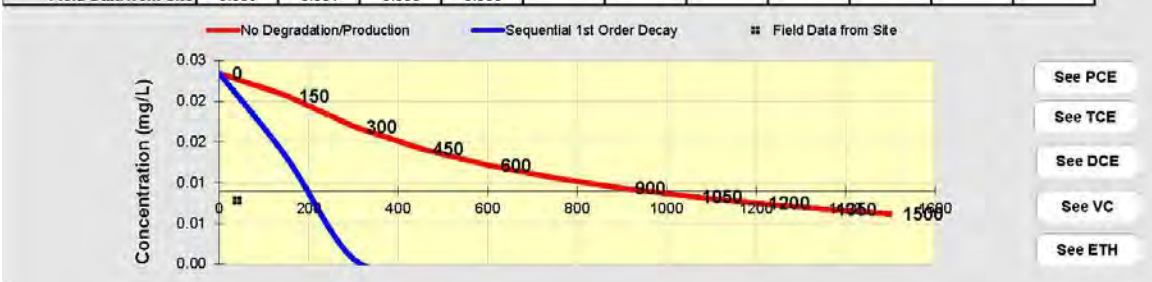
Time: 30.0 Years

Log ⟺ Linear

Return to Input | To All | To Array

DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

VC	Distance from Source (ft)										
	0	150	300	450	600	750	900	1050	1200	1350	1500
No Degradation	0.024	0.022	0.018	0.015	0.013	0.012	0.010	0.009	0.008	0.008	0.007
Biotransformation	0.0244	0.014	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Monitoring Well Locations (ft)										
	40	160	170	760							
Field Data from Site	0.009	0.001	0.000	0.000							



See PCE | See TCE | See DCE | See VC | See ETH

Prepare Animation

Time: 30.0 Years

Log ⟺ Linear

Return to Input | To All | To Array

Golder Associates	DATE: 03/08/13	Title: BIOCHLOR MODEL FOR WELLS MW-1, MW-10D, MW-10S, AND SW-2 Randolph County Landfill Permit No. 76-01	Figure No. 12
	Project# 0739612712		
	Prepared By:		
	Reviewed By:		

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

Randolph County
Landfill
Run Name

Data Input Instructions:
115 → 1. Enter value directly....or
or 2. Calculate by filling in gray
0.02 cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	114.2	(ft/yr)
or			
Hydraulic Conductivity	K	2.8E-04	(cm/sec)
Hydraulic Gradient	i	0.0602	(ft/ft)
Effective Porosity	n	0.15	(-)

2. DISPERSION

Alpha x*	47.5	(ft)
(Alpha y) / (Alpha x)*	0.1	(-)
(Alpha z) / (Alpha x)*	5.E-02	(-)

Calc.

3. ADSORPTION

Retardation Factor* → R
or

Soil Bulk Density, rho	1.7	(kg/L)		
FractionOrganicCarbon, foc	1.0E-4	(-)		
Partition Coefficient	Koc			
PCE	426	(L/kg)	1.48	(-)
TCE	130	(L/kg)	1.15	(-)
DCE	125	(L/kg)	1.14	(-)
VC	30	(L/kg)	1.03	(-)
ETH	302	(L/kg)	1.34	(-)
Common R (used in model)* =			**1.15**	

4. BIOTRANSFORMATION -1st Order Decay Coefficient*

Zone 1	λ (1/yr)	half-life (yrs)	Yield
PCE → TCE	4.000	5.00	0.79
TCE → DCE	10.000	7.00	0.74
DCE → VC	3.900	1.50	0.64
VC → ETH	5.800	3.00	0.45

Zone 2	λ (1/yr)	half-life (yrs)
PCE → TCE	0.139	5.00
TCE → DCE	0.099	7.00
DCE → VC	0.462	1.50
VC → ETH	0.231	3.00

λ HELP

5. GENERAL

Simulation Time*	30	(yr)
Modeled Area Width*	250	(ft)
Modeled Area Length*	600	(ft)
Zone 1 Length*	600	(ft)
Zone 2 Length*	0	(ft)

L, W

Zone 2= L - Zone 1

6. SOURCE DATA TYPE: Continuous Single Planar

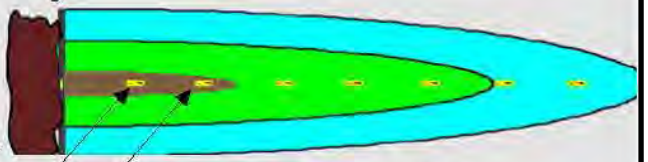
Source Options

Source Thickness in Sat. Zone* 100 (ft)

Width* (ft) Y1: 250

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	.146	0
TCE	.068	0
DCE	.144	0
VC	.024	0
ETH	0	0

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)	.0	.001	.0	.0								
TCE Conc. (mg/L)	.0	.0	.0	.0								
DCE Conc. (mg/L)	.001	.0	.0	.0								
VC Conc. (mg/L)	.001	.0	.0	.0								
ETH Conc. (mg/L)	0.0	0.0	0.0	0.0								
Distance from Source (ft)	120	170	260	270								
Date Data Collected	2011											

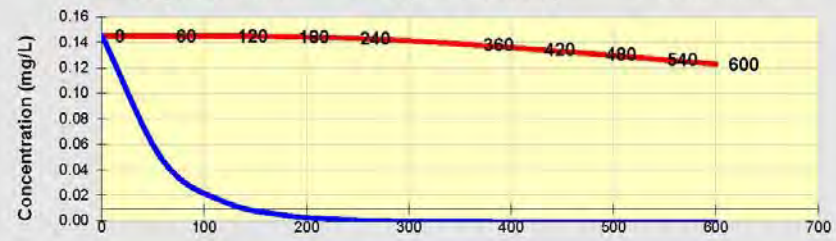
8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | RUN ARRAY | Help | Restore | RESE | SEE | Paste

Golder Associates	DATE: 03/08/13 Project# 0739612712 Prepared By: Reviewed By:	**Title:** *BIOCHLOR DATA ENTRY SHEET FOR WELLS MW-7, MW-2, MW-11S, AND MW-11D Randolph County Landfill Permit No. 76-01*	**Figure No. 13**

DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

PCE	Distance from Source (ft)										
	0	60	120	180	240	300	360	420	480	540	600
No Degradation	0.146	0.146	0.146	0.146	0.144	0.142	0.139	0.136	0.132	0.128	0.124
Biotransformation	0.1460	0.048	0.016	0.005	0.002	0.001	0.000	0.000	0.000	0.000	0.000
	Monitoring Well Locations (ft)										
	120	170	260	270							
Field Data from Site	0.000	0.001	0.000	0.000							



See PCE | See TCE | See DCE | See VC | See ETH

Time: 30.0 Years (Log ⟺ Linear)

Prepare Animation | Return to Input | To All | To Array

DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

TCE	Distance from Source (ft)										
	0	60	120	180	240	300	360	420	480	540	600
No Degradation	0.068	0.068	0.068	0.068	0.067	0.066	0.065	0.063	0.061	0.059	0.058
Biotransformation	0.0680	0.024	0.008	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000
	Monitoring Well Locations (ft)										
	120	170	260	270							
Field Data from Site	0.000	0.000	0.000	0.000							

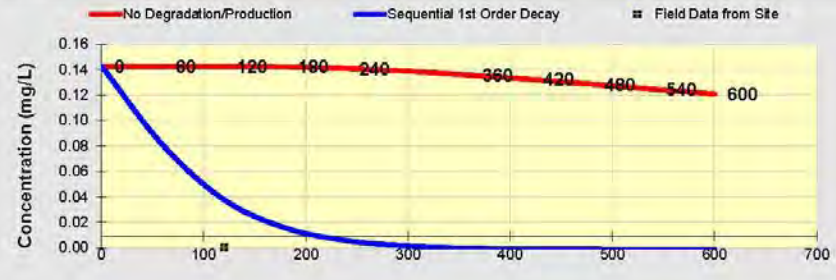
See PCE | See TCE | See DCE | See VC | See ETH

Time: 30.0 Years (Log ⟺ Linear)

Prepare Animation | Return to Input | To All | To Array

DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

DCE	Distance from Source (ft)										
	0	60	120	180	240	300	360	420	480	540	600
No Degradation	0.144	0.144	0.144	0.143	0.142	0.140	0.137	0.133	0.130	0.126	0.122
Biotransformation	0.1436	0.082	0.039	0.017	0.007	0.003	0.001	0.000	0.000	0.000	0.000
	Monitoring Well Locations (ft)										
	120	170	260	270							
Field Data from Site	0.001	0.000	0.000	0.000							



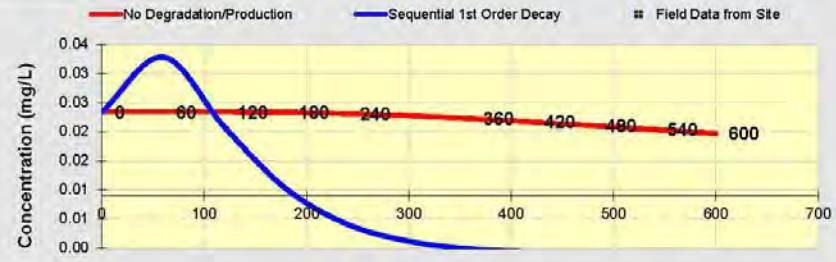
See PCE | See TCE | See DCE | See VC | See ETH

Time: 30.0 Years (Log ⟺ Linear)

Prepare Animation | Return to Input | To All | To Array

DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

VC	Distance from Source (ft)										
	0	60	120	180	240	300	360	420	480	540	600
No Degradation	0.024	0.024	0.024	0.024	0.024	0.024	0.023	0.023	0.022	0.021	0.021
Biotransformation	0.0244	0.034	0.022	0.011	0.005	0.002	0.001	0.000	0.000	0.000	0.000
	Monitoring Well Locations (ft)										
	120	170	260	270							
Field Data from Site	0.001	0.000	0.000	0.000							

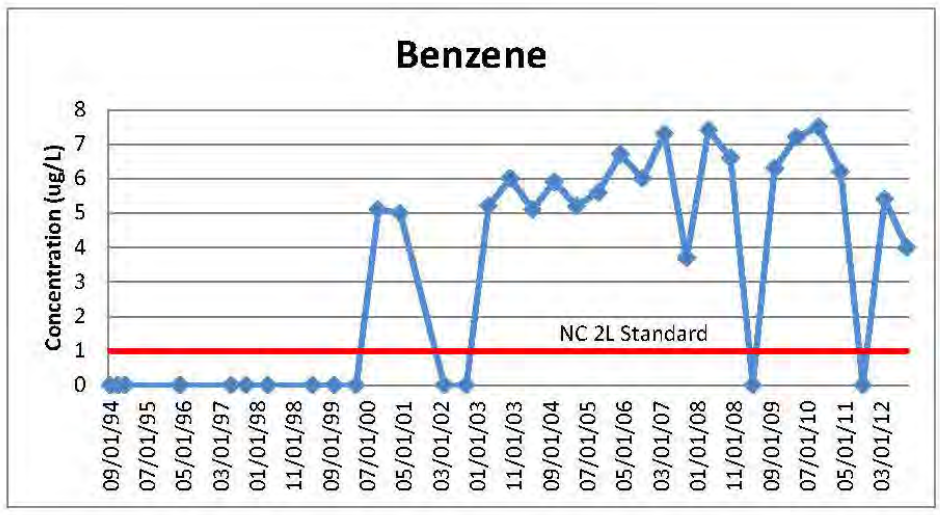


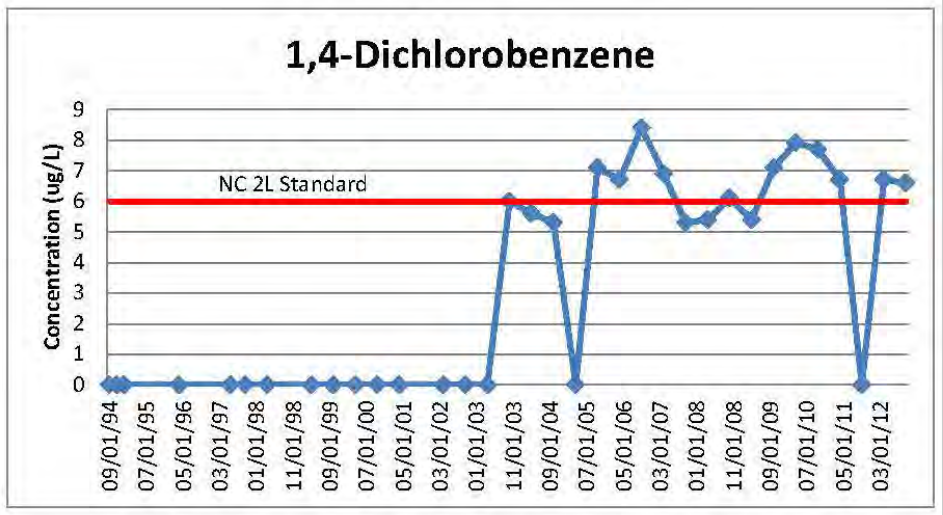
See PCE | See TCE | See DCE | See VC | See ETH

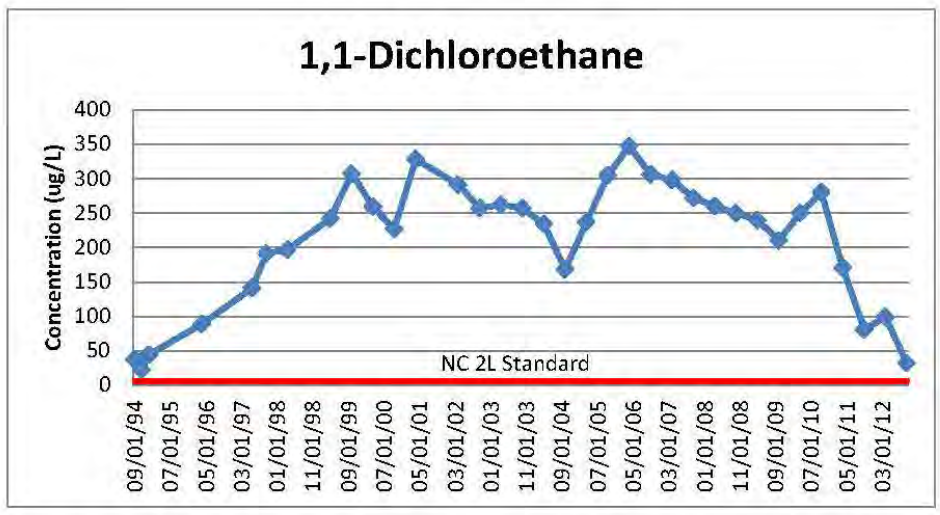
Time: 30.0 Years (Log ⟺ Linear)

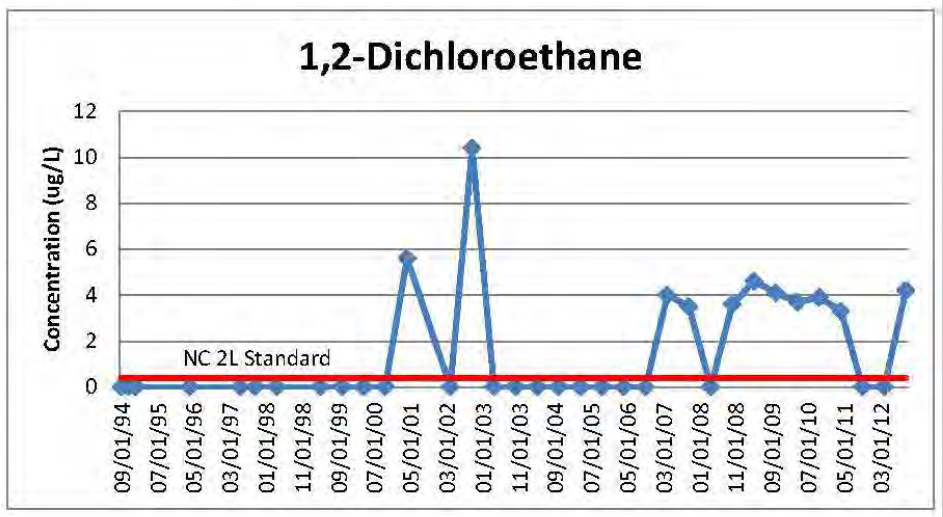
Prepare Animation | Return to Input | To All | To Array

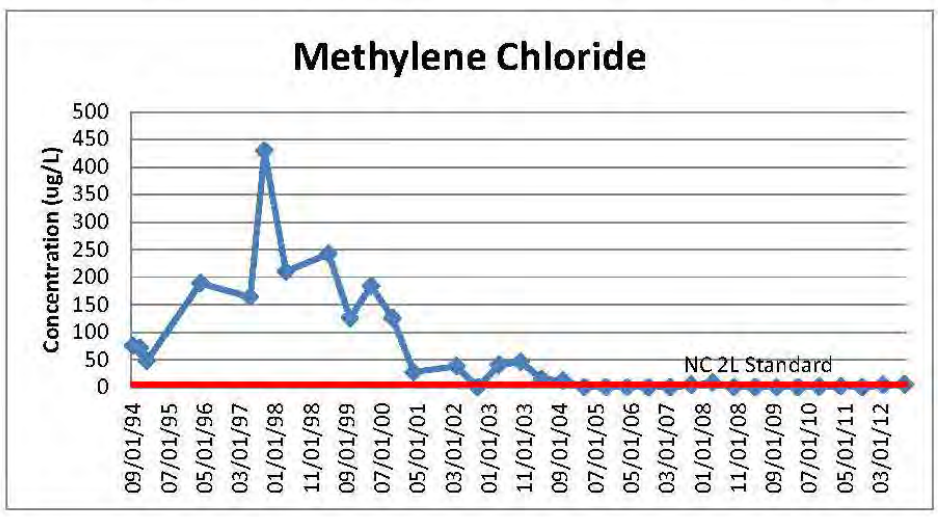
Golder Associates	DATE: 03/08/13 Project# 0739612712 Prepared By: Reviewed By:	Title: **BIOCHLOR MODEL FOR WELLS MW-1, MW-7, MW-2, MW-11S, AND MW-11D Randolph County Landfill Permit No. 76-01**	Figure No. **14**

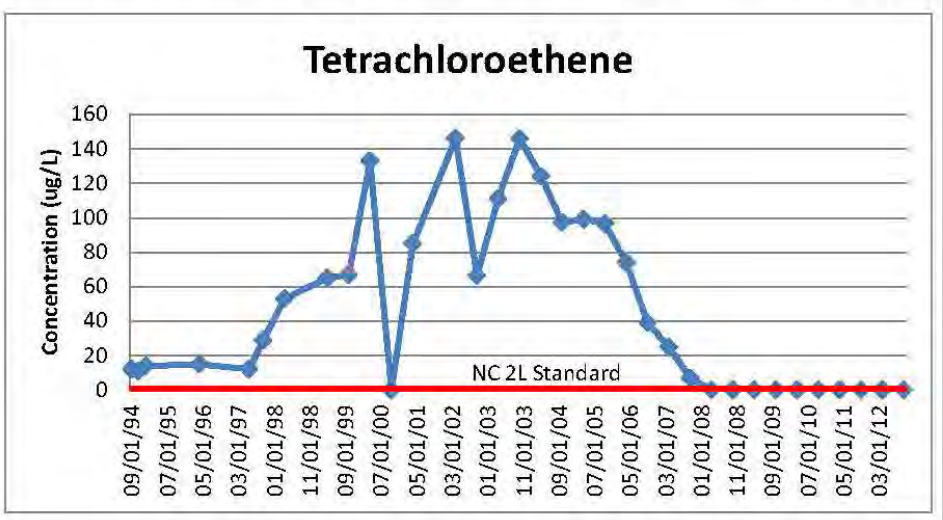


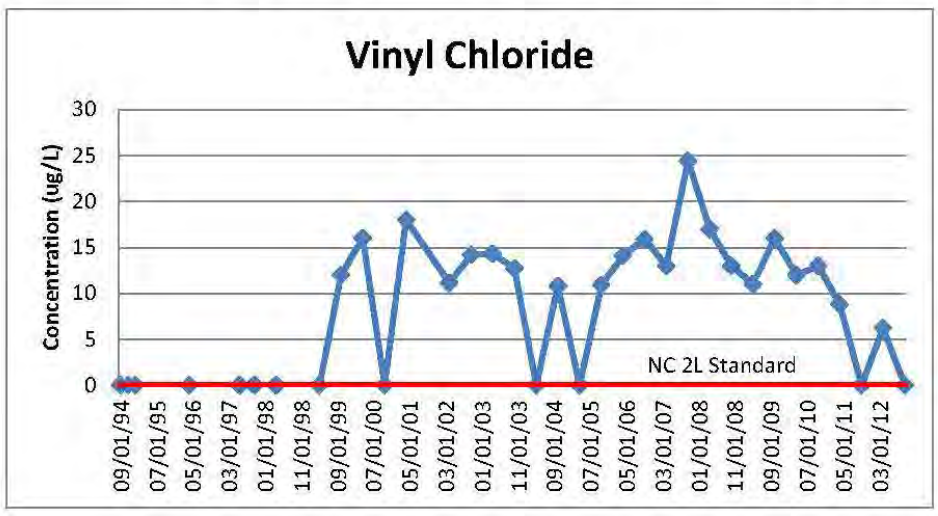




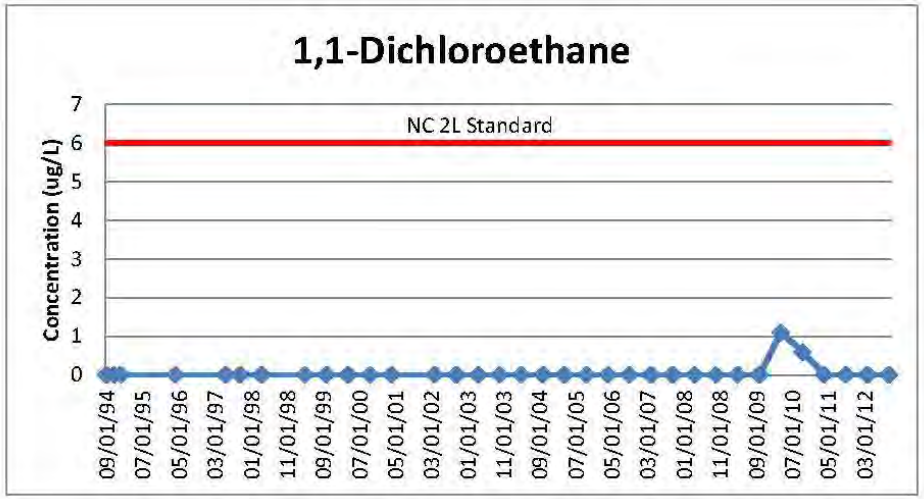








Golder Associates	DATE: 03/15/13 Project# 0739612712 Prepared By: Reviewed By:	**Title:** **MW-1 CONSTITUENTS-OF-CONCERN TREND GRAPHS** **Randolph County Landfill** **Permit No. 76-01**	**Figure No. 15**



Golder Associates

DATE: 03/15/13

Project #: 0739612702

Prepared By:

Reviewed By:

Title:

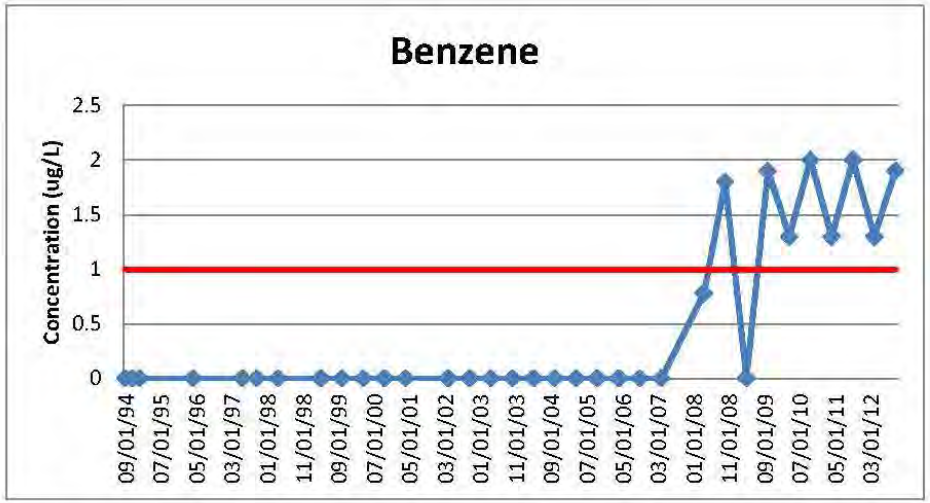
MW-6 CONSTITUENTS-OF-CONCERN TREND GRAPHS

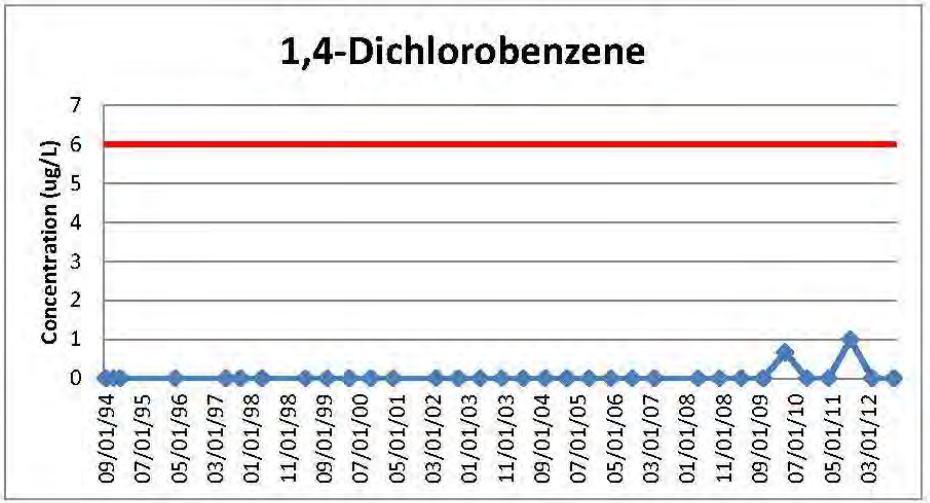
Nature and Extent Study

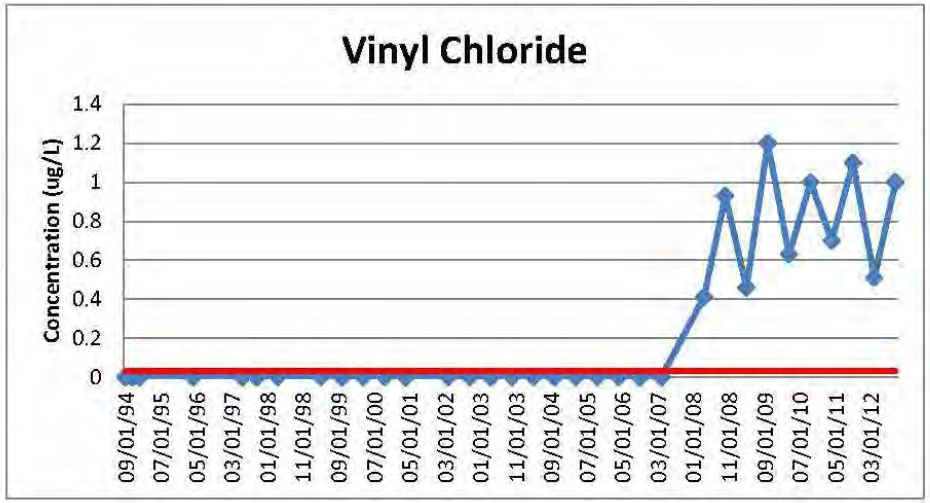
Randolph County Landfill, Permit No. 76-01

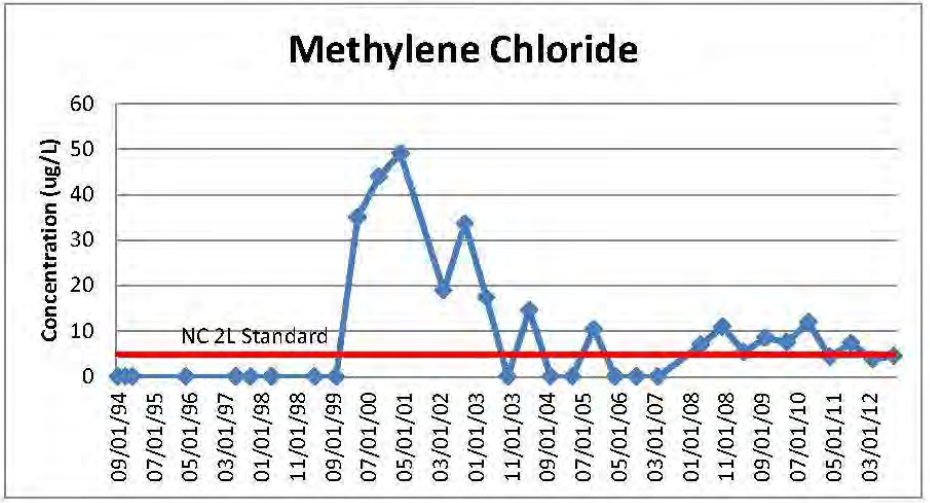
Figure No.

16









Golder Associates

DATE: 03/15/13

Project #: 0739612702

Prepared By:

Reviewed By:

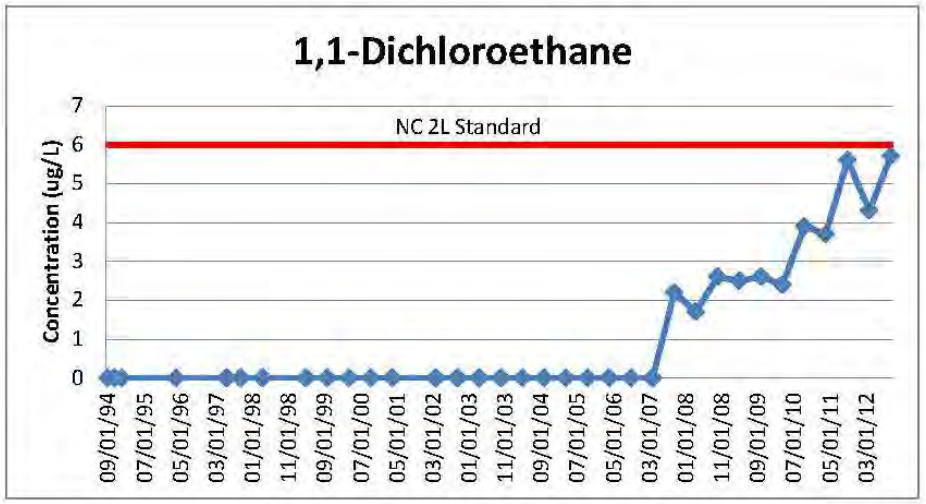
Title:

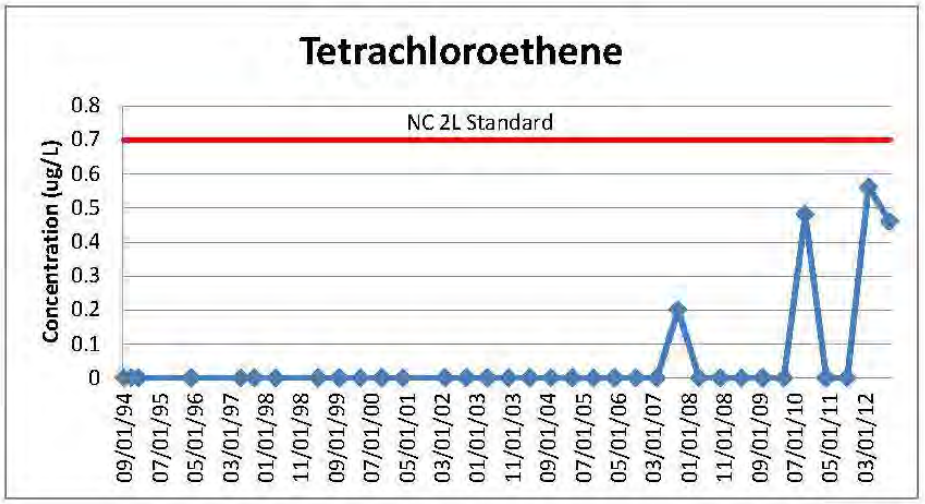
MW-7 CONSTITUENTS-OF-CONCERN TREND GRAPHS

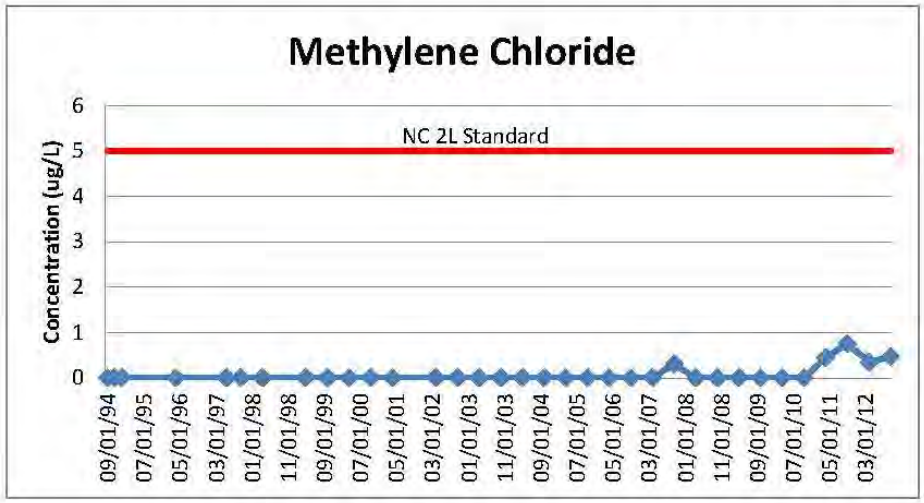
Nature and Extent Study

Randolph County Landfill, Permit No. 76-01

Figure No. 17







Golder Associates

DATE: 03/15/13

Project #: 0739612702

Prepared By:

Reviewed By:

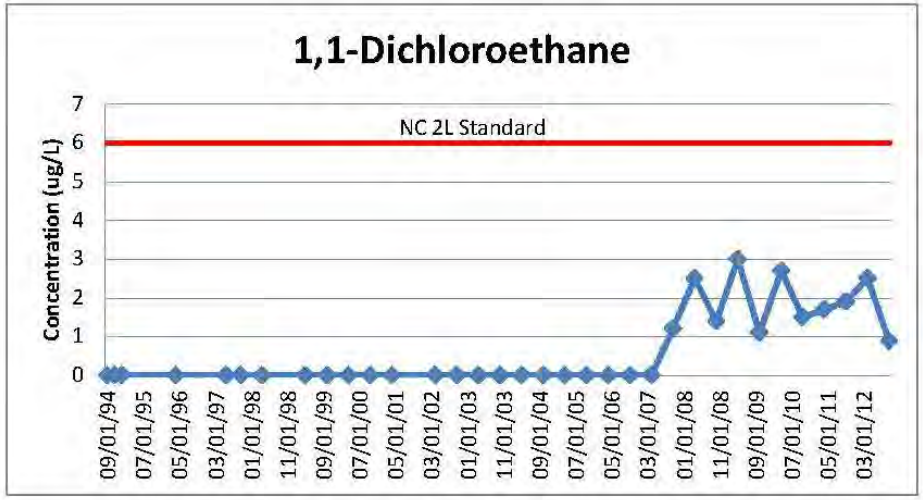
Title:

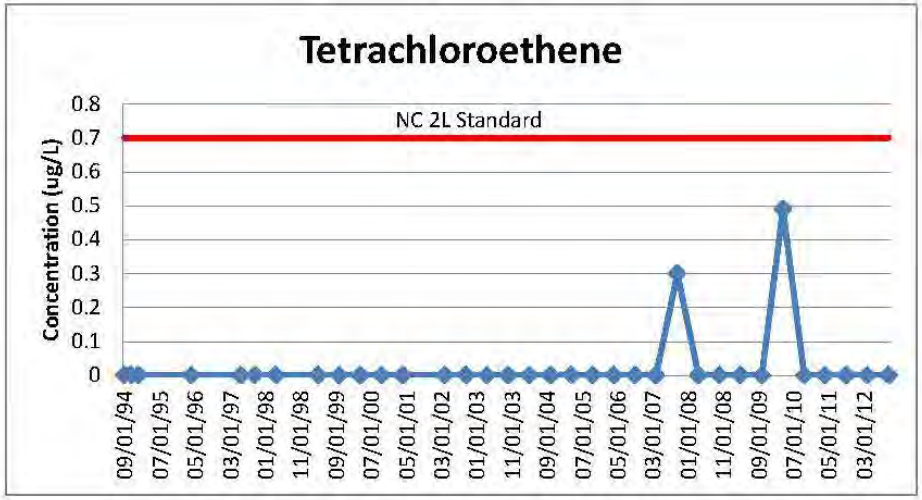
MW-8 CONSTITUENTS-OF-CONCERN TREND GRAPHS

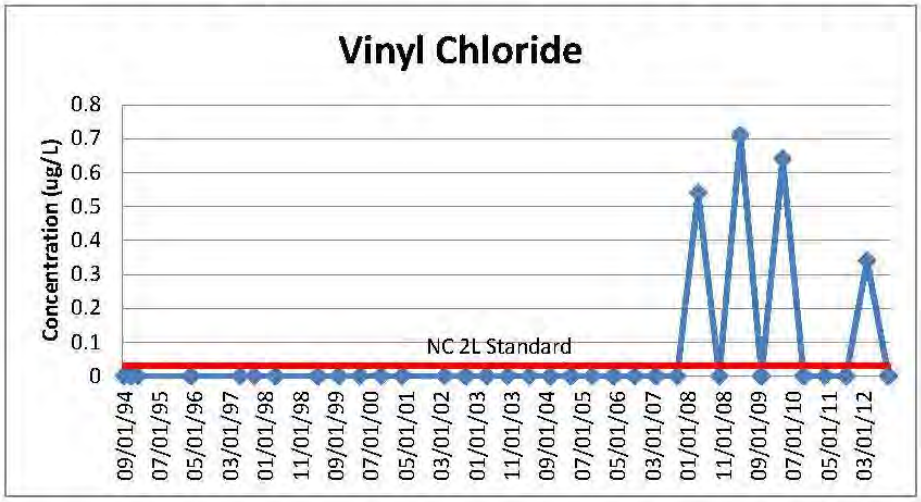
Nature and Extent Study

Randolph County Landfill, Permit No. 76-01

Figure No. 18







Golder Associates

DATE: 03/15/13

Project #: 0739612702

Prepared By:

Reviewed By:

Title:

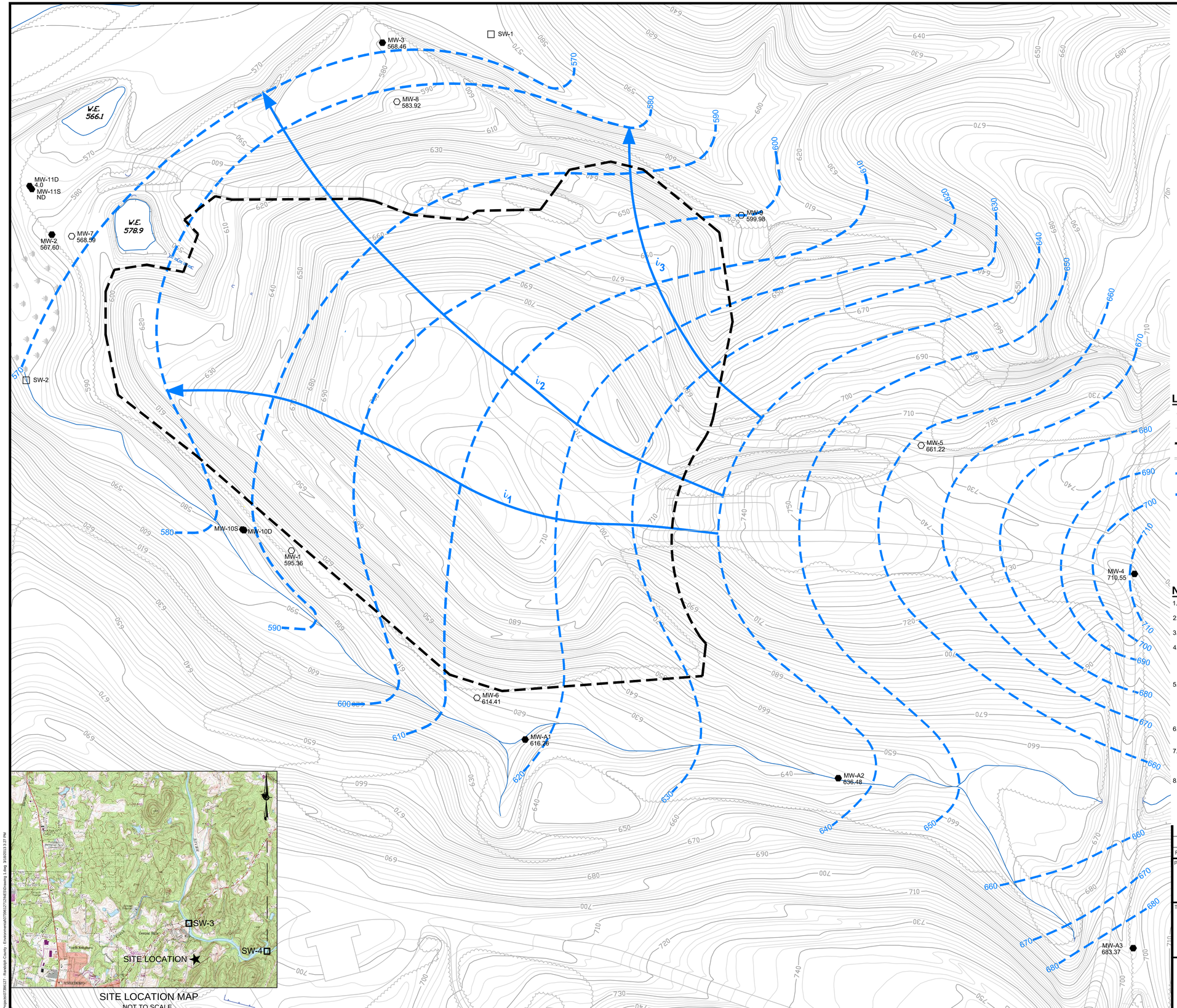
MW-9 CONSTITUENTS-OF-CONCERN TREND GRAPHS

Nature and Extent Study

Randolph County Landfill, Permit No. 76-01

Figure No. 19

DRAWINGS



SITE LOCATION MAP
NOT TO SCALE

LEGEND

- EXISTING 10 FT GROUND SURFACE CONTOUR
- EXISTING 2 FT GROUND SURFACE CONTOUR
- APPROXIMATE LIMITS OF WASTE
- EXISTING ROAD
- 640 — GROUNDWATER ELEVATION 10 FT CONTOURS
- GROUNDWATER FLOW ARROW
- MW-1 595.36 — COMPLIANCE MONITORING WELL AND GROUNDWATER ELEVATION
- MW-A2 636.48 — NON COMPLIANCE MONITORING WELL AND GROUNDWATER ELEVATION
- GM-1 — LANDFILL GAS MONITORING PROBE
- SW-1 — SURFACE WATER MONITORING POINT

NOTES

1. TOPOGRAPHIC CONTOUR INTERVAL = 2 FEET
2. GROUNDWATER SURFACE CONTOUR INTERVAL = 10 FEET
3. GROUNDWATER ELEVATIONS MEASURED ON APRIL 11-13, 2011.
4. 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 CONDITIONS.
5. GROUNDWATER CONTOUR LINES SHOW THE WATER TABLE SHAPE AND ELEVATION. THESE CONTOURS ARE INFERRED LINES FOLLOWING THE GROUNDWATER SURFACE AT A CONSTANT ELEVATION ABOVE SEA LEVEL. THE GROUNDWATER FLOW DIRECTION IS GENERALLY PERPENDICULAR TO THE GROUNDWATER SURFACE CONTOURS, SIMILAR TO THE RELATIONSHIP BETWEEN SURFACE WATER FLOW AND TOPOGRAPHIC CONTOURS.
6. MW-A1, MW-A2, MW-A3, MW-2, MW-3 AND MW-4 ARE NOT SAMPLED AS PART OF THE COMPLIANCE NETWORK.
7. BASE MAP PROVIDED BY HAZEN AND SAWYER, INC. OVERALL GROUND SURFACE TOPOGRAPHY OBTAINED FROM AERIAL SURVEY CONDUCTED BY KUCERA INTERNATIONAL INC., WILLOUGHBY, OHIO ON 8/2/93.
8. COORDINATE SYSTEM IS N.C. STATE PLANE GRID.

100 0 100 200
SCALE FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

PROJECT

RANDOLPH COUNTY LANDFILL
PERMIT NO. 76-01

TITLE

GROUNDWATER SURFACE CONTOUR MAP APRIL 11-13, 2011

Golder Associates
GOLDER ASSOCIATES, NC INC.

PROJECT No.	073-9612712		FILE No. Drawing 1		
DESIGN	DYR	03/18/2013	SCALE AS SHOWN	REV.	–
CADD	LKB	03/18/2013	DWG. 1		
CHECK	–	–			
REVIEW	–	–			

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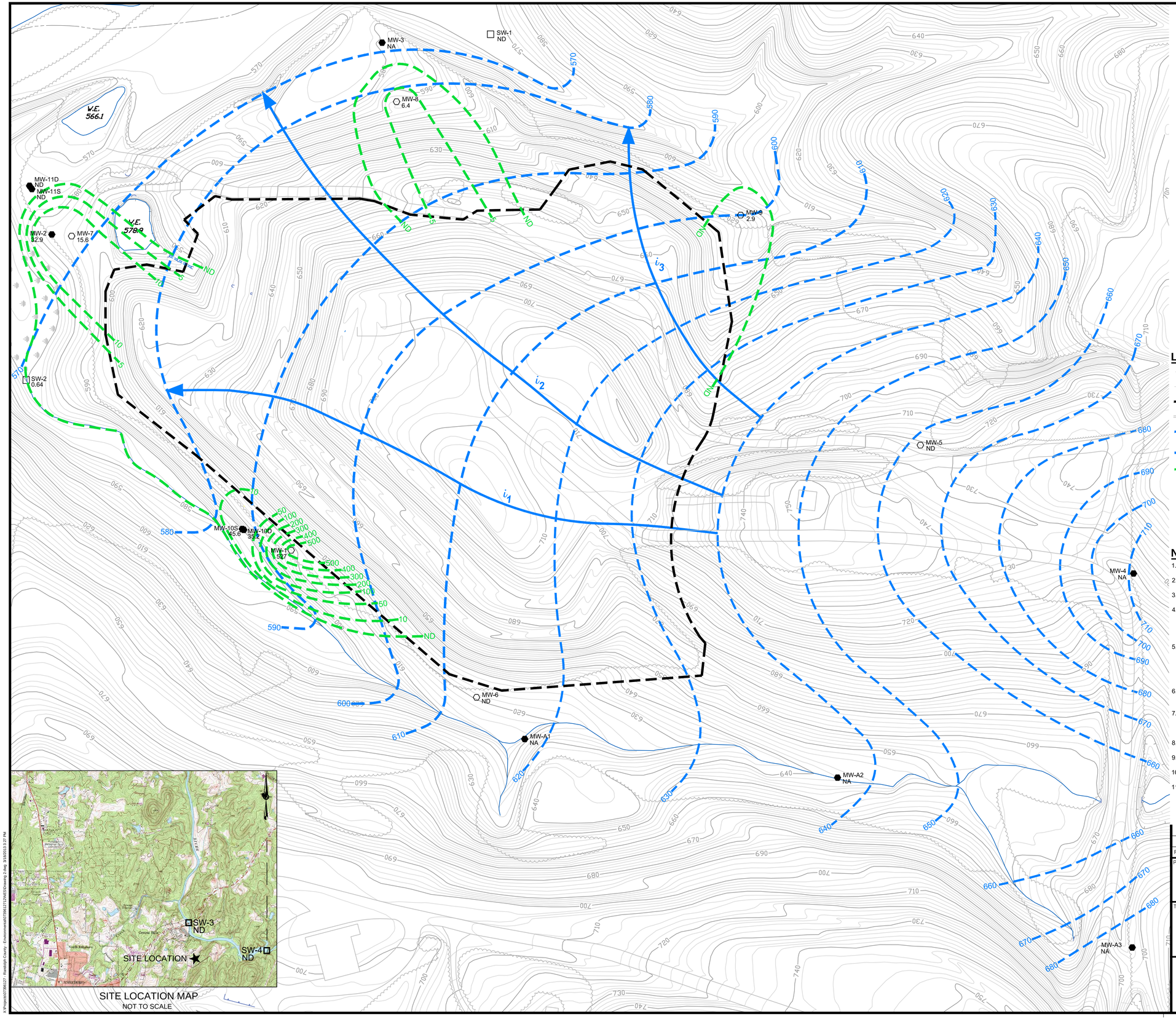

LEGEND

- EXISTING 10 FT GROUND SURFACE CONTOUR
- EXISTING 2 FT GROUND SURFACE CONTOUR
- APPROXIMATE LIMITS OF WASTE
- EXISTING ROAD
- 640 — GROUNDWATER ELEVATION 10 FT CONTOURS
- GROUNDWATER FLOW ARROW
- ND — TOTAL VOC ISOPLETH
- MW-1 530 — COMPLIANCE MONITORING WELL AND TOTAL VOC CONCENTRATION IN ug/L
- MW-A2 NA — NON COMPLIANCE MONITORING WELL
- GM-1 — LANDFILL GAS MONITORING PROBE
- SW-1 ND — SURFACE WATER MONITORING POINT AND TOTAL VOC CONCENTRATION IN ug/L

NOTES

1. TOPOGRAPHIC CONTOUR INTERVAL = 2 FEET
2. GROUNDWATER SURFACE CONTOUR INTERVAL = 10 FEET
3. GROUNDWATER ELEVATIONS MEASURED ON APRIL 11-13, 2011.
4. 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 CONDITIONS.
5. GROUNDWATER CONTOUR LINES SHOW THE WATER TABLE SHAPE AND ELEVATION. THESE CONTOURS ARE INFERRED LINES FOLLOWING THE GROUNDWATER SURFACE AT A CONSTANT ELEVATION ABOVE SEA LEVEL. THE GROUNDWATER FLOW DIRECTION IS GENERALLY PERPENDICULAR TO THE GROUNDWATER SURFACE CONTOURS, SIMILAR TO THE RELATIONSHIP BETWEEN SURFACE WATER FLOW AND TOPOGRAPHIC CONTOURS.
6. MW-A1, MW-A2, MW-A3, MW-2, MW-3 , MW-4, MW-10S. MW-10D, MW-11S, AND MW-11D ARE NOT SAMPLED AS PART OF THE COMPLIANCE NETWORK.
7. BASE MAP PROVIDED BY HAZEN AND SAWYER, INC. OVERALL GROUND SURFACE TOPOGRAPHY OBTAINED FROM AERIAL SURVEY CONDUCTED BY KUCERA INTERNATIONAL INC., WILLOUGHBY, OHIO ON 8/2/93.
8. COORDINATE SYSTEM IS N.C. STATE PLANE GRID.
9. ND = NOT DETECTED ABOVE LABORATORY DETECTION LIMIT.
10. NA = NOT ANALYZED
11. THE DETECTION OF DIETHYLETHELATE IN THE SAMPLE FROM MW-5 APPEARS TO BE ANOMALOUS AND WAS NOT INCLUDED.

100 0 100 200
SCALE FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

PROJECT

RANDOLPH COUNTY LANDFILL
PERMIT NO. 76-01

TITLE

TOTAL VOC ISOPLETH MAP WITH GROUNDWATER SURFACE CONTOURS APRIL 2011

Golder Associates
GOLDER ASSOCIATES, NC INC.

PROJECT No.	073-9612712		FILE No. Drawing 2
DESIGN	DYR	3/11/13	SCALE AS SHOWN REV. –
CADD	LKB	3/11/13	DWG. 2
CHECK			
REVIEW			

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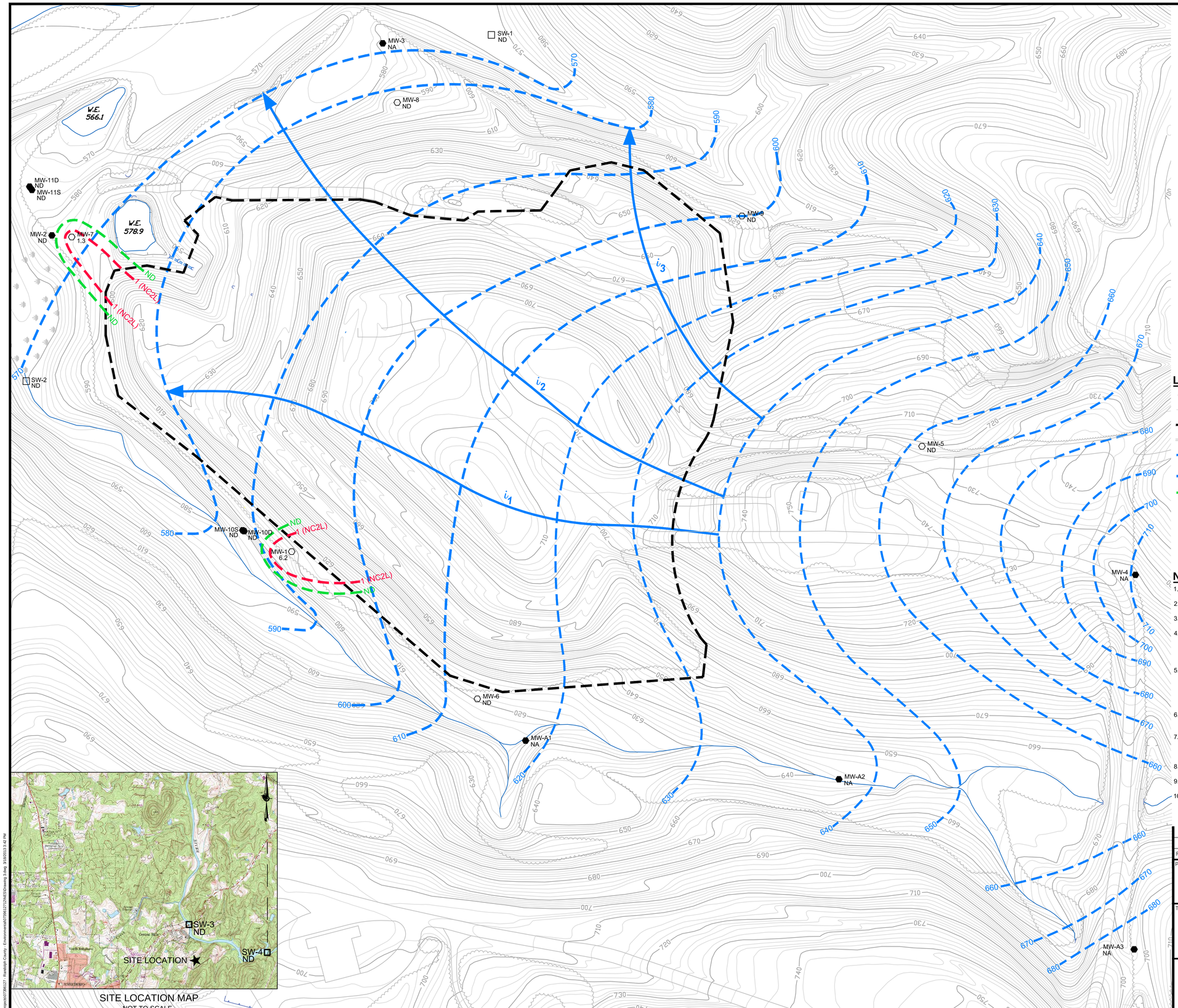

LEGEND

- EXISTING 10 FT GROUND SURFACE CONTOUR
- EXISTING 2 FT GROUND SURFACE CONTOUR
- APPROXIMATE LIMITS OF WASTE
- EXISTING ROAD
- 640 — GROUNDWATER ELEVATION 10 FT CONTOURS
- GROUNDWATER FLOW ARROW
- ND — BENZENE ISOPLETH
- MW-1 6.2 — COMPLIANCE MONITORING WELL AND BENZENE CONCENTRATION IN ug/L
- MW-A2 NA — NON COMPLIANCE MONITORING WELL
- GM-1 — LANDFILL GAS MONITORING PROBE
- SW-1 ND — SURFACE WATER MONITORING POINT AND BENZENE CONCENTRATION IN ug/L

NOTES

1. TOPOGRAPHIC CONTOUR INTERVAL = 2 FEET
2. GROUNDWATER SURFACE CONTOUR INTERVAL = 10 FEET
3. GROUNDWATER ELEVATIONS MEASURED ON APRIL 11-13, 2011.
4. 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 CONDITIONS.
5. GROUNDWATER CONTOUR LINES SHOW THE WATER TABLE SHAPE AND ELEVATION. THESE CONTOURS ARE INFERRED LINES FOLLOWING THE GROUNDWATER SURFACE AT A CONSTANT ELEVATION ABOVE SEA LEVEL. THE GROUNDWATER FLOW DIRECTION IS GENERALLY PERPENDICULAR TO THE GROUNDWATER SURFACE CONTOURS, SIMILAR TO THE RELATIONSHIP BETWEEN SURFACE WATER FLOW AND TOPOGRAPHIC CONTOURS.
6. MW-A1, MW-A2, MW-A3, MW-2, MW-3, MW-4, MW-10S, MW-10D, MW-11S, AND MW-11D ARE NOT SAMPLED AS PART OF THE COMPLIANCE NETWORK.
7. BASE MAP PROVIDED BY HAZEN AND SAWYER, INC. OVERALL GROUND SURFACE TOPOGRAPHY OBTAINED FROM AERIAL SURVEY CONDUCTED BY KUCERA INTERNATIONAL INC., WILLOUGHBY, OHIO ON 8/2/93.
8. COORDINATE SYSTEM IS N.C. STATE PLANE GRID.
9. ND = NOT DETECTED ABOVE LABORATORY DETECTION LIMIT
10. NA = NOT ANALYZED

100 0 100 200
SCALE FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

PROJECT

RANDOLPH COUNTY LANDFILL
PERMIT NO. 76-01

TITLE

BENZENE ISOPLETH MAP WITH GROUNDWATER SURFACE CONTOURS APRIL 2011

Golder Associates
GOLDER ASSOCIATES, NC INC.

PROJECT No.	073-9612712		FILE No. Drawing 3		
DESIGN	DYR	3/11/13	SCALE	AS SHOWN	REV. –
CADD	LKB	3/11/13	DWG. 3		
CHECK					
REVIEW					

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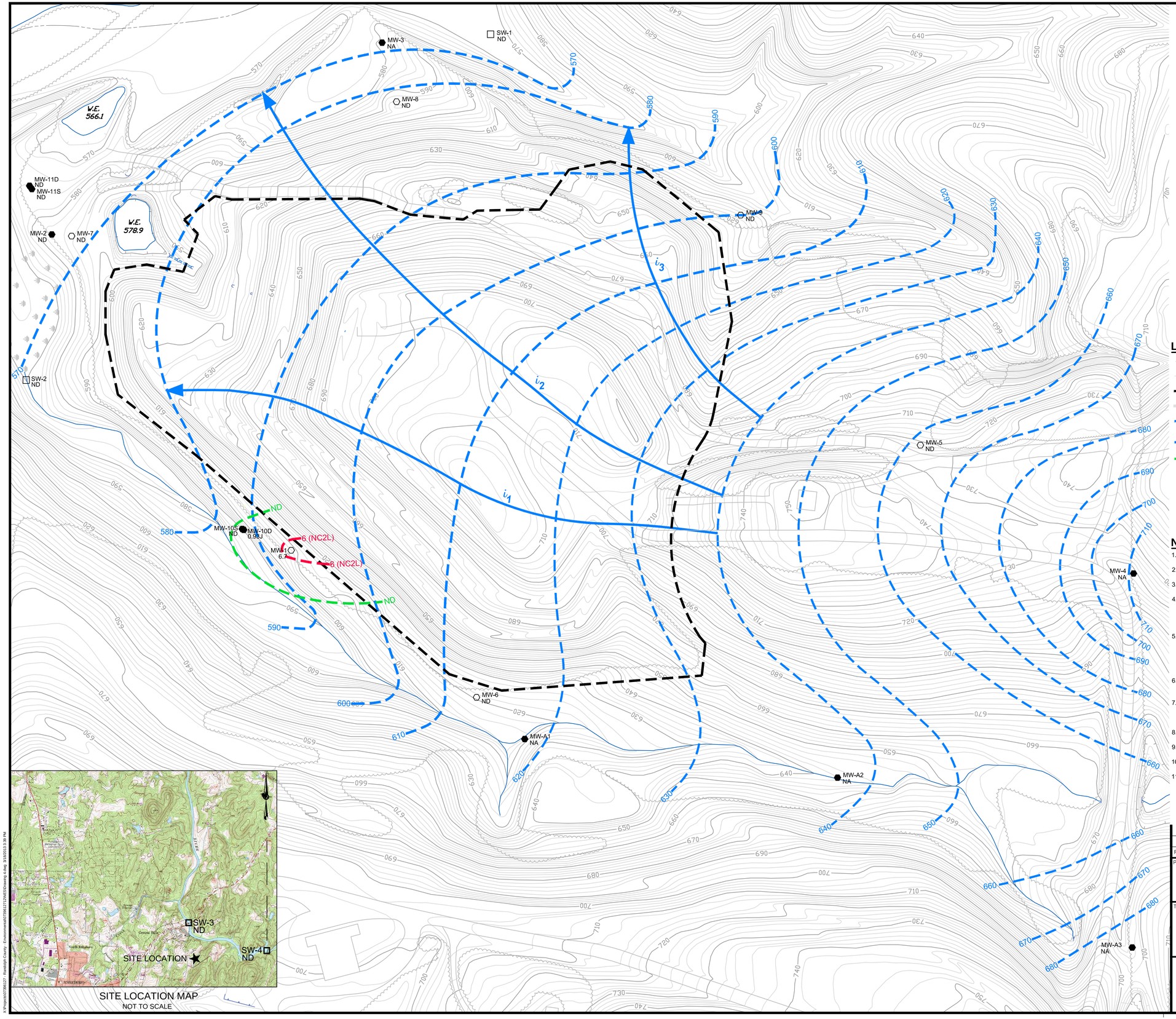

SITE LOCATION MAP
NOT TO SCALE

LEGEND

- EXISTING 10 FT GROUND SURFACE CONTOUR
- EXISTING 2 FT GROUND SURFACE CONTOUR
- APPROXIMATE LIMITS OF WASTE
- EXISTING ROAD
- 640 — GROUNDWATER ELEVATION 10 FT CONTOURS
- GROUNDWATER FLOW ARROW
- ND — 1,4 - DICHLOROBENZENE ISOPLETH
- MW-1 6.7 — COMPLIANCE MONITORING WELL AND 1,4 - DICHLOROBENZENE CONCENTRATION IN ug/L
- MW-A2 NA — NON COMPLIANCE MONITORING WELL
- GM-1 — LANDFILL GAS MONITORING PROBE
- SW-1 ND — SURFACE WATER MONITORING POINT AND 1,4 - DICHLOROBENZENE CONCENTRATION IN ug/L

NOTES

1. TOPOGRAPHIC CONTOUR INTERVAL = 2 FEET
2. GROUNDWATER SURFACE CONTOUR INTERVAL = 10 FEET
3. GROUNDWATER ELEVATIONS MEASURED ON APRIL 11-13, 2011.
4. 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 CONDITIONS.
5. GROUNDWATER CONTOUR LINES SHOW THE WATER TABLE SHAPE AND ELEVATION. THESE CONTOURS ARE INFERRED LINES FOLLOWING THE GROUNDWATER SURFACE AT A CONSTANT ELEVATION ABOVE SEA LEVEL. THE GROUNDWATER FLOW DIRECTION IS GENERALLY PERPENDICULAR TO THE GROUNDWATER SURFACE CONTOURS, SIMILAR TO THE RELATIONSHIP BETWEEN SURFACE WATER FLOW AND TOPOGRAPHIC CONTOURS.
6. MW-A1, MW-A2, MW-A3, MW-2, MW-3 ,MW-4, MW-10S, MW-10D, MW-11S, AND MW-11D ARE NOT SAMPLED AS PART OF THE COMPLIANCE NETWORK.
7. BASE MAP PROVIDED BY HAZEN AND SAWYER, INC. OVERALL GROUND SURFACE TOPOGRAPHY OBTAINED FROM AERIAL SURVEY CONDUCTED BY KUCERA INTERNATIONAL INC., WILLOUGHBY, OHIO ON 8/2/93.
8. COORDINATE SYSTEM IS N.C. STATE PLANE GRID.
9. ND = NOT DETECTED ABOVE LABORATORY DETECTION LIMIT
10. NA = NOT ANALYZED
11. J = ESTIMATED CONCENTRATION BELOW SOLID WASTE REPORTING LIMIT

100 0 100 200
SCALE FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

PROJECT

RANDOLPH COUNTY LANDFILL
PERMIT NO. 76-01

TITLE

1,4 - DICHLOROBENZENE ISOPLETH MAP WITH GROUNDWATER SURFACE CONTOURS APRIL 2011

Golder Associates
GOLDER ASSOCIATES, NC INC.

PROJECT No.	073-9612712		FILE No. Drawing 4	
DESIGN	DYR	3/11/13	SCALE AS SHOWN	REV. -
CADD	LKB	3/11/13	DWG. 4	
CHECK				
REVIEW				

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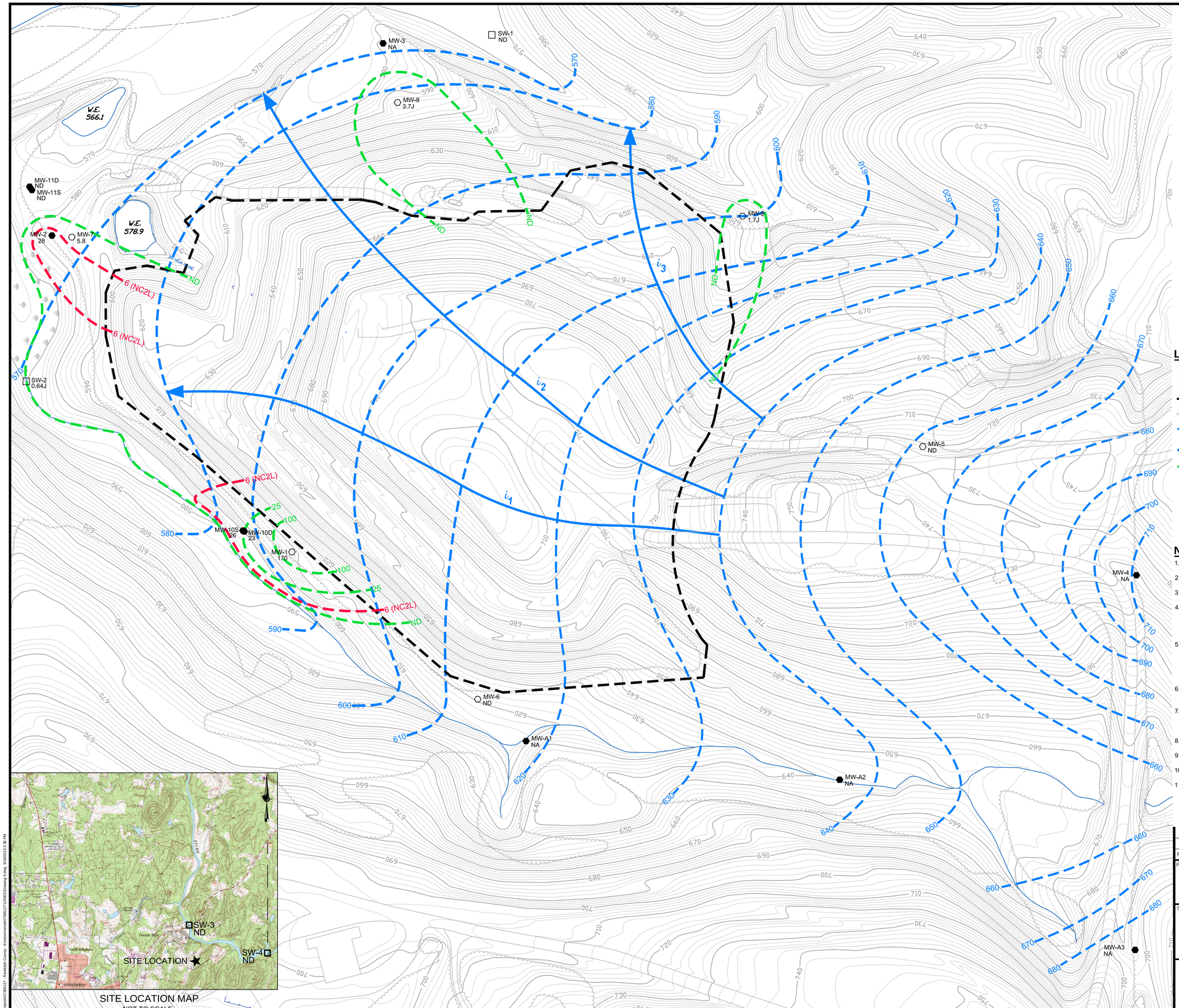

SITE LOCATION MAP
NOT TO SCALE

LEGEND

- EXISTING 10 FT GROUND SURFACE CONTOUR
- EXISTING 2 FT GROUND SURFACE CONTOUR
- APPROXIMATE LIMITS OF WASTE
- EXISTING ROAD
- 640 — GROUNDWATER ELEVATION 10 FT CONTOURS
- GROUNDWATER FLOW ARROW
- ND — 1,1 - DICHLOROETHANE ISOPLETH
- MW-1 170 — COMPLIANCE MONITORING WELL AND 1,1 - DICHLOROETHANE CONCENTRATION IN ug/L
- MW-A2 NA — NON COMPLIANCE MONITORING WELL
- GM-1 — LANDFILL GAS MONITORING PROBE
- SW-1 ND — SURFACE WATER MONITORING POINT AND 1,1 - DICHLOROETHANE CONCENTRATION IN ug/L

NOTES

1. TOPOGRAPHIC CONTOUR INTERVAL = 2 FEET
2. GROUNDWATER SURFACE CONTOUR INTERVAL = 10 FEET
3. GROUNDWATER ELEVATIONS MEASURED ON APRIL 11-13, 2011.
4. 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 CONDITIONS.
5. GROUNDWATER CONTOUR LINES SHOW THE WATER TABLE SHAPE AND ELEVATION. THESE CONTOURS ARE INFERRED LINES FOLLOWING THE GROUNDWATER SURFACE AT A CONSTANT ELEVATION ABOVE SEA LEVEL. THE GROUNDWATER FLOW DIRECTION IS GENERALLY PERPENDICULAR TO THE GROUNDWATER SURFACE CONTOURS, SIMILAR TO THE RELATIONSHIP BETWEEN SURFACE WATER FLOW AND TOPOGRAPHIC CONTOURS.
6. MW-A1, MW-A2, MW-A3, MW-2, MW-3 , MW-4, MW-10S, MW-10D, MW-11S, AND MW-11D ARE NOT SAMPLED AS PART OF THE COMPLIANCE NETWORK.
7. BASE MAP PROVIDED BY HAZEN AND SAWYER, INC. OVERALL GROUND SURFACE TOPOGRAPHY OBTAINED FROM AERIAL SURVEY CONDUCTED BY KUCERA INTERNATIONAL INC., WILLOUGHBY, OHIO ON 8/2/93.
8. COORDINATE SYSTEM IS N.C. STATE PLANE GRID.
9. ND = NOT DETECTED ABOVE LABORATORY DETECTION LIMIT
10. NA = NOT ANALYZED
11. J = ESTIMATED CONCENTRATION BELOW SOLID WASTE REPORTING LIMIT.

100 0 100 200
SCALE FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

PROJECT

RANDOLPH COUNTY LANDFILL
PERMIT NO. 76-01

TITLE

1,1 - DICHLOROETHANE ISOPLETH MAP WITH GROUNDWATER SURFACE CONTOURS APRIL 2011

Golder Associates
GOLDER ASSOCIATES, NC INC.

PROJECT No.	073-9612712		FILE No.	Drawing 5.	
DESIGN	DYR	3/11/13	SCALE	AS SHOWN	REV. –
CADD	LKB	3/11/13	DWG. 5		
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REVIEW					

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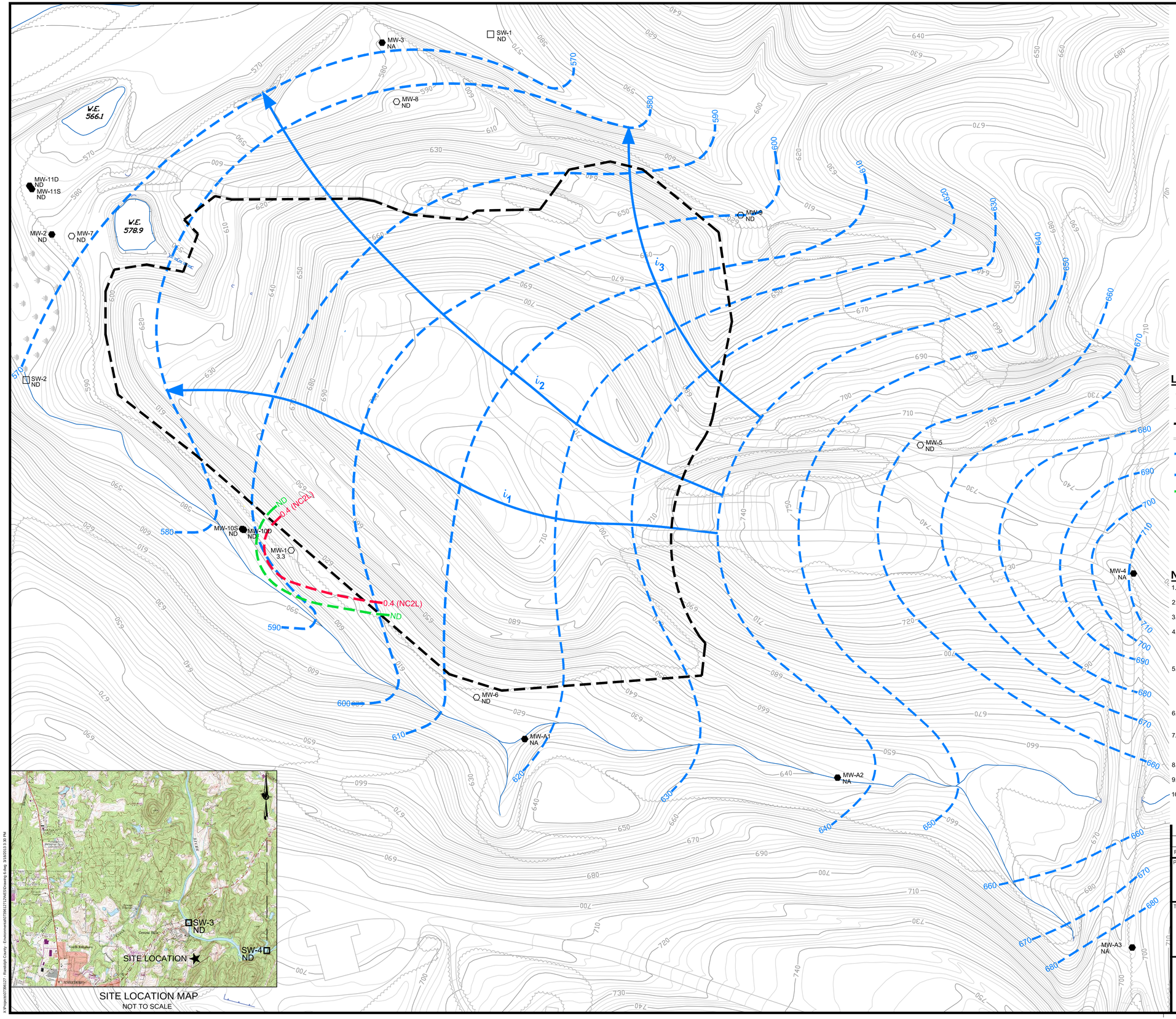

LEGEND

- EXISTING 10 FT GROUND SURFACE CONTOUR
- EXISTING 2 FT GROUND SURFACE CONTOUR
- APPROXIMATE LIMITS OF WASTE
- EXISTING ROAD
- 640 — GROUNDWATER ELEVATION 10 FT CONTOURS
- GROUNDWATER FLOW ARROW
- ND — 1,2 - DICHLOROETHANE ISOPLETH
- MW-1 3.3 — COMPLIANCE MONITORING WELL AND 1,2 - DICHLOROETHANE CONCENTRATION IN ug/L
- MW-A2 NA — NON COMPLIANCE MONITORING WELL
- GM-1 — LANDFILL GAS MONITORING PROBE
- SW-1 ND — SURFACE WATER MONITORING POINT AND 1,2 - DICHLOROETHANE CONCENTRATION IN ug/L

NOTES

1. TOPOGRAPHIC CONTOUR INTERVAL = 2 FEET
2. GROUNDWATER SURFACE CONTOUR INTERVAL = 10 FEET
3. GROUNDWATER ELEVATIONS MEASURED ON APRIL 11-13, 2011.
4. 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 CONDITIONS.
5. GROUNDWATER CONTOUR LINES SHOW THE WATER TABLE SHAPE AND ELEVATION. THESE CONTOURS ARE INFERRED LINES FOLLOWING THE GROUNDWATER SURFACE AT A CONSTANT ELEVATION ABOVE SEA LEVEL. THE GROUNDWATER FLOW DIRECTION IS GENERALLY PERPENDICULAR TO THE GROUNDWATER SURFACE CONTOURS, SIMILAR TO THE RELATIONSHIP BETWEEN SURFACE WATER FLOW AND TOPOGRAPHIC CONTOURS.
6. MW-A1, MW-A2, MW-A3, MW-2, MW-3 , MW-4, MW-10S, MW-10D, MW-11S, AND MW-11D ARE NOT SAMPLED AS PART OF THE COMPLIANCE NETWORK.
7. BASE MAP PROVIDED BY HAZEN AND SAWYER, INC. OVERALL GROUND SURFACE TOPOGRAPHY OBTAINED FROM AERIAL SURVEY CONDUCTED BY KUCERA INTERNATIONAL INC., WILLOUGHBY, OHIO ON 8/2/93.
8. COORDINATE SYSTEM IS N.C. STATE PLANE GRID.
9. ND = NOT DETECTED ABOVE LABORATORY DETECTION LIMIT
10. NA = NOT ANALYZED

100 0 100 200
SCALE FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

PROJECT

RANDOLPH COUNTY LANDFILL
PERMIT NO. 76-01

TITLE

1,2 - DICHLOROETHANE ISOPLETH MAP WITH GROUNDWATER SURFACE CONTOURS APRIL 2011

Golder Associates
GOLDER ASSOCIATES, NC INC.

PROJECT No.	073-9612712	FILE No. Drawing 6	
DESIGN	DYR	3/11/13	SCALE AS SHOWN REV. –
CADD	LKB	3/11/13	DWG. 6
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REVIEW			

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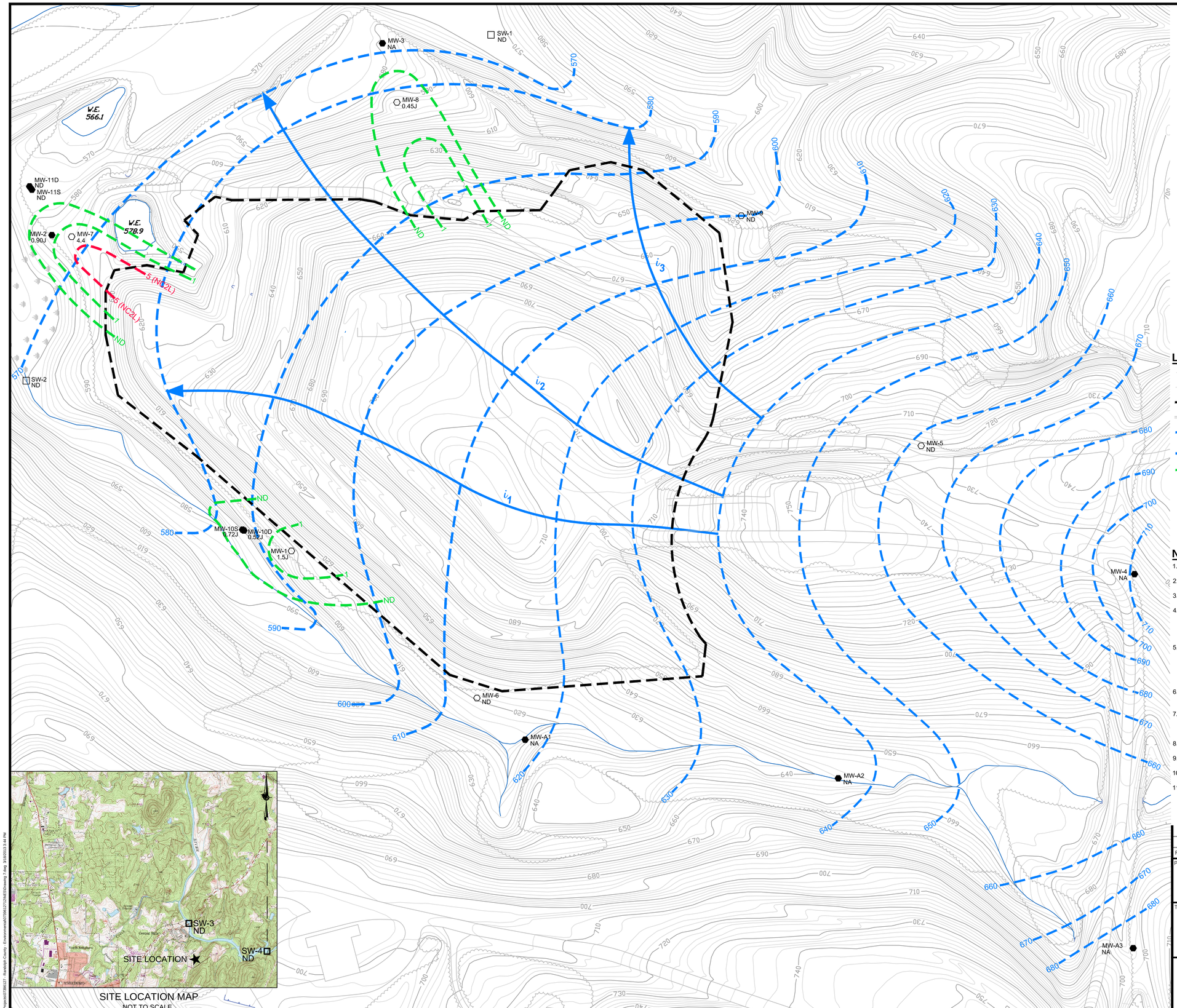

LEGEND

- EXISTING 10 FT GROUND SURFACE CONTOUR
- EXISTING 2 FT GROUND SURFACE CONTOUR
- APPROXIMATE LIMITS OF WASTE
- EXISTING ROAD
- 640 — GROUNDWATER ELEVATION 10 FT CONTOURS
- GROUNDWATER FLOW ARROW
- ND — METHYLENE CHLORIDE ISOPLETH
- MW-1 1.5J — COMPLIANCE MONITORING WELL AND METHYLENE CHLORIDE CONCENTRATION IN ug/L
- MW-A2 NA — NON COMPLIANCE MONITORING WELL
- GM-1 — LANDFILL GAS MONITORING PROBE
- SW-1 ND — SURFACE WATER MONITORING POINT AND METHYLENE CHLORIDE CONCENTRATION IN ug/L

NOTES

1. TOPOGRAPHIC CONTOUR INTERVAL = 2 FEET
2. GROUNDWATER SURFACE CONTOUR INTERVAL = 10 FEET
3. GROUNDWATER ELEVATIONS MEASURED ON APRIL 11-13, 2011.
4. 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 CONDITIONS.
5. GROUNDWATER CONTOUR LINES SHOW THE WATER TABLE SHAPE AND ELEVATION. THESE CONTOURS ARE INFERRED LINES FOLLOWING THE GROUNDWATER SURFACE AT A CONSTANT ELEVATION ABOVE SEA LEVEL. THE GROUNDWATER FLOW DIRECTION IS GENERALLY PERPENDICULAR TO THE GROUNDWATER SURFACE CONTOURS, SIMILAR TO THE RELATIONSHIP BETWEEN SURFACE WATER FLOW AND TOPOGRAPHIC CONTOURS.
6. MW-A1, MW-A2, MW-A3, MW-2, MW-3 , MW-4, MW-10S, MW-10D, MW-11S, AND MW-11D ARE NOT SAMPLED AS PART OF THE COMPLIANCE NETWORK.
7. BASE MAP PROVIDED BY HAZEN AND SAWYER, INC. OVERALL GROUND SURFACE TOPOGRAPHY OBTAINED FROM AERIAL SURVEY CONDUCTED BY KUCERA INTERNATIONAL INC., WILLOUGHBY, OHIO ON 8/2/93.
8. COORDINATE SYSTEM IS N.C. STATE PLANE GRID.
9. ND = NOT DETECTED ABOVE LABORATORY DETECTION LIMIT
10. NA = NOT ANALYZED
11. J = ESTIMATED CONCENTRATION BELOW SOLID WASTE SECTION REPORTING LIMIT

100 0 100 200
SCALE FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

PROJECT

RANDOLPH COUNTY LANDFILL
PERMIT NO. 76-01

TITLE

METHYLENE CHLORIDE ISOPLETH MAP WITH GROUNDWATER SURFACE CONTOURS APRIL 2011

Golder Associates
GOLDER ASSOCIATES, NC INC.

PROJECT No.	073-9612712		FILE No. Drawing 7	
DESIGN	DYR	3/11/13	SCALE AS SHOWN	REV. –
CADD	LKB	3/11/13	DWG. 7	
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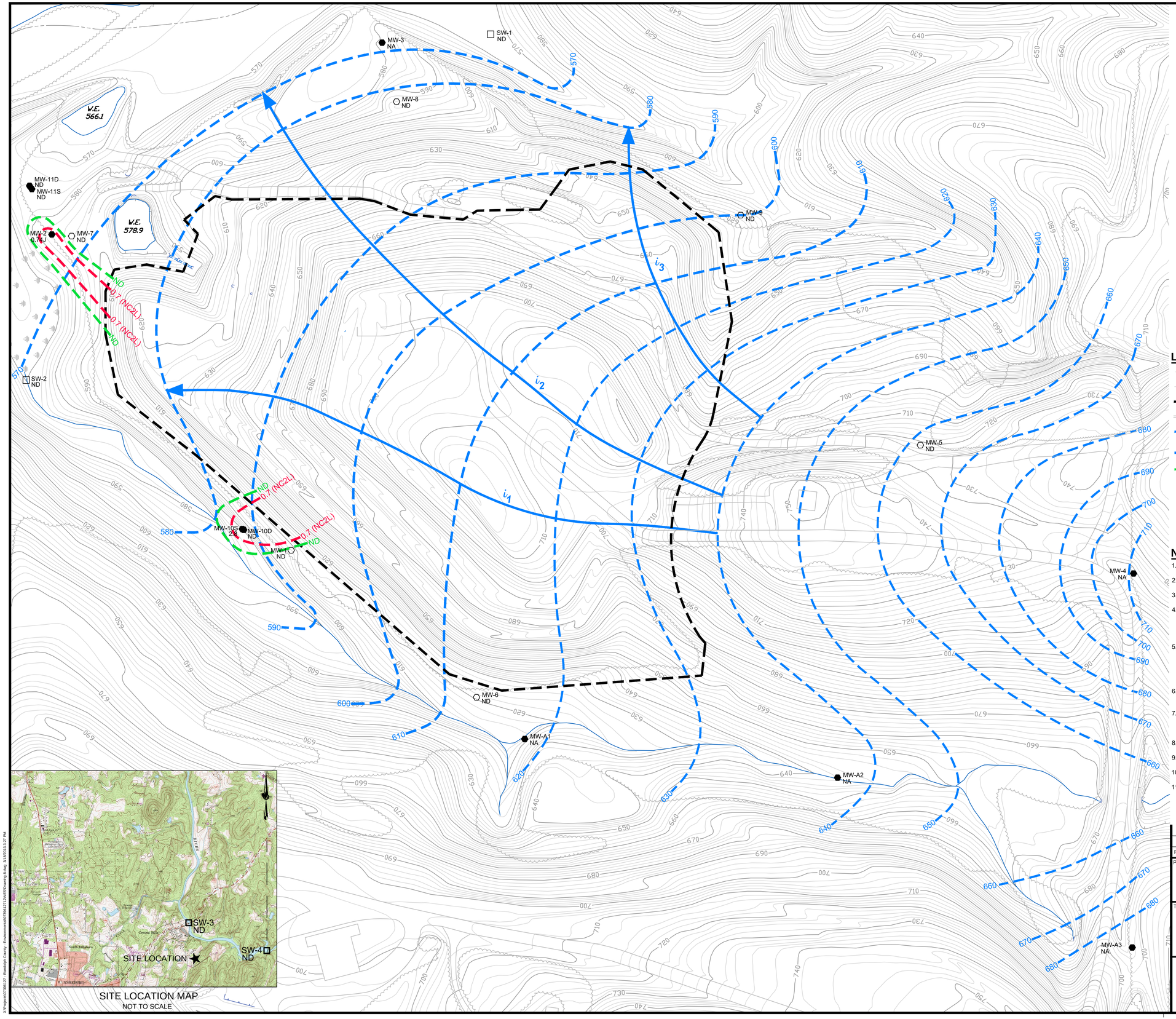

LEGEND

- EXISTING 10 FT GROUND SURFACE CONTOUR
- EXISTING 2 FT GROUND SURFACE CONTOUR
- APPROXIMATE LIMITS OF WASTE
- EXISTING ROAD
- 640 — GROUNDWATER ELEVATION 10 FT CONTOURS
- GROUNDWATER FLOW ARROW
- ND — TETRACHLOROETHENE ISOPLETH
- MW-1 ND — COMPLIANCE MONITORING WELL AND TETRACHLOROETHENE CONCENTRATION IN ug/L
- MW-A2 NA — NON COMPLIANCE MONITORING WELL
- GM-1 — LANDFILL GAS MONITORING PROBE
- SW-1 ND — SURFACE WATER MONITORING POINT AND TETRACHLOROETHENE CONCENTRATION IN ug/L

NOTES

1. TOPOGRAPHIC CONTOUR INTERVAL = 2 FEET
2. GROUNDWATER SURFACE CONTOUR INTERVAL = 10 FEET
3. GROUNDWATER ELEVATIONS MEASURED ON APRIL 11-13, 2011.
4. 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 CONDITIONS.
5. GROUNDWATER CONTOUR LINES SHOW THE WATER TABLE SHAPE AND ELEVATION. THESE CONTOURS ARE INFERRED LINES FOLLOWING THE GROUNDWATER SURFACE AT A CONSTANT ELEVATION ABOVE SEA LEVEL. THE GROUNDWATER FLOW DIRECTION IS GENERALLY PERPENDICULAR TO THE GROUNDWATER SURFACE CONTOURS, SIMILAR TO THE RELATIONSHIP BETWEEN SURFACE WATER FLOW AND TOPOGRAPHIC CONTOURS.
6. MW-A1, MW-A2, MW-A3, MW-2, MW-3 , MW-4, MW-10S, MW-10D, MW-11S, AND MW-11D ARE NOT SAMPLED AS PART OF THE COMPLIANCE NETWORK.
7. BASE MAP PROVIDED BY HAZEN AND SAWYER, INC. OVERALL GROUND SURFACE TOPOGRAPHY OBTAINED FROM AERIAL SURVEY CONDUCTED BY KUCERA INTERNATIONAL INC., WILLOUGHBY, OHIO ON 8/2/93.
8. COORDINATE SYSTEM IS N.C. STATE PLANE GRID.
9. ND = NOT DETECTED ABOVE LABORATORY DETECTION LIMIT
10. NA = NOT ANALYZED
11. J = ESTIMATED CONCENTRATION BELOW SOLID WASTE REPORTING LIMIT

100 0 100 200
SCALE FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

PROJECT

RANDOLPH COUNTY LANDFILL
PERMIT NO. 76-01

TITLE

TETRACHLOROETHENE ISOPLETH MAP WITH GROUNDWATER SURFACE CONTOURS APRIL 2011

Golder Associates
GOLDER ASSOCIATES, NC INC.

PROJECT No.	073-9612712		FILE No.	Drawing 8	
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CADD	LKB	3/11/13	DWG. 8		
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MW-3
NA

SW-1
ND

MW-8
ND

W.E.
566.1

MW-11D
ND
MW-11S
ND

W.E.
578.9

MW-2
ND

MW-7
0.70J

ND

0.03 (NC2L)

ND

0.03 (NC2L)

SW-2
ND

MW-10S
ND

MW-10D
0.65J

0.03 (NC2L)

ND

0.03 (NC2L)

ND

MW-1
8.8

MW-9
ND

MW-5
ND

MW-4
NA

MW-6
ND

MW-A1
NA

MW-A2
NA

MW-A3
NA

i-1

i-2

i-3

SW-3
ND

SW-4
ND

SITE LOCATION

SITE LOCATION MAP
NOT TO SCALE

LEGEND

- EXISTING 10 FT GROUND SURFACE CONTOUR
- EXISTING 2 FT GROUND SURFACE CONTOUR
- APPROXIMATE LIMITS OF WASTE
- EXISTING ROAD
- 640 — GROUNDWATER ELEVATION 10 FT CONTOURS
- GROUNDWATER FLOW ARROW
- ND — VINYL CHLORIDE ISOPLETH
- MW-1 8.8 — COMPLIANCE MONITORING WELL AND VINYL CHLORIDE CONCENTRATION IN ug/L
- MW-A2 NA — NON COMPLIANCE MONITORING WELL
- GM-1 — LANDFILL GAS MONITORING PROBE
- SW-1 ND — SURFACE WATER MONITORING POINT AND VINYL CHLORIDE CONCENTRATION IN ug/L

NOTES

1. TOPOGRAPHIC CONTOUR INTERVAL = 2 FEET
2. GROUNDWATER SURFACE CONTOUR INTERVAL = 10 FEET
3. GROUNDWATER ELEVATIONS MEASURED ON APRIL 11-13, 2011.
4. 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 CONDITIONS.
5. GROUNDWATER CONTOUR LINES SHOW THE WATER TABLE SHAPE AND ELEVATION. THESE CONTOURS ARE INFERRED LINES FOLLOWING THE GROUNDWATER SURFACE AT A CONSTANT ELEVATION ABOVE SEA LEVEL. THE GROUNDWATER FLOW DIRECTION IS GENERALLY PERPENDICULAR TO THE GROUNDWATER SURFACE CONTOURS, SIMILAR TO THE RELATIONSHIP BETWEEN SURFACE WATER FLOW AND TOPOGRAPHIC CONTOURS.
6. MW-A1, MW-A2, MW-A3, MW-2, MW-3 , MW-4, MW-10S, MW-10D, MW-11S, AND MW-11D ARE NOT SAMPLED AS PART OF THE COMPLIANCE NETWORK.
7. BASE MAP PROVIDED BY HAZEN AND SAWYER, INC. OVERALL GROUND SURFACE TOPOGRAPHY OBTAINED FROM AERIAL SURVEY CONDUCTED BY KUCERA INTERNATIONAL INC., WILLOUGHBY, OHIO ON 8/2/93.
8. COORDINATE SYSTEM IS N.C. STATE PLANE GRID.
9. ND = NOT DETECTED ABOVE LABORATORY DETECTION LIMIT
10. NA = NOT ANALYZED
11. J = ESTIMATED CONCENTRATION BELOW SOLID WASTE REPORTING LIMIT

100 0 100 200
SCALE FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

PROJECT

RANDOLPH COUNTY LANDFILL
PERMIT NO. 76-01

TITLE

VINYL CHLORIDE ISOPLETH MAP WITH GROUNDWATER SURFACE CONTOURS APRIL 2011

Golder Associates
GOLDER ASSOCIATES, NC INC.

PROJECT No.	073-9612712		FILE No. Drawing 9	
DESIGN	DYR	3/11/13	SCALE AS SHOWN	REV. -
CADD	LKB	3/11/13		
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REVIEW				

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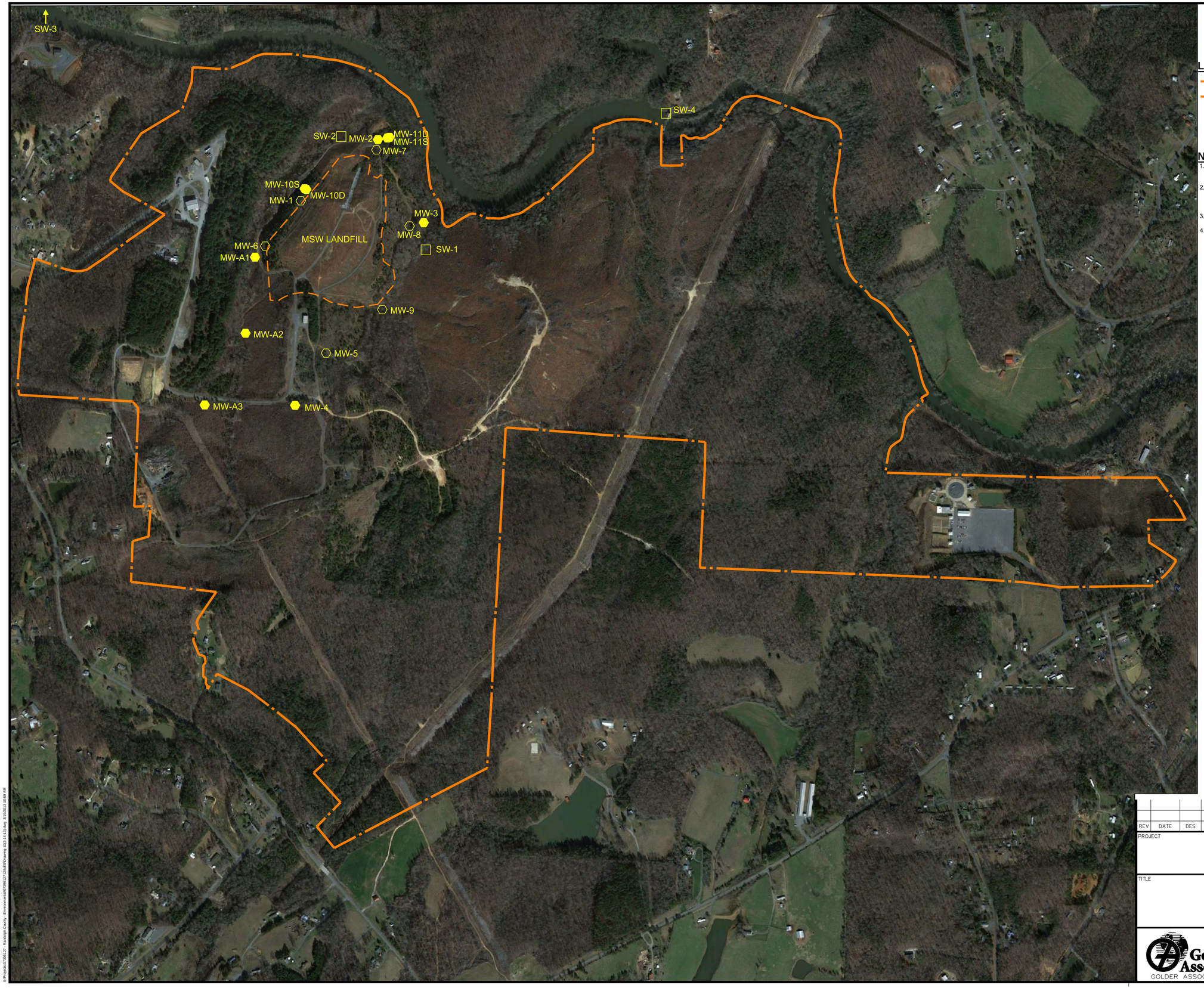

LEGEND

	PROPERTY BOUNDARY
	APPROXIMATE LIMITS OF WASTE
⬡ MW-1	COMPLIANCE MONITORING WELL
⬢ MW-A2	NON COMPLIANCE MONITORING WELL
□ SW-1	SURFACE WATER MONITORING WELL

NOTES

1. MW-A1, MW-A2, MW-A3, MW-2, MW-3 , MW-4, MW-10S, MW-10D, MW-11S, AND MW-11D ARE NOT SAMPLED AS PART OF THE COMPLIANCE NETWORK.
2. BASE MAP PROVIDED BY HAZEN AND SAWYER, INC. OVERALL GROUND SURFACE TOPOGRAPHY OBTAINED FROM AERIAL SURVEY CONDUCTED BY KUCERA INTERNATIONAL INC., WILLOUGHBY, OHIO ON 8/2/93.
3. COORDINATE SYSTEM IS N.C. STATE PLANE GRID.
4. AERIAL PHOTO IS FROM GOOGLE EARTH ON 2-12-2012.

400 0 400 800
SCALE FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

PROJECT

RANDOLPH COUNTY LANDFILL
PERMIT NO. 76-01

TITLE

SITE MAP

Golder Associates
GOLDER ASSOCIATES, NC INC.

PROJECT No.	073-9612712		FILE No. Drawing 10(3-14-13)	
DESIGN	DYR	03/19/2013	SCALE AS SHOWN	REV. –
CADD	LKB	03/19/2013	DWG. 10	
CHECK	–	–		
REVIEW	–	–		

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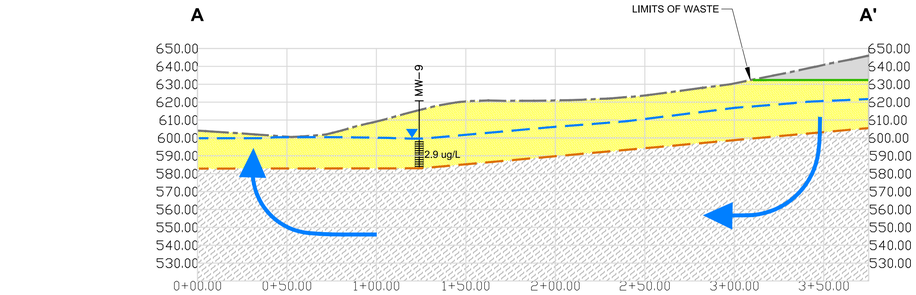

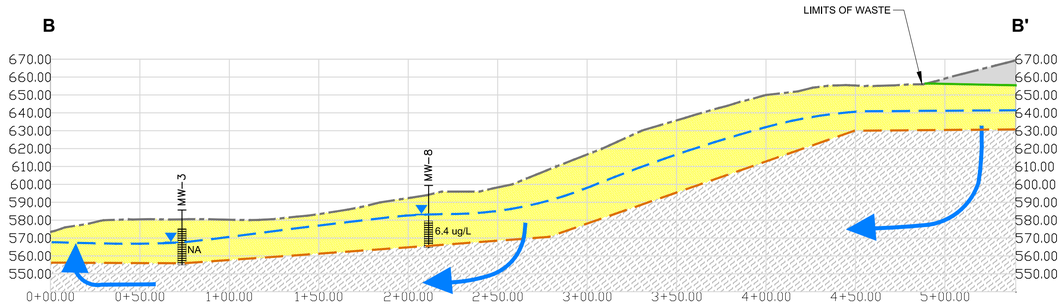

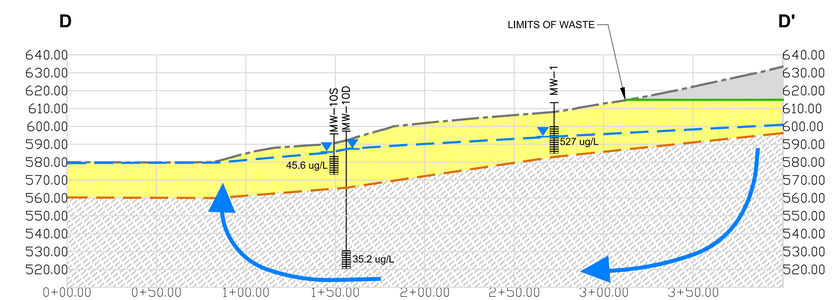

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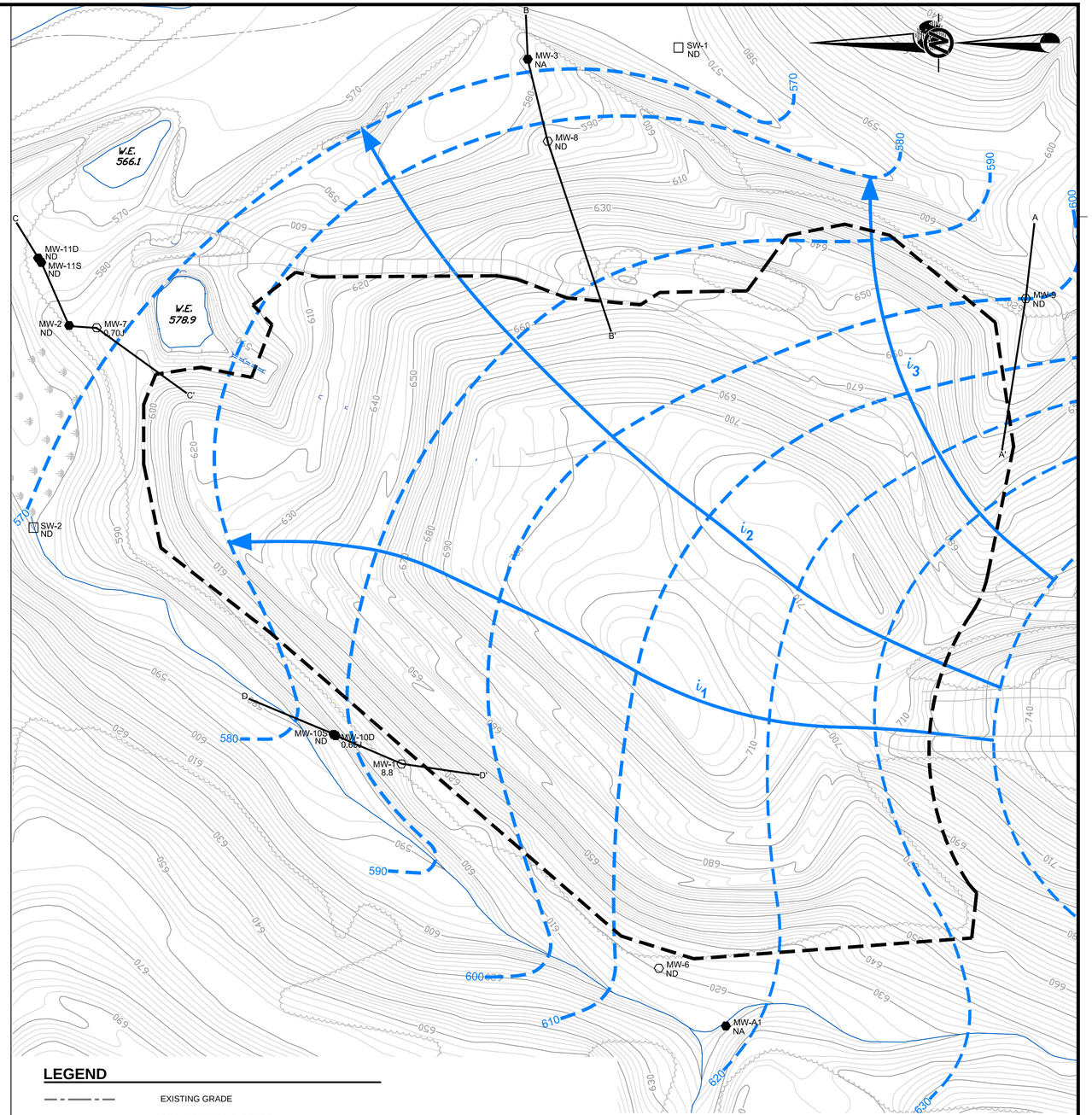

LEGEND

- EXISTING GRADE
- GROUNDWATER SURFACE
- BEDROCK SURFACE
- ANTICIPATED DIRECTION OF GROUNDWATER FLOW
- MONITORING WELL WITH SCREENED INTERVAL
- MEASURED GROUNDWATER ELEVATION
- SAPROLITE
- BEDROCK
- WASTE
- 2.9 ug/L — TOTAL VOC CONCENTRATION
- ND — NOT DETECTED
- NA — NOT ANALYZED

NOTES

1. DIFFERENCES BETWEEN SURFACE TOPOGRAPHY AND WELL ELEVATIONS EXIST DUE TO SOFTWARE INTERPOLATION OF SURFACE ELEVATIONS ALONG LINES OF SECTION.
2. GROUNDWATER ELEVATIONS MEASURED ON APRIL 11-13, 2011, AND THE GROUNDWATER CONTOURS WERE TAKEN FROM DRAWING 1.

100 0 100 200
SCALE FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

PROJECT

RANDOLPH COUNTY LANDFILL
PERMIT NO. 76-01

TITLE

LINE OF SECTION MAP AND CROSS-SECTIONS A-A', B-B', C-C', AND D-D'

Golder Associates
GREENSBORO, NC

PROJECT No.	073-9612712	FILE No. Drawing 11	
DESIGN	DYR	3/11/13	SCALE AS SHOWN REV. –
CADD	LKB	3/11/13	
CHECK			DWG. 11
REVIEW			

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APPENDIX A

BORING LOGS AND WELL CONSTRUCTION DIAGRAMS

RECORD OF BOREHOLE MW-10S

SHEET 1 of 1

PROJECT: Randolph County Landfill
PROJECT NUMBER: 0739-612711.400
DRILLED DEPTH: 25.0 ft
LOCATION: Randleman, NC

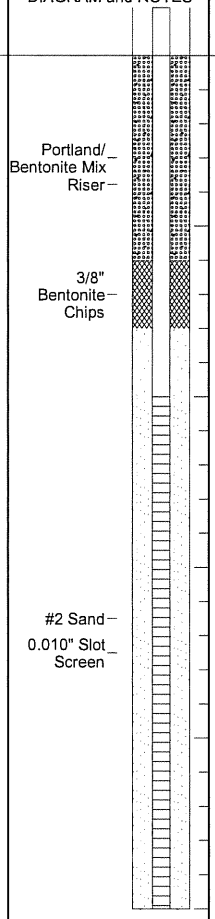
DRILL RIG: Gus Pech Brat
DATE STARTED: 12/8/10
DATE COMPLETED: 12/8/10

NORTHING: 731,020.7
EASTING: 1,773,274.2
GS ELEVATION: 594.5 ft
TOC ELEVATION: 596.9 ft

DEPTH W.L.:12.35
DATE W.L.:12/9/2010
TIME W.L.:10:59

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES REC
0		0.0 - 4.0 Lean CLAY, Red, Some Medium Sand and weathered gravel and cobble, moist	CL		590.5 / 4.0			
5	590	4.0 - 10.0 Cuttings lighten and become dryer, Tan to tanish orange	CL		584.5 / 10.0			
10	585	10.0 - 15.0 Hard layer, most likely a boulder	CL		579.5 / 15.0			
15	580	15.0 - 25.0 Cuttings showing signs of moisture	CL		569.5 / 25.0			
20	575							
25	570	25.0 - 26.5 PWR, Cuttings change to a light gray	PWR		568.0 / 26.5			
		26.5 - 28.0 Becomes harder based on drilling response	PWR		566.5 / 28.0			
30	565	Boring completed at 25.0 ft						
35	560							
40	555							
45	550							

MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES



WELL CONSTRUCTION DETAILS

WELL CASING
Interval: -2.44'-10'
Material: PVC
Diameter: 2"
Joint Type: Threaded

SURFACE CASING
Interval: N/A
Material: N/A
Diameter: N/A

WELL SCREEN
Interval: 10'-25'
Material: PVC
Diameter: 2"
Slot Size: 0.010"
End Cap: PVC

FILTER PACK
Interval: 8'-25'
Type: #2 Sand

FILTER PACK SEAL
Interval: 6'-8'
Type: 3/8" Bentonite Chips

ANNULUS SEAL
Interval: 0'-6'
Type: Portland/Bentonite Mix

WELL COMPLETION
Pad: 3'x3'x6" Concrete Pad
Protective Casing: 4" Aluminum

DRILLING METHODS
Soil Drill: 4 5/8" Roller Cone
Rock Drill: N/A

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: SAEDACCO
DRILLER: Robert Miller

GA INSPECTOR: David Reedy, P.G.
CHECKED BY: Ben Draper, P.G.
DATE: 2/14/12

Golder Associates

BOREHOLE RECORD NES WELL INSTALLATION.GPJ PIEDMONT.GDT 4/11/13

RECORD OF BOREHOLE MW-10D

SHEET 1 of 2

PROJECT: Randolph County Landfill
PROJECT NUMBER: 0739-612711.400
DRILLED DEPTH: 73.0 ft
LOCATION: Randleman, NC

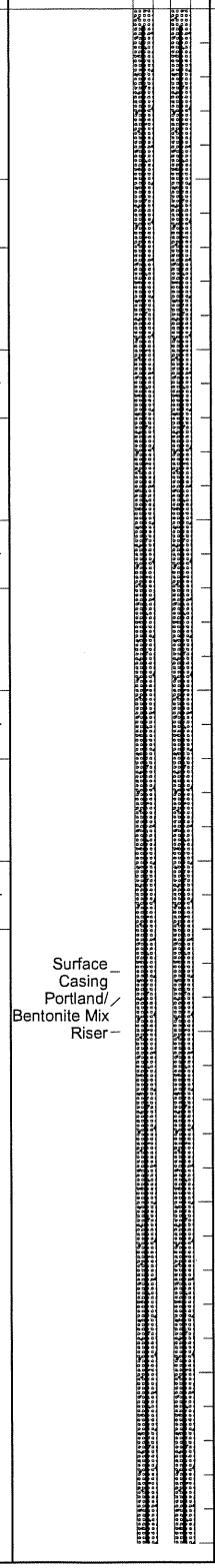
DRILL RIG: Gus Pech Brat
DATE STARTED: 12/7/10
DATE COMPLETED: 12/9/10

NORTHING: 731,017.2
EASTING: 1,773,270.4
GS ELEVATION: 594.6 ft
TOC ELEVATION: 596.8 ft

DEPTH W.L.:21.90'
DATE W.L.:12/9/2010
TIME W.L.:13:36

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE: DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS per 6 in (140 lb hammer 30 inch drop)	N	REC
0		0.0 - 5.0 Lean CLAY, Some medium sand, Some weathered gravel to cobble sized rock fragments (quartz and schist), Red clay, Large boulder at 0.5'	CL		589.6					
5	590	5.0 - 5.3 PWR, Gray weathered rock, Near horizontal foliation	PWR		5.3		SPT	10-14-30-33	44	1.0 / 2.0
		5.3 - 10.0 Silty SAND, Dark red to orange	SM		584.6					
10	585	10.0 - 10.3 PWR, Gray weathered rock	PWR		10.3		SPT	10-21-50/3	21	1.3 / 2.0
		10.3 - 15.0 Lean CLAY, Few quartz pebbles, Orange and red (mottled), Moist	CL		579.6					
15	580	15.0 - 20.0 SILT, Tan and black (mottled), Slightly moist	ML		15.0 574.6		SPT	12-17-21-22	38	1.6 / 2.0
20	575	20.0 - 25.0 Sandy SILT, Tan and reddish brown (mottled), Water present	ML		20.0 569.6		SPT	6-7-11-45	18	2.0 / 2.0
25	570	25.0 - 29.0 PWR, Silt, Light gray, Changes to gray weathered quartzite at 25.25', Silt and gravel sized rock fragments, Dry Auger Refusal @ 29'	PWR		25.0 565.6		SPT	17-50/6	50/6	1.0 / 2.0
30	565	29.0 - 36.0 BEDROCK, Gray cuttings, Hard competent rock	BR		29.0 558.6					
35	560	36.0 - 37.0 Weathered zone or Fracture	BR		36.0 557.6					
40	555	37.0 - 58.0 Gray cuttings, Hard competent rock	BR		37.0					
45	550	Log continued on next page								

MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES



WELL CONSTRUCTION DETAILS

WELL CASING
Interval: -2.24'-63'
Material: PVC
Diameter: 2"
Joint Type: Threaded

SURFACE CASING
Interval: 0'-56'
Material: PVC
Diameter: 6"

WELL SCREEN
Interval: 63'-73'
Material: PVC
Diameter: 2"
Slot Size: 0.010"
End Cap: PVC

FILTER PACK
Interval: 61'-73'
Type: #2 Sand

FILTER PACK SEAL
Interval: 58'-61'
Type: 3/8" Bentonite Chips

ANNULUS SEAL
Interval: 0'-58'
Type: Portland/Bentonite Mix

WELL COMPLETION
Pad: 3'x3'x6" Concrete
Protective Casing: 4" Aluminum Casing

DRILLING METHODS
Soil Drill: 8.25" ID HSA; 4.25" ID HSA
Rock Drill: 5 5/8" Downhole Hammer

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: SAEDACCO
DRILLER: Robert Miller

GA INSPECTOR: David Reedy, P.G.
CHECKED BY: Ben Draper, P.G.
DATE: 2/14/12

Golder Associates

BOREHOLE RECORD NES WELL INSTALLATION.GPJ PIEDMONT.GDT 4/11/13

RECORD OF BOREHOLE MW-10D

SHEET 2 of 2

PROJECT: Randolph County Landfill
PROJECT NUMBER: 0739-612711.400
DRILLED DEPTH: 73.0 ft
LOCATION: Randleman, NC

DRILL RIG: Gus Pech Brat
DATE STARTED: 12/7/10
DATE COMPLETED: 12/9/10

NORTHING: 731,017.2
EASTING: 1,773,270.4
GS ELEVATION: 594.6 ft
TOC ELEVATION: 596.8 ft

DEPTH W.L.:21.90'
DATE W.L.:12/9/2010
TIME W.L.:13:36

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE: DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS per 6 in (140 lb hammer 30 inch drop)	N	REC	MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
45		37.0 - 58.0 Gray cuttings, Hard competent rock *(Continued)*										
50	545		BR									
55	540				536.6							
60	535	58.0 - 67.0 White and gray cuttings, mostly quartz	BR		58.0						3/8" Bentonite Chips	
65	530				527.6						#2 Sand 0.010" Slot Screen	
70	525	67.0 - 70.0 Fracture zone at 67' (Based on drilling response)	BR		67.0 524.6							
75	520	70.0 - 73.0 Fracture at 70', Dust dies down	BR		70.0 521.6							
80	515	Boring completed at 73.0 ft										
85	510											
90	505											

WELL CASING
Interval: -2.24'-63'
Material: PVC
Diameter: 2"
Joint Type: Threaded

SURFACE CASING
Interval: 0'-56'
Material: PVC
Diameter: 6"

WELL SCREEN
Interval: 63'-73'
Material: PVC
Diameter: 2"
Slot Size: 0.010"
End Cap: PVC

FILTER PACK
Interval: 61'-73'
Type: #2 Sand

FILTER PACK SEAL
Interval: 58'-61'
Type: 3/8" Bentonite Chips

ANNULUS SEAL
Interval: 0'-58'
Type: Portland/Bentonite Mix

WELL COMPLETION
Pad: 3'x3'x6" Concrete
Protective Casing: 4" Aluminum Casing

DRILLING METHODS
Soil Drill: 8.25" ID HSA; 4.25" ID HSA
Rock Drill: 5 5/8" Downhole Hammer

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: SAEDACCO
DRILLER: Robert Miller

GA INSPECTOR: David Reedy, P.G.
CHECKED BY: Ben Draper, P.G.
DATE: 2/14/12

Golder Associates

BOREHOLE RECORD NES WELL INSTALLATION.GPJ PIEDMONT.GDT 4/11/13

RECORD OF BOREHOLE MW-11S

SHEET 1 of 1

PROJECT: Randolph County Landfill
PROJECT NUMBER: 0739-612711.400
DRILLED DEPTH: 25.0 ft
LOCATION: Randleman, NC

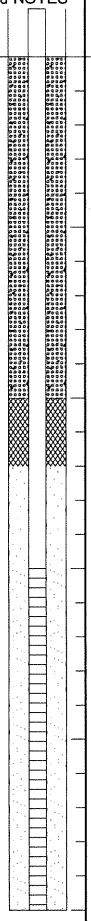
DRILL RIG: Gus Pech Brute
DATE STARTED: 12/1/10
DATE COMPLETED: 12/1/10

NORTHING: 731,567.0
EASTING: 1,774,109.1
GS ELEVATION: 574.9 ft
TOC ELEVATION: 577.7 ft

DEPTH W.L.:14.25
DATE W.L.:12/1/2010
TIME W.L.:13:00

DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	NUMBER	TYPE	BLOWS per 6 in (140 lb hammer 30 inch drop)	N	REC
0		0.0 - 3.0	CL		571.9					
		3.0 - 8.0 Lean CLAY, Trace Fine Sand, Well Graded, Red (Matrix) w/ Brownish Yellow (Features), Medium Plasticity, Moist			3.0		SPT	9-16-24-25	40	2.0/2.0
5	570		CL		566.9					
		8.0 - 13.0 Lean CLAY, Trace to little Silt, Well Graded, Olive (Matrix) w/ Red (Features), Low to Medium Plasticity, Moist			8.0		SPT	4-6-10-19	16	2.0/2.0
10	565		CL		561.9					
		13.0 - 18.0 Clayey SILT, Little Clay, Well Graded, Olive (Matrix) w/ Dark Brown to Black (Features), Low Plasticity, Moist			13.0		SPT	8-14-21-38	35	1.7/2.0
15	560		ML		556.9					
		18.0 - 18.5 Clayey SILT, Little Clay, Well Graded, Olive (Matrix) w/ Dark Brown to Black (Features), Low Plasticity, Moist	ML		556.4					
		18.5 - 25.0 PWR, Silt, Trace Fine Sand, Well Graded, White (Matrix) w/ Reddish Yellow (Features), Low Plasticity, Dry, Retains rock texture	PWR		18.5		SPT	7-12-25-50/4	37	0.8/2.0
20	555									
25	550				549.9					
		Boring completed at 25.0 ft					SPT	15-50/5	50/5	0.5/2.0
30	545									
35	540									
40	535									
45	530									

MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES



WELL CONSTRUCTION DETAILS

WELL CASING
Interval: -2.85'-15'
Material: PVC
Diameter: 2"
Joint Type: Threaded

SURFACE CASING
Interval: N/A
Material: N/A
Diameter: N/A

WELL SCREEN
Interval: 15'-25'
Material: PVC
Diameter: 2"
Slot Size: 0.010"
End Cap: PVC

FILTER PACK
Interval: 12'-25'
Type: #2 Sand

FILTER PACK SEAL
Interval: 10'-12'
Type: 3/8" Bentonite Chips

ANNULUS SEAL
Interval: 0'-10'
Type: Portland/Bentonite Mix

WELL COMPLETION
Pad: 3'x3'x6" Concrete Pad
Protective Casing: 4" Aluminum

DRILLING METHODS
Soil Drill: 6.25" ID HSA
Rock Drill: N/A

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: SAEDACCO
DRILLER: Steve Poloniewcz

GA INSPECTOR: Ben Draper, P.G.
CHECKED BY: David Reedy, P.G.
DATE: 2/14/12

Golder Associates

BOREHOLE RECORD NES WELL INSTALLATION.GPJ PIEDMONT.GDT 4/11/13

RECORD OF BOREHOLE MW-11D

PROJECT: Randolph County Landfill
PROJECT NUMBER: 0739-612711.400
DRILLED DEPTH: 65.0 ft
LOCATION: Randleman, NC

DRILL RIG: Gus Pech Brute
DATE STARTED: 12/2/10
DATE COMPLETED: 12/2/10

NORTHING: 731,020.7
EASTING: 1,774,116.1
GS ELEVATION: 574.6 ft
TOC ELEVATION: 577.6 ft

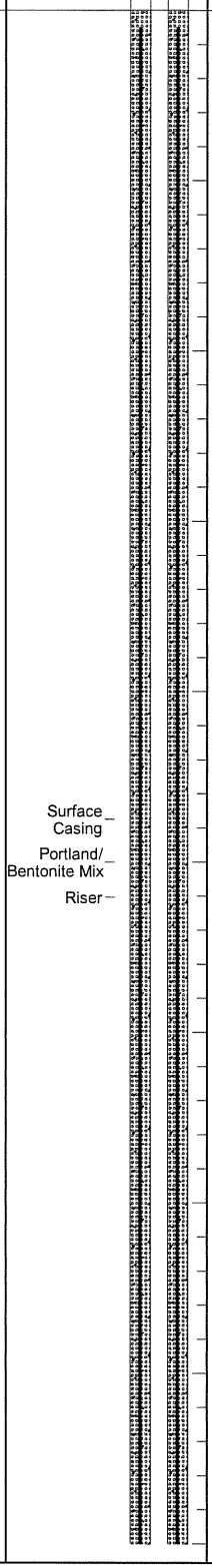
DEPTH W.L.:25.14
DATE W.L.:12/2/2010
TIME W.L.:12:05

DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	USCS	ELEV. / DEPTH (ft)
0		0.0 - 3.0	CL	571.6 / 3.0
5	570	3.0 - 8.0 Lean CLAY, Trace Fine Sand, Well Graded, Red (Matrix) w/ Brownish Yellow (Features), Medium Plasticity, Moist	CL	566.6 / 8.0
10	565	8.0 - 13.0 Lean CLAY, Trace to little Silt, Well Graded, Olive (Matrix) w/ Red (Features), Low to Medium Plasticity, Moist	CL	561.6 / 13.0
15	560	13.0 - 18.0 Clayey SILT, Little Clay, Well Graded, Olive (Matrix) w/ Dark Brown to Black (Features), Low Plasticity, Moist	ML	556.6
		18.0 - 18.5 Clayey SILT, Little Clay, Well Graded, Olive (Matrix) w/ Dark Brown to Black (Features), Low Plasticity, Moist	ML	556.1 / 18.5
20	555	18.5 - 25.0 PWR, Silt, Trace Fine Sand, Well Graded, White (Matrix) w/ Reddish Yellow (Features), Low Plasticity, Dry, Retains rock texture	PWR	549.6 / 25.0
25	550	25.0 - 29.0 PWR, Silt, Trace Fine Sand, Well Graded, White (Matrix) w/ Reddish Yellow (Features), Low Plasticity, Wet cuttings	PWR	545.6
30	545	29.0 - 30.0 Auger Refusal at 30'	PWR	29.0 / 544.6
		30.0 - 40.0 BEDROCK, Argillite (Mudstone) Cuttings	BR	534.6 / 40.0
35	540			
40	535	40.0 - 47.0 BEDROCK, Argillite (Mudstone) Cuttings	BR	
45	530			

Log continued on next page

SAMPLES: NUMBER, TYPE, REC

MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES



WELL CONSTRUCTION DETAILS

WELL CASING
Interval: -2.93'-55'
Material: PVC
Diameter: 2"
Joint Type: Threaded

SURFACE CASING
Interval: 0'-47'
Material: PVC
Diameter: 6"

WELL SCREEN
Interval: 55'-65'
Material: PVC
Diameter: 2"
Slot Size: 0.010"
End Cap: PVC

FILTER PACK
Interval: 53'-65'
Type: #2 Sand

FILTER PACK SEAL
Interval: 50'-53'
Type: 3/8" Bentonite Chips

ANNULUS SEAL
Interval: 0'-50'
Type: Portland/Bentonite Mix

WELL COMPLETION
Pad: 3'x3'x6" Concrete Pad
Protective Casing: 4" Aluminum

DRILLING METHODS
Soil Drill: 8.25" ID HSA
Rock Drill: 7 7/8" Downhole Hammer/ 5 5/8" Downhole Hammer

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: SAEDACCO
DRILLER: Steve Poloniewcz

GA INSPECTOR: Ben Draper, P.G.
CHECKED BY: David Reedy, P.G.
DATE: 2/14/12

Golder Associates

BOREHOLE RECORD NES WELL INSTALLATION.GPJ PIEDMONT.GDT 4/11/13

RECORD OF BOREHOLE MW-11D

SHEET 2 of 2

PROJECT: Randolph County Landfill
PROJECT NUMBER: 0739-612711.400
DRILLED DEPTH: 65.0 ft
LOCATION: Randleman, NC

DRILL RIG: Gus Pech Brute
DATE STARTED: 12/2/10
DATE COMPLETED: 12/2/10

NORTHING: 731,020.7
EASTING: 1,774,116.1
GS ELEVATION: 574.6 ft
TOC ELEVATION: 577.6 ft

DEPTH W.L.:25.14
DATE W.L.:12/2/2010
TIME W.L.:12:05

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE: DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: REC	MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
45		40.0 - 47.0 BEDROCK, Argillite (Mudstone) Cuttings *(Continued)*	BR		527.6					**WELL CASING** Interval: -2.93'-55' Material: PVC Diameter: 2" Joint Type: Threaded
		47.0 - 50.0 BEDROCK, Argillite (Mudstone) Cuttings, White Cuttings, Very Hard	BR		47.0 524.6					**SURFACE CASING** Interval: 0'-47' Material: PVC Diameter: 6"
50	525	50.0 - 55.0 Small Fracture (based on drilling response), Less Dust	BR		50.0 519.6				3/8" Bentonite Chips	**WELL SCREEN** Interval: 55'-65' Material: PVC Diameter: 2" Slot Size: 0.010" End Cap: PVC
55	520	55.0 - 60.0 Fracture, Very little Dust, Large rock fragments come out in cuttings	BR		55.0 514.6				#2 Sand	**FILTER PACK** Interval: 53'-65' Type: #2 Sand
60	515	60.0 - 65.0 Water present in hole, Producing little to no dust, Water begins coming from hole with rock fragments, Small fracture at 63'	BR		60.0 509.6				0.010" Slot Screen	**FILTER PACK SEAL** Interval: 50'-53' Type: 3/8" Bentonite Chips
65	510	Boring completed at 65.0 ft								**ANNULUS SEAL** Interval: 0'-50' Type: Portland/Bentonite Mix
70	505									**WELL COMPLETION** Pad: 3'x3'x6" Concrete Pad Protective Casing: 4" Aluminum
75	500									**DRILLING METHODS** Soil Drill: 8.25" ID HSA Rock Drill: 7 7/8" Downhole Hammer/ 5 5/8" Downhole Hammer
80	495									
85	490									
90	485									

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: SAEDACCO
DRILLER: Steve Poloniewcz

GA INSPECTOR: Ben Draper, P.G.
CHECKED BY: David Reedy, P.G.
DATE: 2/14/12

Golder Associates

BOREHOLE RECORD NES WELL INSTALLATION.GPJ PIEDMONT.GDT 4/11/13

NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2675

1. WELL CONTRACTOR:
Robert Miller
Well Contractor (Individual) Name
SAEDACCO Inc
Well Contractor Company Name
STREET ADDRESS 9000 MARKSWOOD RD
CHARLOTTE | N.C. | 28278
City or Town | State | Zip Code
( )- (704) 634-4589
Area code- Phone number

2. WELL INFORMATION:
SITE WELL ID #(if applicable) MW-10D
STATE WELL PERMIT#(if applicable)
DWQ or OTHER PERMIT #(if applicable)
WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)
DATE DRILLED 12-8-10 & 12-9-10
TIME COMPLETED 10:00 AM ☒ PM ☐

3. WELL LOCATION:
CITY: Randleman COUNTY RANDOLPH
1252 County Land Road
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)
TOPOGRAPHIC / LAND SETTING:
☒ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)
LATITUDE 35.75782
LONGITUDE 79.77238
May be in degrees, minutes, seconds or in a decimal format
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)

4. FACILITY- is the name of the business where the well is located.
FACILITY ID #(if applicable)
NAME OF FACILITY Randolph County Landfill
STREET ADDRESS 1252 County Land Road
Randleman | N.C
City or Town | State | Zip Code
CONTACT PERSON Golder Assciates
MAILING ADDRESS 4900 Koger Boulevard Suite 140
GREENSBORO | N.C. | 27403
City or Town | State | Zip Code
(336)- 852-4903
Area code - Phone number

5. WELL DETAILS:
a. **TOTAL DEPTH:** 73'
b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒
c. **WATER LEVEL** Below Top of Casing: FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 3' 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):
From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0	To 63'	Ft.	2"	SCH40	PVC
From 0	To 55'	Ft.	6"	SCH40	PVC
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0	To 59'	Ft.	PORTLAND	TRIMI
From 0	To 55'	Ft.	PORTLAND	TRIMI
From	To	Ft.		

8. SCREEN:

	Depth		Diameter		Slot Size		Material
From 63'	To 73'	Ft.	2"	in.	.010	in.	PVC
From	To	Ft.		in.		in.	
From	To	Ft.		in.		in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 61'	To 73'	Ft.	20/30	#2 SILICA
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0	30FT	ORANGE SILT
30FT	73FT	ROCK
	73FT	

11. REMARKS:
2' BENTONITE3 SEAL FROM 59' TO 61'

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.

Robert L. Miller — 12-15-10
SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE

ROBERT L. MILLER
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2675

1. WELL CONTRACTOR:
Robert Miller
Well Contractor (Individual) Name
SAEDACCO Inc
Well Contractor Company Name
STREET ADDRESS 9000 MARKSWOOD RD
CHARLOTTE | N.C. | 28278
City or Town | State | Zip Code
( )- (704) 634-4589
Area code- Phone number

2. WELL INFORMATION:
SITE WELL ID #(if applicable) MW-10S
STATE WELL PERMIT#(if applicable)
DWQ or OTHER PERMIT #(if applicable)
WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation☐ Other ☐ (list use)
DATE DRILLED 12-8-10
TIME COMPLETED 2:00 AM ☐ PM ☒

3. WELL LOCATION:
CITY: Randleman COUNTY RANDOLPH
1252 County Land Road
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)
TOPOGRAPHIC / LAND SETTING:
☒ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)
LATITUDE 35.75782
LONGITUDE 79.77238
May be in degrees, minutes, seconds or in a decimal format
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)

4. FACILITY- is the name of the business where the well is located.
FACILITY ID #(if applicable)
NAME OF FACILITY Randolph County Landfill
STREET ADDRESS 1252 County Land Road
Randleman | N.C
City or Town | State | Zip Code
CONTACT PERSON Golder Assciates
MAILING ADDRESS 4900 Koger Boulevard Suite 140
GREENSBORO | N.C. | 27403
City or Town | State | Zip Code
(336)- 852-4903
Area code - Phone number

5. WELL DETAILS:
a. **TOTAL DEPTH:** 25'
b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒
c. **WATER LEVEL** Below Top of Casing: FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 3' 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):
From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0	To 15'	Ft.	2"	SCH40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0	To 11'	Ft.	PORTLAND	POUR
From 0	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter		Slot Size		Material
From 15'	To 25'	Ft.	2"	in.	.010	in.	PVC
From	To	Ft.		in.		in.	
From	To	Ft.		in.		in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 13'	To 25'	Ft.	20/30	#2 SILICA
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0	25FT	ORANGE SILT

11. REMARKS:
2' BENTONITE3 SEAL FROM 11' TO 13'

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.

Robert L. Miller — 12-15-10
SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE

ROBERT L. MILLER
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2284-A

1. WELL CONTRACTOR:
Steve Poloniewicz
Well Contractor (Individual) Name
SAEDACCO Inc
Well Contractor Company Name
STREET ADDRESS 9088 North Field dr
Fort mill | S.C | 29707
City or Town | State | Zip Code
( )- (704) 634-4589
Area code- Phone number

2. WELL INFORMATION:
SITE WELL ID #(if applicable) mw-11S
STATE WELL PERMIT#(if applicable)
DWQ or OTHER PERMIT #(if applicable)
WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)
DATE DRILLED 11-30-2010
TIME COMPLETED 4:00 AM ☐ PM ☒

3. WELL LOCATION:
CITY: Randleman COUNTY RANDOLPH
1252 County Land Road
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)
TOPOGRAPHIC / LAND SETTING:
☒ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)
LATITUDE 35.75782
LONGITUDE 79.77238
May be in degrees, minutes, seconds or in a decimal format
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)

4. FACILITY- is the name of the business where the well is located.
FACILITY ID #(if applicable)
NAME OF FACILITY Randolph County Landfill
STREET ADDRESS 1252 County Land Road
Randleman | N.C |
City or Town | State | Zip Code
CONTACT PERSON Golder Assciates
MAILING ADDRESS 4900 Koger Boulevard Suite 140
GREENSBORO | N.C. | 27403
City or Town | State | Zip Code
(336)- 852-4903
Area code - Phone number

5. WELL DETAILS:
a. **TOTAL DEPTH:** 60'
b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒
c. **WATER LEVEL** Below Top of Casing: FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 3' 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):
From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0	To 15'	Ft.	2"	SCH40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0	To 11'	Ft.	PORTLAND	TRIMI
From 0	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter		Slot Size		Material
From 15'	To 25'	Ft.	2"	in.	.010	in.	PVC
From	To	Ft.		in.		in.	
From	To	Ft.		in.		in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 13'	To 25'	Ft.	20/30	#2 SILICA
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0	5'	ORANGE SILT
5'	25'	orange silt
	25'	

11. REMARKS:
2' BENTONITE3 SEAL FROM 11' TO 13'

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.

SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE: 12-17-2010

STEVE POLONIEWICZ
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2284-A

1. WELL CONTRACTOR:
Steve Poloniewicz
Well Contractor (Individual) Name
SAEDACCO Inc
Well Contractor Company Name
STREET ADDRESS 9088 North Field dr
Fort mill | S.C | 29707
City or Town | State | Zip Code
( )- (704) 634-4589
Area code- Phone number

2. WELL INFORMATION:
SITE WELL ID #(if applicable) mw-11-S
STATE WELL PERMIT#(if applicable)
DWQ or OTHER PERMIT #(if applicable)
WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☐ (list use)
DATE DRILLED 11-30-2010
TIME COMPLETED 10:00 AM ☒ PM ☐

3. WELL LOCATION:
CITY: Randleman COUNTY RANDOLPH
1252 County Land Road
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)
TOPOGRAPHIC / LAND SETTING:
☒ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)
LATITUDE 35.75782
LONGITUDE 79.77238
May be in degrees, minutes, seconds or in a decimal format
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)

4. FACILITY- is the name of the business where the well is located.
FACILITY ID #(if applicable)
NAME OF FACILITY Randolph County Landfill
STREET ADDRESS 1252 County Land Road
Randleman | N.C |
City or Town | State | Zip Code
CONTACT PERSON Golder Assciates
MAILING ADDRESS 4900 Koger Boulevard Suite 140
GREENSBORO | N.C. | 27403
City or Town | State | Zip Code
(336)- 852-4903
Area code - Phone number

5. WELL DETAILS:
a. **TOTAL DEPTH:** 25'
b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒
c. **WATER LEVEL** Below Top of Casing: FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 3' 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):
From To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0	To 15'	Ft.	2"	SCH40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0	To 11'	Ft.	PORTLAND	TRIMI
From 0	To	Ft.		
From	To	Ft.		

8. SCREEN:

	Depth		Diameter		Slot Size		Material
From 15'	To 25'	Ft.	2"	in.	.010	in.	PVC
From	To	Ft.		in.		in.	
From	To	Ft.		in.		in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 13'	To 25'	Ft.	20/30	#2 SILICA
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0	5'	ORANGE SILT
5'	30'	PWR
30'	50'	ROCK
50'	60'	ROCK
	30'	

11. REMARKS:
2' BENTONITE3 SEAL FROM 11' TO 13'

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.

Steve Poloniewicz — 12-17-2010
SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE

STEVE POLONIEWICZ
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

APPENDIX B

WELL DEVELOPMENT LOGS

MONITORING WELL DEVELOPMENT DATA SHEET

Project: Randolph Co.
Date: 2-8-11
Casing Type: PVC
Well/Boring Number MW-10S
Casing Diameter in inches (Dr): 2 in
Screened Interval: 15-25
Riser Elevation:
Total Well Depth (Lw) in feet: 27.55
Depth to Water (Lf) in feet: 12.85
Time of Measurement: 1530

Volume of water in well, using $V=0.041\ (Dr)^2\ (Lw - Lf)$ = 2.39 Gallons

FIELD MEASUREMENT OF PHYSICAL PARAMETERS

	Date	Time	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NMU)	Temp (C)	Water Level (ft)	Volume (gallons)
Before Development	2-8-11	1531	6.39	0.483	135	13.44	12.39	0
After Purging 1 Well Vol		1539	5.98	0.408	>1000	13.42	15.76	2.39
2 Well Vol		1546	5.69	0.395	>1000	13.06	19.11	4.78
3 Well Vol		1554	5.76	0.407	>1000	13.65	dry	7.17
4 Well Vol		1648	6.20	0.452	>1000	12.95	dry	9.56
5 Well Vol	2-9-11	0951	5.72	0.438	578	12.88	16.11	11.95
6 Well Vol		1001	5.80	0.438	635	13.08	17.95	14.34
7 Well Vol		1014	5.89	0.435	355	14.52	18.42	16.73
8 Well Vol		1027	5.83	0.434	512	14.59	18.63	19.12
9 Well Vol		1038	5.83	0.418	261	15.09	19.65	21.52
10 Well Vol		1053	5.78	0.419	169	14.53	19.95	23.90
11 Well Vol		1101	5.78	0.402	193	15.24	21.16	26.29
12 Well Vol		1111	5.74	0.408	157	15.08	21.56	28.68
13 Well Vol		1122	5.81	0.427	38.6	15.36	21.91	31.07

Method of purging (bailer or pump) see notes If pumped, pumping rate: 800 ml/min
Well Purged Dry yes Continuous Recharge yes
Notes concerning condition of well, odors, color, etc.:
bailed on 2-8-11
used Grundfos pump on 2-9-11

Developer's Signature Nathan Rathje Date: 2-9-11

MONITORING WELL DEVELOPMENT DATA SHEET

Project: Randolph Co.
Date: 2-8-11
Casing Type: PVC
Well/Boring Number MW-10D
Casing Diameter in inches (Dr): 2 in
Screened Interval: 68-73
Riser Elevation:
Total Well Depth (Lw) in feet: 75.31
Depth to Water (Lf) in feet: 10.30
Time of Measurement: 1456

Volume of water in well, using $V=0.041\ (Dr)^2\ (Lw - Lf)$ = 10.59 Gallons

FIELD MEASUREMENT OF PHYSICAL PARAMETERS

	Date	Time	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NMU)	Temp (C)	Water Level (ft)	Volume (gallons)
Before Development	2-8-11	1456	6.05	1.958	138	13.88	9.82	0
After Purging 1 Well Vol		1519	6.14	1.922	543	15.44	35.03	10.59
2 Well Vol		1545	5.83	1.938	560	15.21	37.62	21.18
3 Well Vol		1607	6.24	1.906	>1000	15.39	46.46	31.77
4 Well Vol		1628	6.07	1.950	660	15.84	47.72	42.36
5 Well Vol		1651	6.42	1.953	82.1	15.66	51.06	52.95
6 Well Vol		1725	6.12	1.951	30.1	15.92	51.35	63.54
7 Well Vol								
8 Well Vol								
9 Well Vol								
10 Well Vol								

Method of purging (bailer or pump) Grundfos If pumped, pumping rate: 2700 ml/min
Well Purged Dry no Continuous Recharge yes
Notes concerning condition of well, odors, color, etc.:

Developer's Signature Nathan Pettyjo Date: 2-8-11

MONITORING WELL DEVELOPMENT DATA SHEET

Project: Randolph Co.
Date: 2-8-11
Casing Type: PVC
Well/Boring Number MW-11S
Casing Diameter in inches (Dr): 2 in
Screened Interval:
Riser Elevation:
Total Well Depth (Lw) in feet: 27.99
Depth to Water (Lf) in feet: 11.35
Time of Measurement: 1127

Volume of water in well, using $V=0.041\ (Dr)^2(Lw - Lf)$ = 2.71 Gallons

FIELD MEASUREMENT OF PHYSICAL PARAMETERS

	Date	Time	pH (S.U.)	Conduc-tivity (mS/cm)	Turbidity (NMU)	Temp (C)	Water Level (ft)	Volume (gallons)
Before Development	2-8-11	1134	6.04	0.114	>1000	14.31	10.85	0
After Purging 1 Well Vol		1144	5.50	0.113	>1000	15.94	15.33	2.71
2 Well Vol		1155	5.63	0.100	>1000	16.35	16.95	5.42
3 Well Vol		1203	5.64	0.103	>1000	16.16	17.11	8.13
6 Well Vol		1226	5.37	0.098	>1000	16.67	18.18	16.26
9 Well Vol		1243	5.41	0.095	>1000	16.67	18.30	24.39
12 Well Vol		1259	5.44	0.185	>1000	16.25	19.10	32.52
15 Well Vol		1306	5.26	0.178	>1000	16.12	20.85	40.65
18 Well Vol		1317	5.35	0.084	>1000	16.14	22.21	48.78
21 Well Vol		1331	5.25	0.088	735	16.59	22.51	56.91
24 Well Vol		1344	5.43	0.090	559	16.45	22.45	65.04
27 Well Vol		1401	5.52	0.096	417	16.06	22.50	73.17
30 Well Vol		1415	5.54	0.084	120	16.18	22.57	81.30
31 Well Vol		1418	5.40	0.090	11.1	16.36	22.65	84.01

Method of purging (bailer or pump) pump If pumped, pumping rate: 2000 ml/min
Well Purged Dry no Continuous Recharge yes
Notes concerning condition of well, odors, color, etc.:

Developer's Signature Natalie Raby Date: 2-8-11

MONITORING WELL DEVELOPMENT DATA SHEET

Project: Randolph Co.
Date: 2-8-11
Casing Type: PVC
Well/Boring Number MW-11D
Casing Diameter in inches (Dr): 2 in
Screened Interval:
Riser Elevation:
Total Well Depth (Lw) in feet: 68.65
Depth to Water (Lf) in feet: 11.75
Time of Measurement: 0921

Volume of water in well, using $V=0.041\ (Dr)^2\ (Lw - Lf)$ = 9.27 Gallons

FIELD MEASUREMENT OF PHYSICAL PARAMETERS

	Date	Time	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NMU)	Temp (C)	Water Level (ft)	Volume (gallons)
Before Development	2-8-11	0946	6.78	0.240	102	14.25	10.65	0
After Purging 1 Well Vol		1021	6.69	0.240	>1000	15.86	24.11	9.27
2 Well Vol		1034	6.64	0.236	195	15.65	28.75	18.54
3 Well Vol		1050	6.65	0.237	37.8	15.59	32.16	27.81
4 Well Vol		1103	6.61	0.236	13.0	15.57	36.14	37.08
5 Well Vol		1111	6.61	0.237	14.0	15.62	40.02	46.35
6 Well Vol								
7 Well Vol								
8 Well Vol								
9 Well Vol								
10 Well Vol								

Method of purging (bailer or pump) pump If pumped, pumping rate: 2000 ml/min
Well Purged Dry no Continuous Recharge yes
Notes concerning condition of well, odors, color, etc.:
- surged every 5 gallons

Developer's Signature [signature] Date: 2-8-11

APPENDIX C

MONITORING WELL SURVEY

RANDOLPH COUNTY LANDFILL

TOP MONITORING WELL & (GROUND)BOLT IN CONCRETE APRON

NORTH CAROLINA PROFESSIONAL SEAL L-3663 LAND SURVEYOR GLENN L. BROWN

Date; 1/27/2011

Glenn Lee Brown

PROFESSIONAL LAND SURVEYOR NO. L-3663

Note: NCGS NAD 27 & NGVD 29 Information

NCGS NAD 27 Coordinates Were Taken From Prior Survey Of Randolph County Landfill. NGVD 29 Elevations Were Also Based On Prior Survey Of Landfill.

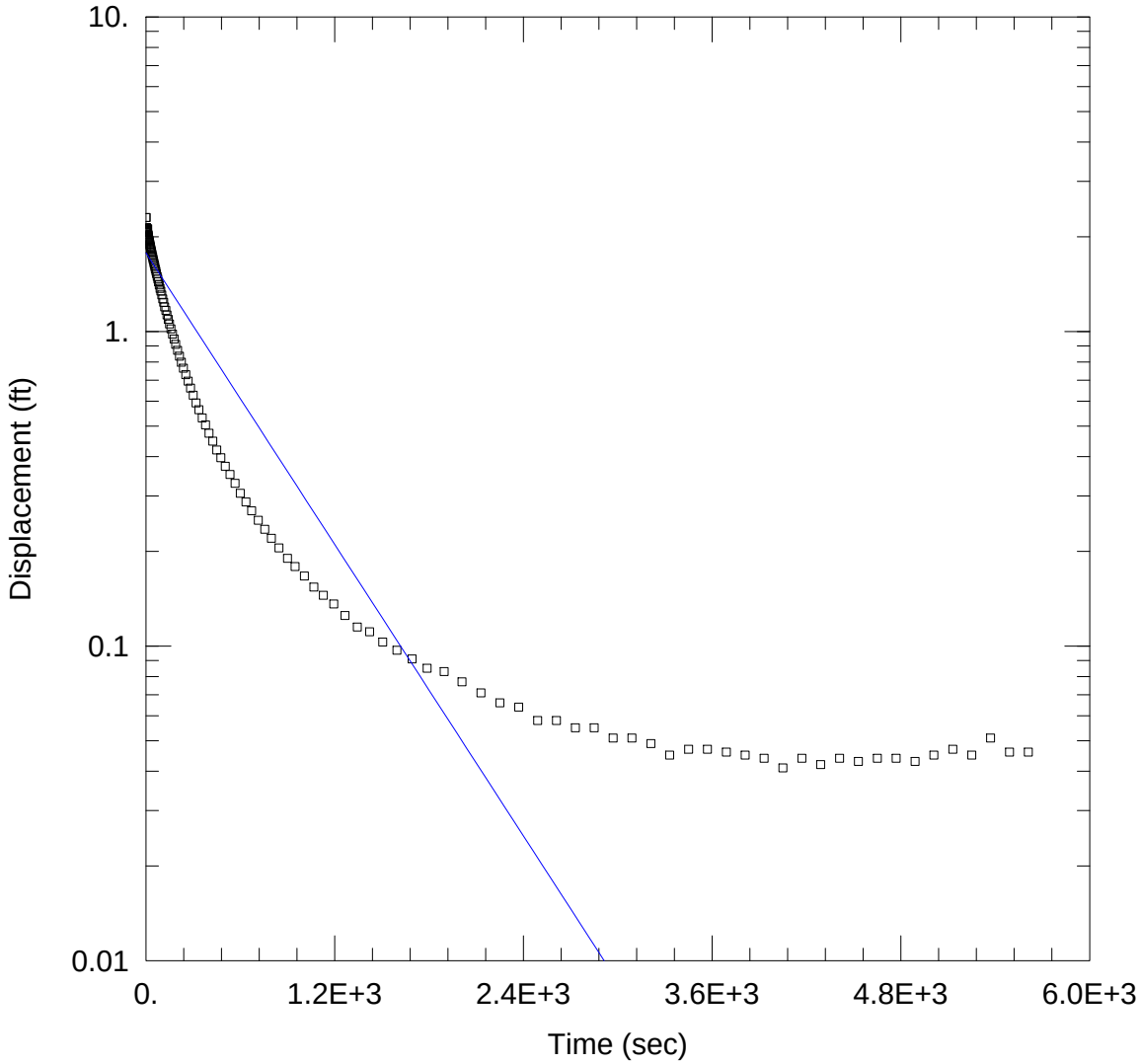
All Monitoring Wells Coordinates And Elevations Are Relative To Existing Monitoring Wells, Concrete Monuments & Points Established In Old Landfill Area.

Job # 2001014GB2

MONITORING WELL #	DESCRIPTION	COORDINATES	ELEVATION
MW-10D New Well @ Old Landfill	*2106* TOP OF P.V.C. PIPE	N = 731,017.2226' E = 1,773,270.3728'	596.80'
	2108 BOLT IN CONCRETE APRON	N = 731,017.4320' E = 1,773,271.4698'	594.56'
MW-10S New Well @ Old Landfill	*2107* TOP OF P.V.C. PIPE	N = 731,020.7602' E = 1,773,274.1958'	596.92'
	2109 BOLT IN CONCRETE APRON	N = 731,020.7205' E = 1,773,273.4952'	594.48'
MW-11D New Well @ Old Landfill	*2100* TOP OF P.V.C. PIPE	N = 731,572.7512' E = 1,774,116.0555'	577.57'
	2102 P.K.NAIL IN CONC. APRON	N = 731,572.6159' E = 1,774,115.1718'	574.64'
MW-11S New Well @ Old Landfill	*2101* TOP OF P.V.C. PIPE	N = 731,567.0194' E = 1,774,109.0630'	577.73'
	2103 BOLT IN CONCRETE APRON	N = 731,566.8100' E = 1,774,108.0249'	574.88'

APPENDIX D

AQUIFER TESTING RESULTS



MW-10D (FALLING HEAD TEST)

Data Set: G:\...\MW-10D Falling Head Test.aqt
Date: 04/11/13 Time: 13:16:45

PROJECT INFORMATION

Company: Golder Associates NC, Inc.
Client: Randolph County
Project: 0739612711.400
Location: Randleman, NC
Test Well: MW-10D (Falling Head Test)
Test Date: 2-14-2011

AQUIFER DATA

Saturated Thickness: 100. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-10D)

Initial Displacement: 2.303 ft
Total Well Penetration Depth: 62.63 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 64.88 ft
Screen Length: 10. ft
Well Radius: 0.08333 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 4.693E-6 ft/sec
y0 = 1.778 ft

Data Set: G:\Projects\Randolph County\Groundwater\Corrective Action\Nature & Extent\Slug Tests\Slug Test Results\MW
Title: MW-10D (Falling Head Test)
Date: 04/11/13
Time: 13:17:19

PROJECT INFORMATION

Company: Golder Associates NC, Inc.
Client: Randolph County
Project: 0739612711.400
Location: Randleman, NC
Test Date: 2-14-2011
Test Well: MW-10D (Falling Head Test)

AQUIFER DATA

Saturated Thickness: 100. ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: MW-10D

X Location: 731017.2226 ft
Y Location: 1773270.373 ft

Initial Displacement: 2.303 ft
Static Water Column Height: 64.88 ft
Casing Radius: 0.08333 ft
Well Radius: 0.08333 ft
Well Skin Radius: 1.042 ft
Screen Length: 10. ft
Total Well Penetration Depth: 62.63 ft
Corrected Casing Radius (Butler Method): 0.1142 ft
Expected Initial Displacement: 5.03 ft

No. of Observations: 152

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
1.259	2.303	150.6	1.056
1.464	1.833	159.6	1.019
2.123	2.138	169.2	0.981
2.328	2.135	178.8	0.947
2.533	2.134	189.6	0.91
2.737	2.129	201.	0.871
3.231	2.127	213.	0.835
3.438	2.135	225.6	0.799
3.684	2.121	238.8	0.764
3.903	2.123	253.2	0.729
4.145	2.115	268.2	0.695
4.363	2.111	283.8	0.661
4.585	2.109	300.6	0.627
4.79	2.106	318.6	0.593
4.995	2.103	337.2	0.564
5.199	2.098	357.6	0.531
5.403	2.096	378.6	0.505
5.607	2.091	400.8	0.475
5.811	2.089	424.8	0.448
6.016	2.089	450.	0.42
6.22	2.084	476.4	0.397
6.425	2.081	504.6	0.373
7.031	2.075	534.6	0.351
7.237	2.074	566.4	0.329
7.561	2.065	600.	0.306
8.181	2.06	636.	0.287
8.461	2.054	672.	0.269
9.083	2.117	714.	0.251
9.511	2.073	756.	0.235
10.08	2.068	798.	0.22
10.68	2.03	846.	0.205
11.28	2.12	900.	0.19
11.94	2.037	948.	0.179

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
12.66	2.027	1008.	0.167
13.44	2.028	1068.	0.154
14.22	2.012	1128.	0.145
15.06	1.995	1194.	0.136
15.96	1.985	1266.	0.125
16.92	1.978	1344.	0.115
17.88	1.963	1422.	0.111
18.96	1.953	1506.	0.103
20.1	1.942	1596.	0.097
21.3	1.93	1692.	0.091
22.56	1.915	1788.	0.085
23.88	1.901	1896.	0.083
25.32	1.889	2010.	0.077
26.82	1.872	2130.	0.071
28.38	1.856	2250.	0.066
30.06	1.841	2370.	0.064
31.86	1.824	2490.	0.058
33.72	1.806	2610.	0.058
35.76	1.787	2730.	0.055
37.86	1.766	2850.	0.055
40.08	1.747	2970.	0.051
42.48	1.726	3090.	0.051
45.	1.703	3210.	0.049
47.66	1.681	3330.	0.045
50.46	1.655	3450.	0.047
53.46	1.632	3570.	0.047
56.64	1.607	3690.	0.046
60.	1.58	3810.	0.045
63.6	1.555	3930.	0.044
67.2	1.527	4050.	0.041
71.4	1.496	4170.	0.044
75.6	1.469	4290.	0.042
79.8	1.439	4410.	0.044
84.6	1.406	4530.	0.043
90.	1.37	4650.	0.044
94.8	1.343	4770.	0.044
100.8	1.307	4890.	0.043
106.8	1.27	5010.	0.045
112.8	1.237	5130.	0.047
119.4	1.197	5250.	0.045
126.6	1.167	5370.	0.051
134.4	1.129	5490.	0.046
142.2	1.093	5610.	0.046

SOLUTION

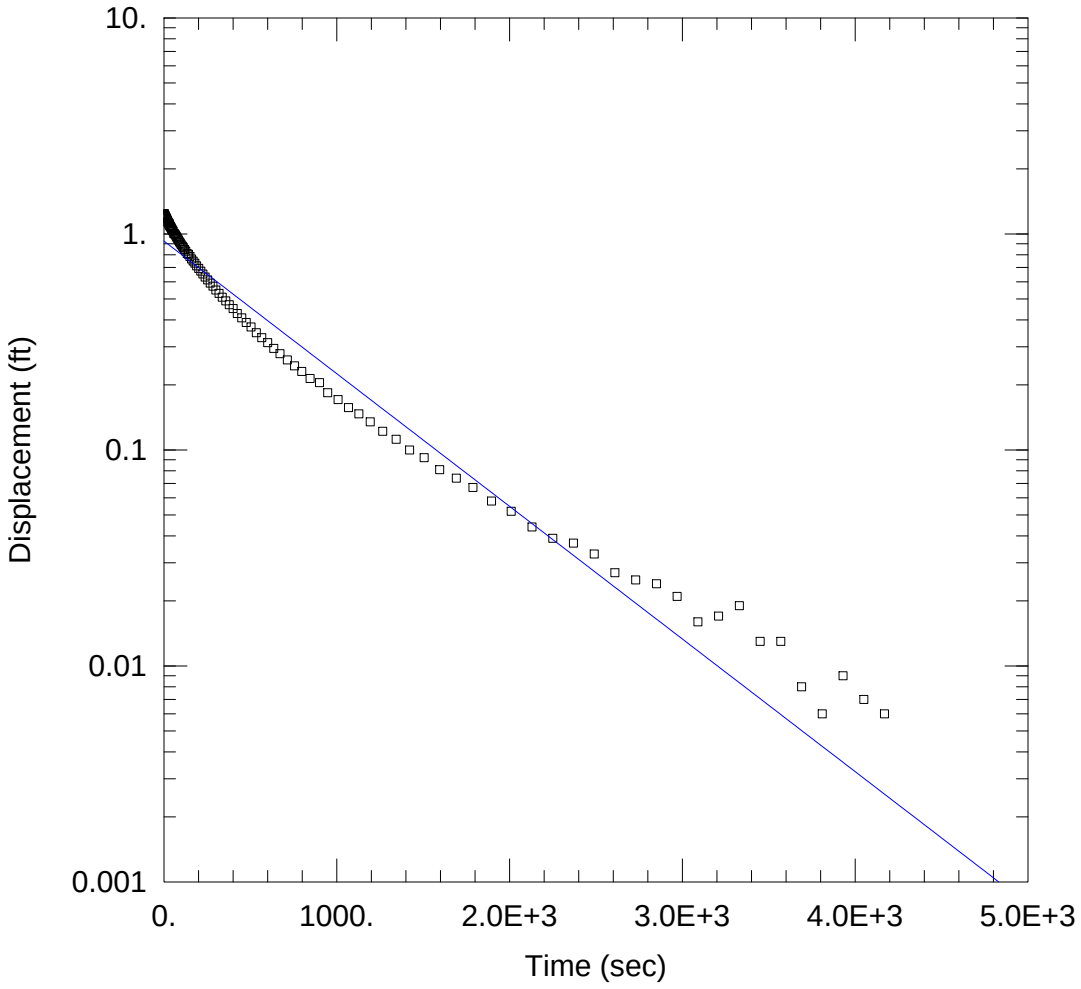
Slug Test
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
ln(Re/rw): 4.05

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	4.693E-6	ft/sec
y0	1.778	ft

K = 0.000143 cm/sec
T = K*b = 0.0004693 ft²/sec (0.436 sq. cm/sec)



MW-10D (RISING HEAD TEST)

Data Set: G:\...\MW-10D Rising Head Test.aqt
Date: 04/11/13 Time: 13:19:07

PROJECT INFORMATION

Company: Golder Associates NC, Inc.
Client: Randolph County
Project: 0739612711.400
Location: Randleman, NC
Test Well: MW-10D (Rising Head Test)
Test Date: 2-14-2011

AQUIFER DATA

Saturated Thickness: 100. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-10D)

Initial Displacement: 1.24 ft
Total Well Penetration Depth: 62.63 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 64.95 ft
Screen Length: 10. ft
Well Radius: 0.08333 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 6.931E-6 ft/sec
y0 = 0.9265 ft

Data Set: G:\Projects\Randolph County\Groundwater\Corrective Action\Nature & Extent\Slug Tests\Slug Test Resu
Title: MW-10D (Rising Head Test)
Date: 04/11/13
Time: 13:19:27

PROJECT INFORMATION

Company: Golder Associates NC, Inc.
Client: Randolph County
Project: 0739612711.400
Location: Randleman, NC
Test Date: 2-14-2011
Test Well: MW-10D (Rising Head Test)

AQUIFER DATA

Saturated Thickness: 100. ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: MW-10D

X Location: 731017.2226 ft
Y Location: 1773270.373 ft

Initial Displacement: 1.24 ft
Static Water Column Height: 64.95 ft
Casing Radius: 0.08333 ft
Well Radius: 0.08333 ft
Well Skin Radius: 0.2604 ft
Screen Length: 10. ft
Total Well Penetration Depth: 62.63 ft
Corrected Casing Radius (Butler Method): 0.1556 ft
Expected Initial Displacement: 5.03 ft

No. of Observations: 144

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.25	1.238	100.8	0.892
0.5	1.234	106.8	0.878
0.75	1.236	112.8	0.864
1.	1.235	119.4	0.847
1.25	1.234	126.6	0.832
1.5	1.233	134.4	0.812
1.75	1.232	142.2	0.805
2.	1.232	150.6	0.785
2.25	1.23	159.6	0.766
2.5	1.191	169.2	0.749
2.75	1.226	178.8	0.732
3.	1.226	189.6	0.712
3.591	1.221	201.	0.693
3.795	1.22	213.	0.673
3.998	1.218	225.6	0.652
4.202	1.216	238.8	0.632
4.867	1.218	253.2	0.612
5.073	1.213	268.2	0.592
5.28	1.208	283.8	0.573
5.844	1.209	300.6	0.55
6.049	1.209	318.6	0.531
6.255	1.21	337.2	0.509
6.475	1.21	357.6	0.49
6.7	1.204	378.6	0.47
6.949	1.207	400.8	0.451
7.17	1.201	424.8	0.428
7.403	1.193	450.	0.409

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
7.942	1.201	476.4	0.389
8.149	1.2	504.6	0.371
8.46	1.189	534.6	0.349
9.102	1.196	566.4	0.331
9.48	1.195	600.	0.314
10.08	1.19	636.	0.295
10.68	1.191	672.	0.279
11.28	1.188	714.	0.261
11.94	1.184	756.	0.245
12.66	1.184	798.	0.231
13.44	1.177	846.	0.214
14.22	1.174	900.	0.205
15.06	1.175	948.	0.184
15.96	1.165	1008.	0.171
16.92	1.163	1068.	0.157
17.88	1.158	1128.	0.147
18.96	1.152	1194.	0.135
20.1	1.149	1266.	0.122
21.3	1.142	1344.	0.112
22.56	1.139	1422.	0.1
23.88	1.132	1506.	0.092
25.32	1.127	1596.	0.081
26.82	1.123	1692.	0.074
28.38	1.115	1788.	0.067
30.06	1.1	1896.	0.058
31.86	1.114	2010.	0.052
33.72	1.094	2130.	0.044
35.76	1.087	2250.	0.039
37.86	1.08	2370.	0.037
40.08	1.074	2490.	0.033
42.48	1.064	2610.	0.027
45.	1.056	2730.	0.025
47.64	1.047	2850.	0.024
50.46	1.037	2970.	0.021
53.46	1.028	3090.	0.016
56.64	1.006	3210.	0.017
60.	1.006	3330.	0.019
63.6	0.996	3450.	0.013
67.2	0.987	3570.	0.013
71.4	0.974	3690.	0.008
75.6	0.961	3810.	0.006
79.8	0.949	3930.	0.009
84.6	0.935	4050.	0.007
90.	0.919	4170.	0.006
94.83	0.907	4290.	0.

SOLUTION

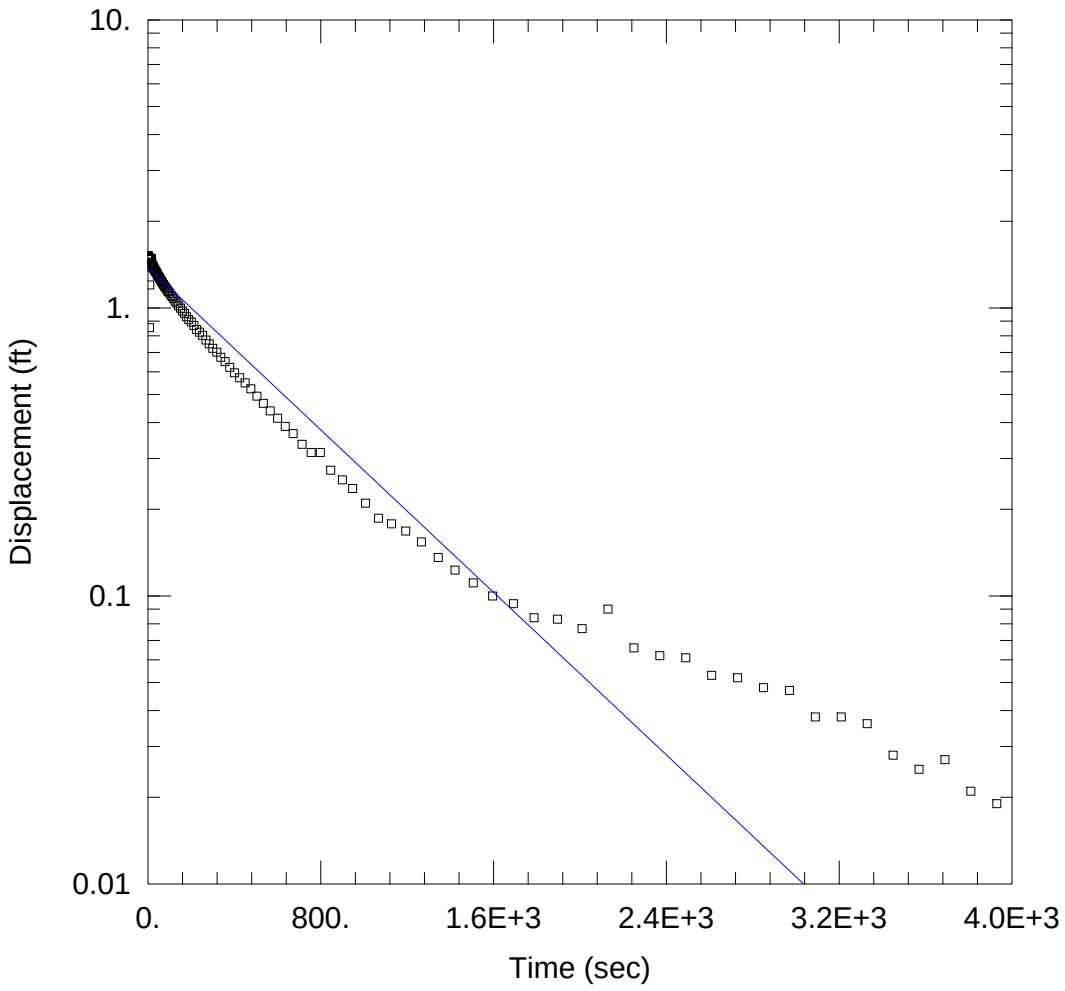
Slug Test
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
ln(Re/rw): 4.05

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	6.931E-6	ft/sec
y0	0.9265	ft

K = 0.0002113 cm/sec
T = K*b = 0.0006931 ft²/sec (0.6439 sq. cm/sec)



MW-10S (FALLING HEAD TEST)

Data Set: G:\...\MW-10S Falling Head Test.aqt
Date: 04/11/13 Time: 13:20:19

PROJECT INFORMATION

Company: Golder Associates NC, Inc.
Client: Randolph County
Project: 0739612711.400
Location: Randleman, NC
Test Well: MW-10S (Falling Head Test)
Test Date: 2-14-2011

AQUIFER DATA

Saturated Thickness: 18.54 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-10S)

Initial Displacement: 1.52 ft
Total Well Penetration Depth: 15. ft
Casing Radius: 0.08333 ft
Static Water Column Height: 14.54 ft
Screen Length: 15. ft
Well Radius: 0.08333 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 4.01E-6 ft/sec y0 = 1.383 ft

Data Set: G:\Projects\Randolph County\Groundwater\Corrective Action\Nature & Extent\Slug Tests\Slug Test Resu
Title: MW-10S (Falling Head Test)
Date: 04/11/13
Time: 13:20:37

PROJECT INFORMATION

Company: Golder Associates NC, Inc.
Client: Randolph County
Project: 0739612711.400
Location: Randleman, NC
Test Date: 2-14-2011
Test Well: MW-10S (Falling Head Test)

AQUIFER DATA

Saturated Thickness: 18.54 ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: MW-10S

X Location: 731020.7602 ft
Y Location: 1773274.196 ft

Initial Displacement: 1.52 ft
Static Water Column Height: 14.54 ft
Casing Radius: 0.08333 ft
Well Radius: 0.08333 ft
Well Skin Radius: 0.2604 ft
Screen Length: 15. ft
Total Well Penetration Depth: 15. ft
Corrected Casing Radius (Butler Method): 0.1405 ft
Expected Initial Displacement: 5.03 ft

No. of Observations: 132

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.247	1.52	119.4	1.076
0.501	1.505	126.6	1.054
0.751	1.515	134.4	1.038
1.438	1.5	142.2	1.018
1.643	1.499	150.6	0.998
1.849	1.501	159.6	0.975
2.057	1.509	169.2	0.957
2.683	1.501	178.8	0.932
2.888	1.496	189.6	0.91
3.093	1.493	201.	0.893
3.706	1.496	213.	0.869
3.91	1.488	225.6	0.841
4.115	1.481	238.8	0.824
4.333	1.494	253.2	0.803
4.581	1.501	268.2	0.774
4.819	1.478	283.8	0.75
5.042	1.482	300.6	0.724
5.248	1.48	318.6	0.702
5.456	1.478	337.2	0.674
5.663	1.478	357.6	0.651
5.867	1.478	378.6	0.622
6.073	1.474	400.8	0.595
7.14	0.854	424.8	0.572
8.461	1.201	450.	0.549
10.18	1.415	476.4	0.524
11.28	1.384	504.6	0.494
11.94	1.475	534.6	0.466

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
12.66	1.435	566.4	0.439
13.44	1.442	600.	0.414
14.22	1.433	636.	0.388
15.06	1.433	672.	0.366
15.96	1.423	714.	0.336
16.92	1.486	756.	0.315
17.88	1.435	798.	0.315
18.96	1.4	846.	0.273
20.1	1.39	900.	0.253
21.3	1.398	948.	0.236
22.56	1.397	1008.	0.21
23.88	1.397	1068.	0.186
25.32	1.379	1128.	0.178
26.82	1.376	1194.	0.168
28.38	1.365	1266.	0.154
30.06	1.363	1344.	0.136
31.86	1.353	1422.	0.123
33.72	1.344	1506.	0.111
35.76	1.336	1596.	0.1
37.86	1.332	1692.	0.094
40.08	1.323	1788.	0.084
42.48	1.311	1896.	0.083
45.	1.298	2010.	0.077
47.64	1.291	2130.	0.09
50.46	1.282	2250.	0.066
53.46	1.269	2370.	0.062
56.64	1.258	2490.	0.061
60.	1.245	2610.	0.053
63.6	1.235	2730.	0.052
67.2	1.222	2850.	0.048
71.4	1.207	2970.	0.047
75.6	1.192	3090.	0.038
79.8	1.182	3210.	0.038
84.6	1.168	3330.	0.036
90.	1.151	3450.	0.028
94.8	1.138	3570.	0.025
100.8	1.126	3690.	0.027
106.8	1.105	3810.	0.021
112.8	1.093	3930.	0.019

SOLUTION

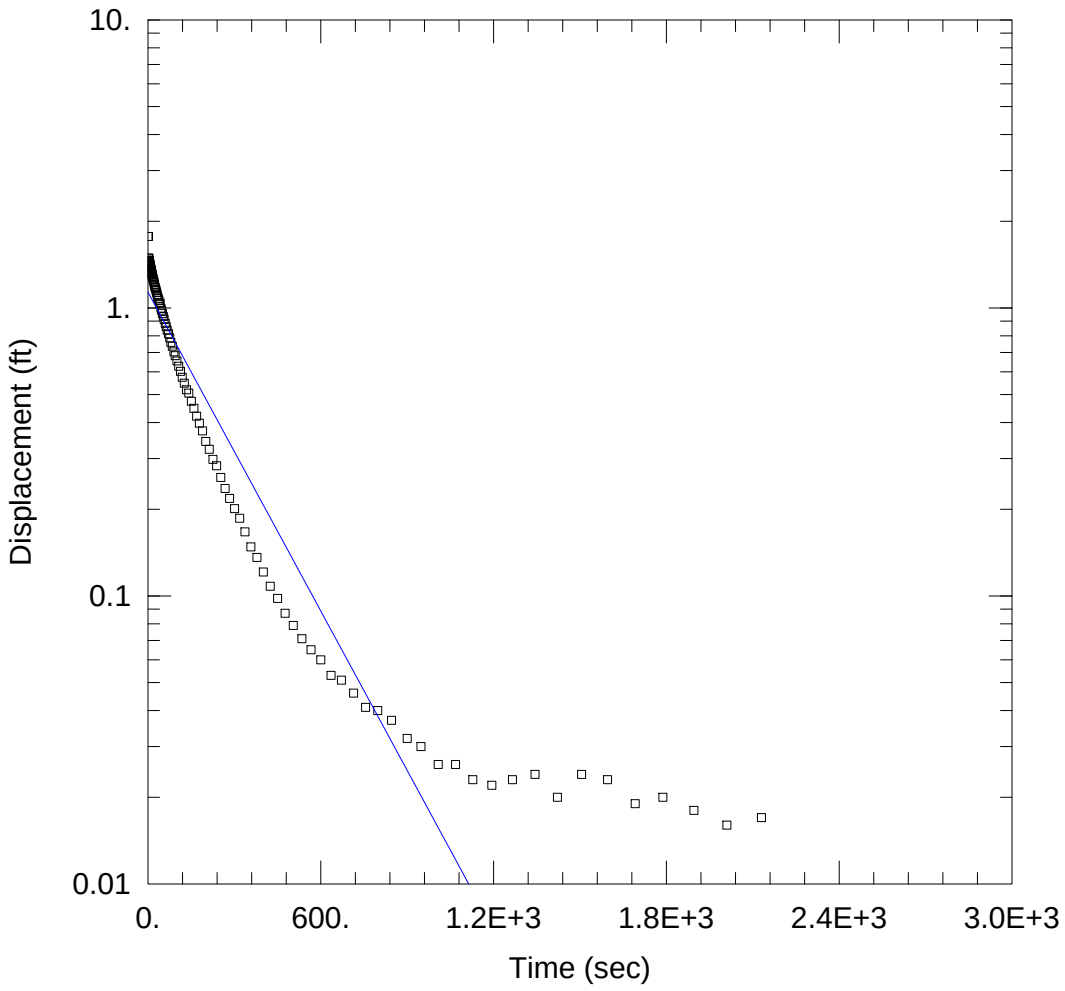
Slug Test
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
ln(Re/rw): 3.751

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	4.01E-6	ft/sec
y0	1.383	ft

K = 0.0001222 cm/sec
T = K*b = 7.435E-5 ft²/sec (0.06907 sq. cm/sec)



MW-11D (FALLING HEAD TEST)

Data Set: G:\...\MW-11D Falling Head Test.aqt
Date: 04/11/13 Time: 13:21:17

PROJECT INFORMATION

Company: Golder Associates NC, Inc.
Client: Randolph County
Project: 0739612711.400
Location: Randleman, NC
Test Well: MW-11D (Falling Head Test)
Test Date: 2-14-2011

AQUIFER DATA

Saturated Thickness: 100. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-11D)

Initial Displacement: 1.771 ft
Total Well Penetration Depth: 56.05 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 56.05 ft
Screen Length: 10. ft
Well Radius: 0.08333 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 5.075E-6 ft/sec
y0 = 1.134 ft

Data Set: G:\Projects\Randolph County\Groundwater\Corrective Action\Nature & Extent\Slug Tests\Slug Test Resu
Title: MW-11D (Falling Head Test)
Date: 04/11/13
Time: 13:21:34

PROJECT INFORMATION

Company: Golder Associates NC, Inc.
Client: Randolph County
Project: 0739612711.400
Location: Randleman, NC
Test Date: 2-14-2011
Test Well: MW-11D (Falling Head Test)

AQUIFER DATA

Saturated Thickness: 100. ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: MW-11D

X Location: 731572.7512 ft
Y Location: 1774166.056 ft

Initial Displacement: 1.771 ft
Static Water Column Height: 56.05 ft
Casing Radius: 0.08333 ft
Well Radius: 0.08333 ft
Well Skin Radius: 0.2604 ft
Screen Length: 10. ft
Total Well Penetration Depth: 56.05 ft
Corrected Casing Radius (Bouwer-Rice Method): 0.07725 ft
Gravel Pack Porosity: 0.

No. of Observations: 121

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
1.839	1.771	71.4	0.813
2.047	1.491	75.6	0.788
2.674	1.427	79.8	0.759
2.879	1.302	84.6	0.736
3.084	1.335	90.	0.704
3.344	1.487	94.8	0.683
3.555	1.461	100.8	0.654
3.759	1.467	106.8	0.627
3.966	1.456	112.8	0.602
4.185	1.462	119.4	0.574
4.416	1.452	126.6	0.548
4.634	1.449	134.4	0.52
4.865	1.459	142.2	0.506
5.499	1.436	150.6	0.474
5.705	1.433	159.6	0.448
5.91	1.424	169.2	0.421
6.552	1.42	178.8	0.398
6.757	1.414	189.6	0.374
6.961	1.411	201.	0.344
7.168	1.408	213.	0.323
7.459	1.399	225.6	0.298
7.666	1.396	238.8	0.283
7.874	1.392	253.2	0.258
8.102	1.396	268.2	0.236
8.461	1.384	283.8	0.218
9.001	1.379	300.6	0.201
9.481	1.369	318.6	0.186

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
10.08	1.363	337.2	0.167
10.68	1.356	357.6	0.148
11.28	1.349	378.6	0.136
11.94	1.338	400.8	0.121
12.66	1.329	424.8	0.108
13.44	1.32	450.	0.098
14.22	1.31	476.4	0.087
15.06	1.299	504.6	0.079
15.96	1.286	534.6	0.071
16.92	1.275	566.4	0.065
17.88	1.261	600.	0.06
18.96	1.251	636.	0.053
20.1	1.237	672.	0.051
21.3	1.225	714.	0.046
22.58	1.207	756.	0.041
23.88	1.193	798.	0.04
25.32	1.177	846.	0.037
26.82	1.162	900.	0.032
28.38	1.147	948.	0.03
30.06	1.132	1008.	0.026
31.86	1.114	1068.	0.026
33.72	1.095	1128.	0.023
35.76	1.079	1194.	0.022
37.86	1.062	1266.	0.023
40.08	1.034	1344.	0.024
42.48	1.041	1422.	0.02
45.	0.998	1506.	0.024
47.64	0.981	1596.	0.023
50.46	0.955	1692.	0.019
53.46	0.934	1788.	0.02
56.64	0.911	1896.	0.018
60.	0.884	2010.	0.016
63.6	0.86	2130.	0.017
67.2	0.837		

SOLUTION

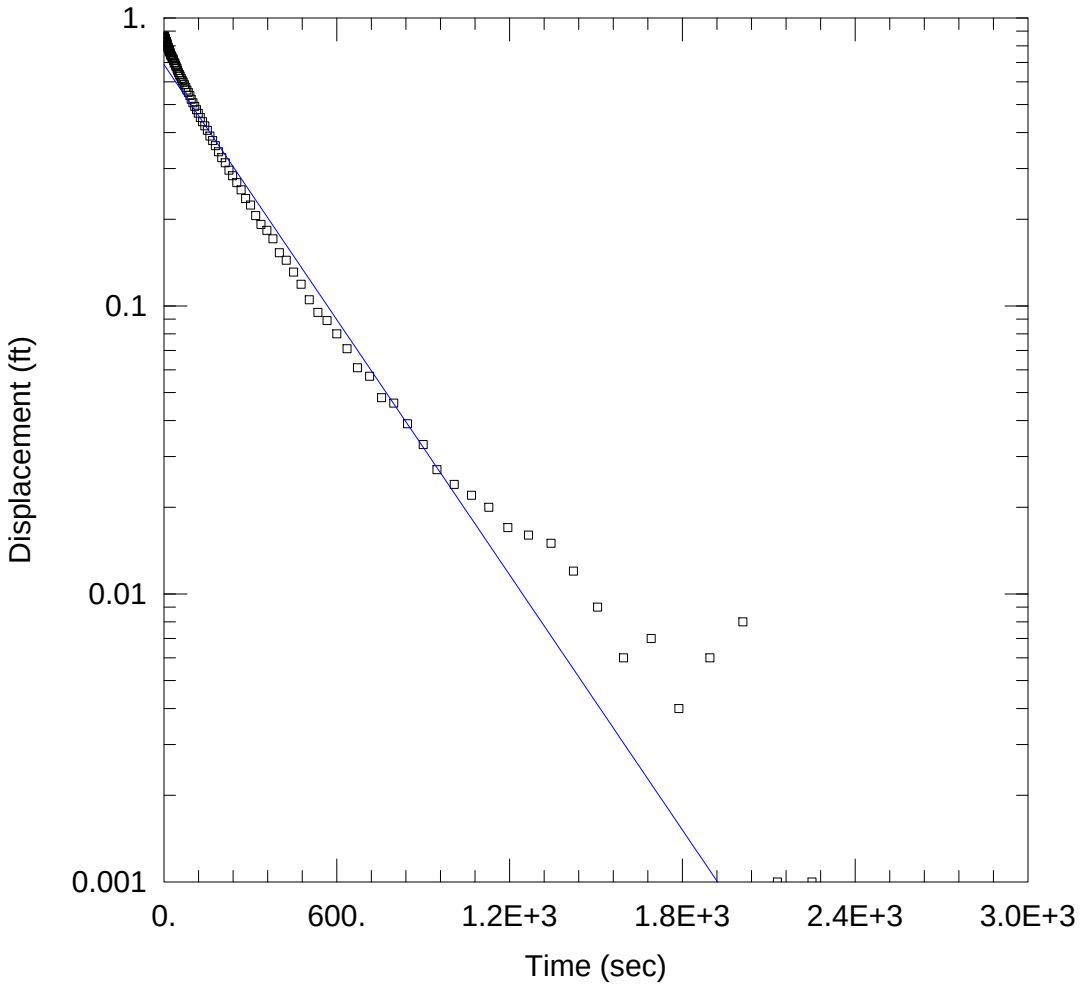
Slug Test
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
ln(Re/rw): 4.004

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	5.075E-6	ft/sec
y0	1.134	ft

K = 0.0001547 cm/sec
T = K*b = 0.0005075 ft²/sec (0.4715 sq. cm/sec)



MW-11D (RISING HEAD TEST)

Data Set: G:\...\MW-11D Rising Head Test.aqt
Date: 04/11/13 Time: 13:22:05

PROJECT INFORMATION

Company: Golder Associates NC, Inc.
Client: Randolph County
Project: 0739612711.400
Location: Randleman, NC
Test Well: MW-11D (Falling Head Test)
Test Date: 2-14-2011

AQUIFER DATA

Saturated Thickness: 100. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-11D)

Initial Displacement: 0.865 ft
Total Well Penetration Depth: 56.05 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 56.05 ft
Screen Length: 10. ft
Well Radius: 0.08333 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 2.362E-5 ft/sec
y0 = 0.6884 ft

Data Set: G:\Projects\Randolph County\Groundwater\Corrective Action\Nature & Extent\Slug Tests\Slug Test Resu
Title: MW-11D (Rising Head Test)
Date: 04/11/13
Time: 13:22:23

PROJECT INFORMATION

Company: Golder Associates NC, Inc.
Client: Randolph County
Project: 0739612711.400
Location: Randleman, NC
Test Date: 2-14-2011
Test Well: MW-11D (Falling Head Test)

AQUIFER DATA

Saturated Thickness: 100. ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: MW-11D

X Location: 731572.7512 ft
Y Location: 1774116.056 ft

Initial Displacement: 0.865 ft
Static Water Column Height: 56.05 ft
Casing Radius: 0.08333 ft
Well Radius: 0.08333 ft
Well Skin Radius: 0.2604 ft
Screen Length: 10. ft
Total Well Penetration Depth: 56.05 ft
Corrected Casing Radius (Butler Method): 0.1863 ft
Expected Initial Displacement: 5.03 ft

No. of Observations: 127

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.251	0.858	63.6	0.606
0.501	0.846	67.2	0.598
1.127	0.856	71.4	0.586
1.332	0.847	75.67	0.574
1.537	0.86	79.8	0.562
2.183	0.865	84.6	0.551
2.387	0.86	90.	0.538
2.592	0.849	94.8	0.522
2.797	0.852	100.8	0.507
3.138	0.852	106.8	0.493
3.405	0.844	112.8	0.48
3.651	0.847	119.4	0.467
3.87	0.845	126.6	0.451
4.102	0.849	134.4	0.436
4.7	0.839	142.2	0.422
4.905	0.836	150.6	0.407
5.11	0.838	159.6	0.389
5.316	0.833	169.2	0.375
5.97	0.83	178.8	0.36
6.175	0.829	189.6	0.343
6.383	0.825	201.	0.327
6.709	0.829	213.	0.314
6.945	0.822	225.6	0.296
7.173	0.828	238.8	0.283
7.378	0.826	253.2	0.268
7.584	0.826	268.2	0.253
7.791	0.826	283.8	0.236

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
8.033	0.826	300.6	0.224
8.239	0.822	318.6	0.206
8.461	0.822	337.2	0.192
9.	0.817	357.6	0.183
9.48	0.816	378.6	0.171
10.08	0.815	400.8	0.153
10.68	0.809	424.8	0.144
11.28	0.805	450.	0.131
11.94	0.803	476.4	0.119
12.66	0.801	504.6	0.105
13.44	0.795	534.6	0.095
14.22	0.79	566.4	0.089
15.06	0.785	600.	0.08
15.96	0.785	636.	0.071
16.92	0.778	672.	0.061
17.88	0.764	714.	0.057
18.96	0.771	756.	0.048
20.1	0.764	798.	0.046
21.3	0.758	846.	0.039
22.56	0.75	900.	0.033
23.88	0.744	948.	0.027
25.32	0.739	1008.	0.024
26.82	0.736	1068.	0.022
28.38	0.727	1128.	0.02
30.06	0.722	1194.	0.017
31.86	0.72	1266.	0.016
33.72	0.711	1344.	0.015
35.76	0.698	1422.	0.012
37.86	0.698	1506.	0.009
40.08	0.684	1596.	0.006
42.48	0.677	1692.	0.007
45.	0.669	1788.	0.004
47.64	0.658	1896.	0.006
50.46	0.646	2010.	0.008
53.46	0.636	2130.	0.001
56.64	0.628	2250.	0.001
60.	0.616		

SOLUTION

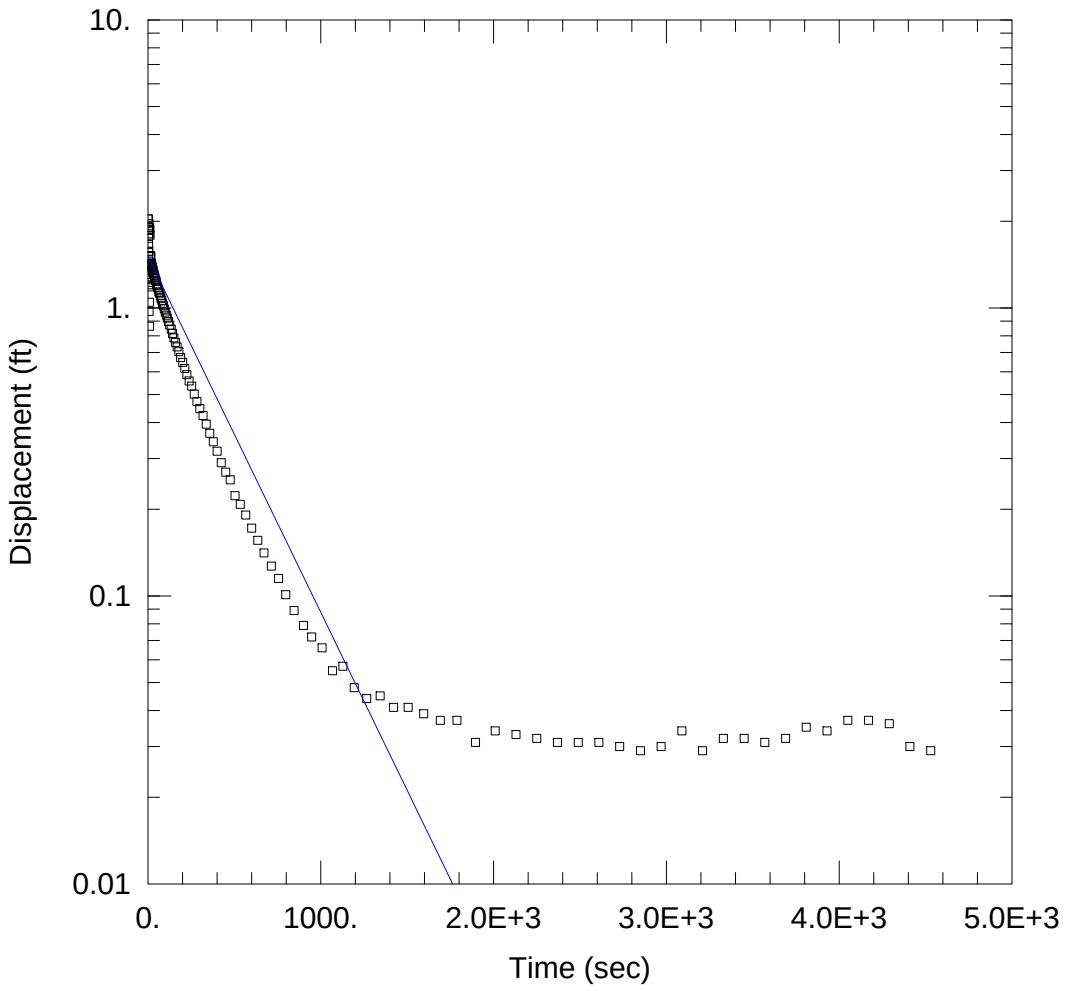
Slug Test
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
ln(Re/rw): 4.004

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	2.362E-5	ft/sec
y0	0.6884	ft

K = 0.0007198 cm/sec
T = K*b = 0.002362 ft²/sec (2.194 sq. cm/sec)



MW-11S (FALLING HEAD TEST)

Data Set: G:\...\MW-11S Falling Head Test.aqt
Date: 04/11/13 Time: 13:22:53

PROJECT INFORMATION

Company: Golder Associates NC, Inc.
Client: Randolph County
Project: 0739612711.400
Location: Randleman, NC
Test Well: MW-11S (Falling Head Test)
Test Date: 2-14-2011

AQUIFER DATA

Saturated Thickness: 18.66 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-11S)

Initial Displacement: 2.038 ft
Total Well Penetration Depth: 16.78 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 16.78 ft
Screen Length: 10. ft
Well Radius: 0.08333 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 7.797E-6 ft/sec y0 = 1.509 ft

Data Set: G:\Projects\Randolph County\Groundwater\Corrective Action\Nature & Extent\Slug Tests\Slug Test Resu
Title: MW-11S (Falling Head Test)
Date: 04/11/13
Time: 13:23:11

PROJECT INFORMATION

Company: Golder Associates NC, Inc.
Client: Randolph County
Project: 0739612711.400
Location: Randleman, NC
Test Date: 2-14-2011
Test Well: MW-11S (Falling Head Test)

AQUIFER DATA

Saturated Thickness: 18.66 ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: MW-11S

X Location: 731567.0194 ft
Y Location: 1774109.063 ft

Initial Displacement: 2.038 ft
Static Water Column Height: 16.78 ft
Casing Radius: 0.08333 ft
Well Radius: 0.08333 ft
Well Skin Radius: 0.2604 ft
Screen Length: 10. ft
Total Well Penetration Depth: 16.78 ft
Corrected Casing Radius (Butler Method): 0.1214 ft
Expected Initial Displacement: 5.03 ft

No. of Observations: 135

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
2.837	2.038	150.6	0.787
3.041	1.744	159.6	0.759
3.479	1.407	169.2	0.732
3.683	1.567	178.8	0.705
3.887	1.454	189.6	0.672
4.091	1.661	201.	0.647
4.318	1.859	213.	0.616
4.538	1.9	225.6	0.586
4.762	1.876	238.8	0.558
4.967	1.574	253.2	0.535
5.174	1.203	268.2	0.502
5.394	1.225	283.8	0.473
5.628	1.268	300.6	0.447
5.849	1.511	318.6	0.423
6.053	1.962	337.2	0.395
6.721	1.412	357.6	0.367
7.141	0.973	378.6	0.343
7.561	1.271	400.8	0.318
7.981	1.809	424.8	0.29
9.208	1.047	450.	0.269
9.481	0.864	476.4	0.253
10.31	1.875	504.6	0.223
10.68	1.902	534.6	0.208
11.28	1.252	566.4	0.191
11.94	1.183	600.	0.172
12.66	1.788	636.	0.156
13.44	1.372	672.	0.141

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
14.22	1.424	714.	0.127
15.06	1.521	756.	0.115
15.96	1.387	798.	0.101
16.92	1.506	846.	0.089
17.88	1.434	900.	0.079
18.96	1.421	948.	0.072
20.1	1.407	1008.	0.066
21.3	1.423	1068.	0.055
22.56	1.383	1128.	0.057
23.88	1.393	1194.	0.048
25.32	1.381	1266.	0.044
26.82	1.363	1344.	0.045
28.38	1.357	1422.	0.041
30.06	1.351	1506.	0.041
31.86	1.322	1596.	0.039
33.72	1.315	1692.	0.037
35.76	1.302	1788.	0.037
37.86	1.29	1896.	0.031
40.08	1.277	2010.	0.034
42.48	1.259	2130.	0.033
45.	1.244	2250.	0.032
47.64	1.237	2370.	0.031
50.46	1.213	2490.	0.031
53.46	1.193	2610.	0.031
56.64	1.177	2730.	0.03
60.	1.159	2850.	0.029
63.6	1.135	2970.	0.03
67.2	1.125	3090.	0.034
71.4	1.102	3210.	0.029
75.6	1.081	3330.	0.032
79.83	1.062	3450.	0.032
84.6	1.038	3570.	0.031
90.	1.017	3690.	0.032
94.8	0.992	3810.	0.035
100.8	0.967	3930.	0.034
106.8	0.943	4050.	0.037
112.8	0.922	4170.	0.037
119.4	0.896	4290.	0.036
126.6	0.871	4410.	0.03
134.4	0.844	4530.	0.029
142.2	0.815		

SOLUTION

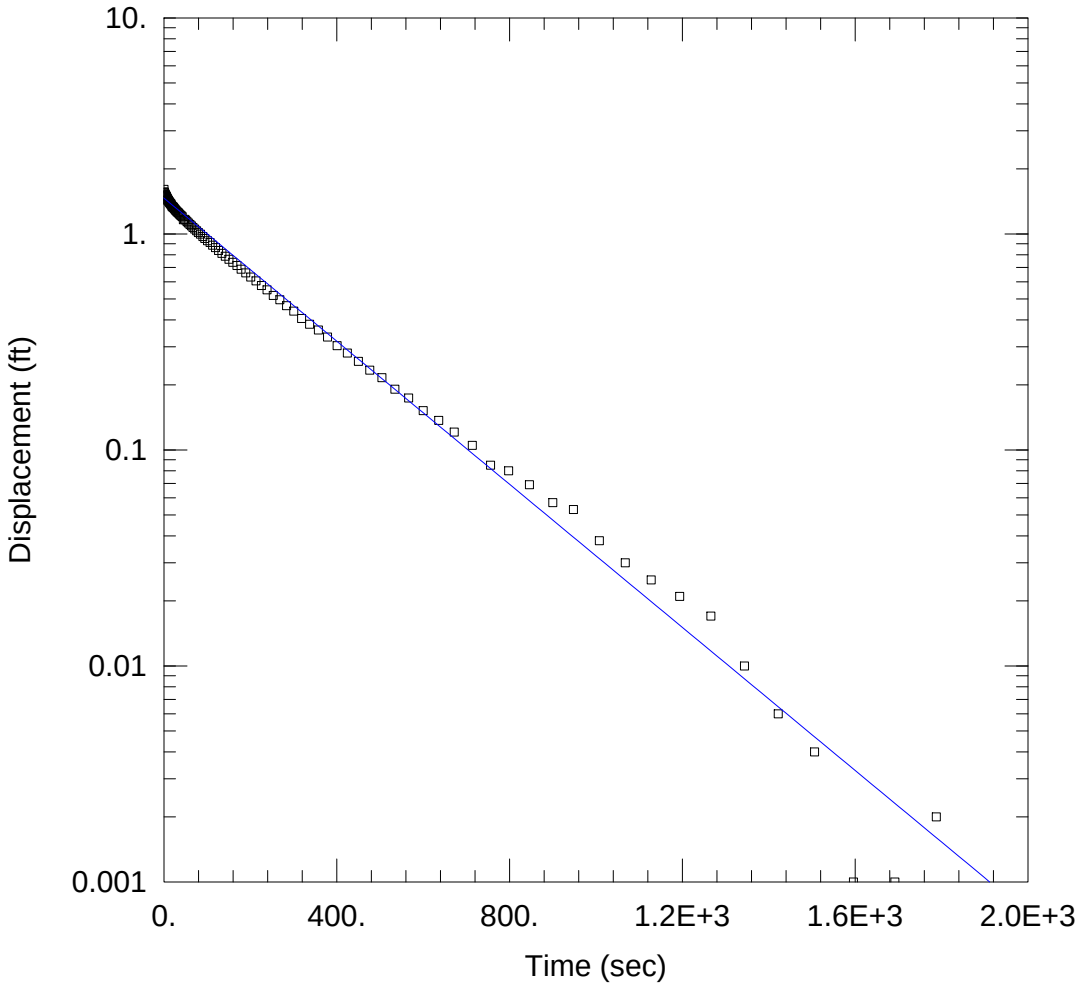
Slug Test
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
ln(Re/rw): 3.721

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	7.797E-6	ft/sec
y0	1.509	ft

K = 0.0002376 cm/sec
T = K*b = 0.0001455 ft²/sec (0.1352 sq. cm/sec)



MW-11S (RISING HEAD TEST)

Data Set: G:\...\MW-11S Rising Head Test.aqt
Date: 04/11/13 Time: 13:23:42

PROJECT INFORMATION

Company: Golder Associates NC, Inc.
Client: Randolph County
Project: 0739612711.400
Location: Randleman, NC
Test Well: MW-11S (Rising Head Test)
Test Date: 2-14-2011

AQUIFER DATA

Saturated Thickness: 18.93 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-11S)

Initial Displacement: 1.608 ft
Total Well Penetration Depth: 16.78 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 16.78 ft
Screen Length: 10. ft
Well Radius: 0.08333 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 1.32E-5 ft/sec
y0 = 1.465 ft

Data Set: G:\Projects\Randolph County\Groundwater\Corrective Action\Nature & Extent\Slug Tests\Slug Test Resu
Title: MW-11S (Rising Head Test)
Date: 04/11/13
Time: 13:23:56

PROJECT INFORMATION

Company: Golder Associates NC, Inc.
Client: Randolph County
Project: 0739612711.400
Location: Randleman, NC
Test Date: 2-14-2011
Test Well: MW-11S (Rising Head Test)

AQUIFER DATA

Saturated Thickness: 18.93 ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: MW-11S

X Location: 731567.0194 ft
Y Location: 1774109.063 ft

Initial Displacement: 1.608 ft
Static Water Column Height: 16.78 ft
Casing Radius: 0.08333 ft
Well Radius: 0.08333 ft
Well Skin Radius: 0.2604 ft
Screen Length: 10. ft
Total Well Penetration Depth: 16.78 ft
Corrected Casing Radius (Butler Method): 0.1366 ft
Expected Initial Displacement: 5.03 ft

No. of Observations: 124

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.25	1.564	56.64	1.124
0.5	1.525	60.	1.107
1.144	1.552	63.6	1.09
1.348	1.56	67.2	1.071
1.553	1.547	71.4	1.053
1.764	1.508	75.6	1.034
2.388	1.519	79.8	1.015
2.592	1.527	84.6	0.997
2.798	1.529	90.	0.973
3.323	1.503	94.8	0.953
3.528	1.499	100.8	0.93
3.736	1.502	106.8	0.913
3.947	1.503	112.8	0.886
4.157	1.506	119.4	0.864
4.378	1.502	126.6	0.838
4.603	1.492	134.4	0.813
4.872	1.482	142.2	0.788
5.096	1.487	150.6	0.763
5.317	1.485	159.6	0.739
5.521	1.486	169.2	0.714
5.728	1.481	178.8	0.686
6.343	1.468	189.6	0.66
6.548	1.465	201.	0.632
6.753	1.466	213.	0.606
6.959	1.457	225.6	0.577
7.613	1.454	238.8	0.551
7.819	1.451	253.2	0.519

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
8.029	1.444	268.2	0.496
8.537	1.439	283.8	0.465
8.745	1.432	300.6	0.439
9.	1.441	318.6	0.406
9.48	1.433	337.2	0.382
10.08	1.429	357.6	0.359
10.68	1.424	378.6	0.333
11.28	1.414	400.8	0.304
11.94	1.409	424.8	0.281
12.66	1.404	450.	0.257
13.44	1.397	476.4	0.234
14.22	1.389	504.6	0.216
15.09	1.38	534.6	0.191
15.96	1.379	566.4	0.174
16.92	1.366	600.	0.152
17.88	1.357	636.	0.137
18.96	1.336	672.	0.121
20.1	1.338	714.	0.105
21.3	1.334	756.	0.085
22.56	1.323	798.	0.08
23.88	1.313	846.	0.069
25.32	1.301	900.	0.057
26.82	1.291	948.	0.053
28.38	1.282	1008.	0.038
30.06	1.267	1068.	0.03
31.86	1.259	1128.	0.025
33.72	1.249	1194.	0.021
35.76	1.237	1266.	0.017
37.86	1.224	1344.	0.01
40.08	1.213	1422.	0.006
42.48	1.201	1506.	0.004
45.	1.162	1596.	0.001
47.64	1.169	1692.	0.001
50.46	1.158	1788.	0.002
53.46	1.14	1896.	0.

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
ln(Re/rw): 3.708

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	1.32E-5	ft/sec
y0	1.465	ft

K = 0.0004023 cm/sec
T = K*b = 0.0002499 ft²/sec (0.2321 sq. cm/sec)

APPENDIX E

APRIL 2011 WATER QUALITY FIELD DATA SHEETS

DATE: 4/12/11

GROUNDWATER SAMPLING LOG

Project Name: Randolph County
Project No./Phase No.: 0739612710.500
Well ID: MW-1
Sampler(s): N. Rathjen
Well Diameter: 2 inches
Initial Depth to Water: 15.61 feet
Depth to Bottom: 26.36 feet
Water Column Thickness: 10.75 feet
Pumping Rate: 200 mL/min.
System Volume: 500 mL
Well Location: located off perimeter rd, NW of closed LF
Equipment: YSI 556, QED MP-15, Water Level Meter, Dedicated Bladder Pump
Hanna Turbidimeter

Time	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	Dis O_2 (mg/L)	Temp. (°C)	ORP (millivolts)	DTW (feet)
1553	5.93	2.055	36.7	0.99	17.22	-19.1	16.39
1556	5.76	1.315	24.4	0.72	16.70	-17.1	16.50
1559	5.74	1.115	10.7	0.66	16.52	-16.9	16.61
1602	5.69	0.999	4.63	0.62	16.37	-16.8	16.65
1605	5.67	0.802	4.01	0.56	16.34	-14.5	16.32
1608	5.68	0.948	3.34	0.56	16.72	-13.0	16.72
1611	5.67	0.942	2.67	0.50	16.31	-13.6	16.74
	Sampled @ 1611						

Comments (weather conditions, color, type of sample, purge-water management, etc.):
Weather - overcast, 60s, slight breeze

Signature: Matt Rath
Date: 4/12/11

QA/QC Sign Off: Renee Win
Date: 5/31/11

DATE: 4/11/11

GROUNDWATER SAMPLING LOG

Project Name: Randolph County
Project No./Phase No.: 0739612710.500
Well ID: MW-5
Sampler(s): N. Rathjen
Well Diameter: 2 inches
Initial Depth to Water: 61.45 feet
Depth to Bottom: 70.30 feet
Water Column Thickness: 8.85 feet
Pumping Rate: 150 mL/min.
System Volume: 500 mL
Well Location: along access road on W side of LF
Equipment: YSI 556, QED MP-15, Water Level Meter, Dedicated Bladder Pump
Hanna Turbidimeter

Time	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	Dis O_2 (mg/L)	Temp. (°C)	ORP (millivolts)	DTW (feet)
1020	6.62	0.892	7.12	3.47	16.74	156.5	63.11
1024	6.62	0.893	6.93	2.73	16.68	154.1	63.38
1028	6.62	0.887	6.25	2.61	16.64	151.9	63.99
1032	6.63	0.884	4.39	2.69	16.62	150.2	64.29
	Sampled @ 1032						

Comments (weather conditions, color, type of sample, purge-water management, etc.):
Weather - overcast, 60s, humid, calm

Signature: Nate Rath **Date:** 4/11/11

QA/QC Sign Off: Mark Min **Date:** 5/31/11

DATE: 4/13/11

GROUNDWATER SAMPLING LOG

Project Name: Randolph County
Project No./Phase No.: 0739612710.500
Well ID: MW-6
Sampler(s): N. Rathjen
Well Diameter: 2 inches
Initial Depth to Water: 10.55 feet
Depth to Bottom: 19.37 feet
Water Column Thickness: 8.82 feet
Pumping Rate: 200 mL/min.
System Volume: 500 mL
Well Location: along access road on W side of LF
Equipment: YSI 556, QED MP-15, Water Level Meter, Dedicated Bladder Pump
Hanna Turbidimeter

Time	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	Dis O_2 (mg/L)	Temp. (°C)	ORP (millivolts)	DTW (feet)
0944	5.17	0.093	72.9	5.42	12.87	210.6	12.16
0947	5.16	0.095	43.9	4.87	12.81	216.1	12.34
0950	5.14	0.094	32.4	4.89	12.75	218.4	12.65
0953	5.13	0.094	25.3	4.95	12.82	219.8	13.11
	Sampled @ 0953						

Comments (weather conditions, color, type of sample, purge-water management, etc.):
Weather - slight breeze, clear, 50s

Signature: [signature] **Date:** 4/13/11

QA/QC Sign Off: [signature] **Date:** 5/31/11

DATE: 4/12/11

GROUNDWATER SAMPLING LOG

Project Name: Randolph County
Project No./Phase No.: 0739612710.500
Well ID: MW-7
Sampler(s): N. Rathjen
Well Diameter: 2 inches
Initial Depth to Water: 18.38 feet
Depth to Bottom: 27.00 feet
Water Column Thickness: 8.62 feet
Pumping Rate: 150 mL/min.
System Volume: 500 mL
Well Location: N side of LF next to access rd
Equipment: YSI 556, QED MP-15, Water Level Meter, Dedicated Bladder Pump
Hanna Turbidimeter

Time	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	Dis O_2 (mg/L)	Temp. (°C)	ORP (millivolts)	DTW (feet)
1346	4.70	0.111	75.7	1.37	16.51	201.3	19.25
1350	4.59	0.108	34.8	1.24	16.48	230.4	19.34
1354	4.60	0.110	29.8	1.18	16.57	240.8	19.38
1358	4.61	0.112	16.7	1.10	16.42	238.4	19.43
	Sampled @ 1358						

Comments (weather conditions, color, type of sample, purge-water management, etc.):
Weather - windy, partly cloudy, 60s

Signature: Matt Rathjen **Date:** 4/12/11

QA/QC Sign Off: Maeve Kain **Date:** 5/31/11

DATE: 4/12/11

GROUNDWATER SAMPLING LOG

Project Name:	Randolph County	**Project No./Phase No.:**	0739612710.500
Well ID:	MW-8	**Sampler(s):**	N. Rathjen
Well Diameter:	2 inches	**Initial Depth to Water:**	10.81 feet
Depth to Bottom:	30.00 feet	**Water Column Thickness:**	19.19 feet
Pumping Rate:	200 mL/min.	**System Volume:**	500 mL
Well Location:	located downhill of perimeter rd		
Equipment:	YSI 556, QED MP-15, Water Level Meter, Dedicated Bladder Pump		
	Hanna Turbidimeter		

Time	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	Dis O_2 (mg/L)	Temp. (°C)	ORP (millivolts)	DTW (feet)
1208	5.83	0.216	~~243~~ 243	4.90	14.89	167.9	13.51
1211	5.79	0.214	41.3	4.36	14.98	167.7	13.02
1214	5.80	0.214	39.8	4.18	14.90	166.5	13.61
1217	5.80	0.214	34.7	4.24	14.68	166.7	13.86
	Sampled @ 1217						

Comments (weather conditions, color, type of sample, purge-water management, etc.):
Weather - slight breeze, 60s, overcast

Signature: Natt Rathjen **Date:** 4/12/11

QA/QC Sign Off: Mennd Tin **Date:** 5/31/11

DATE: 4/12/11

GROUNDWATER SAMPLING LOG

Project Name: Randolph County
Project No./Phase No.: 0739612710.500
Well ID: MW-9
Sampler(s): N. Rathjen,
Well Diameter: 2 inches
Initial Depth to Water: 17.81 feet
Depth to Bottom: 35.10 feet
Water Column Thickness: 17.29 feet
Pumping Rate: 200 mL/min.
System Volume: 500 mL
Well Location: East side of LF along bottom of hill
Equipment: YSI 556, QED MP-15, Water Level Meter, Dedicated Bladder Pump
Hanna Turbidimeter

Time	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	Dis O_2 (mg/L)	Temp. (°C)	ORP (millivolts)	DTW (feet)
0953	5.85	0.478	23.5	7.04	16.26	185.1	18.67
1004	5.90	0.482	7.84	5.84	15.78	181.5	18.91
1007	5.81	0.480	5.01	4.47	15.50	183.9	19.09
1010	5.73	0.479	3.19	2.87	15.46	186.0	19.17
1013	5.73	0.479	2.79	2.49	15.43	186.1	19.27
1016	5.73	0.478	2.30	2.18	15.36	185.8	19.34
1018	5.73	0.477	2.56	1.97	15.38	186.3	19.39
1021	5.73	0.475	1.90	1.85	15.39	186.1	19.41
1024	5.74	0.474	1.58	1.73	15.38	186.1	19.45
1027	5.75	0.473	1.42	1.55	15.41	185.3	19.46
1030	5.75	0.470	1.39	1.49	15.38	185.2	19.53
1033	5.81	0.468	2.43	1.52	15.37	181.7	19.67
	Sampled @ 1033						

* adjusted tubing

Comments (weather conditions, color, type of sample, purge-water management, etc.):
Weather- overcast, slight breeze, 60s

Signature: Matt Rathjen **Date:** 4/12/11

QA/QC Sign Off: Rachel Tarr **Date:** 5/31/11

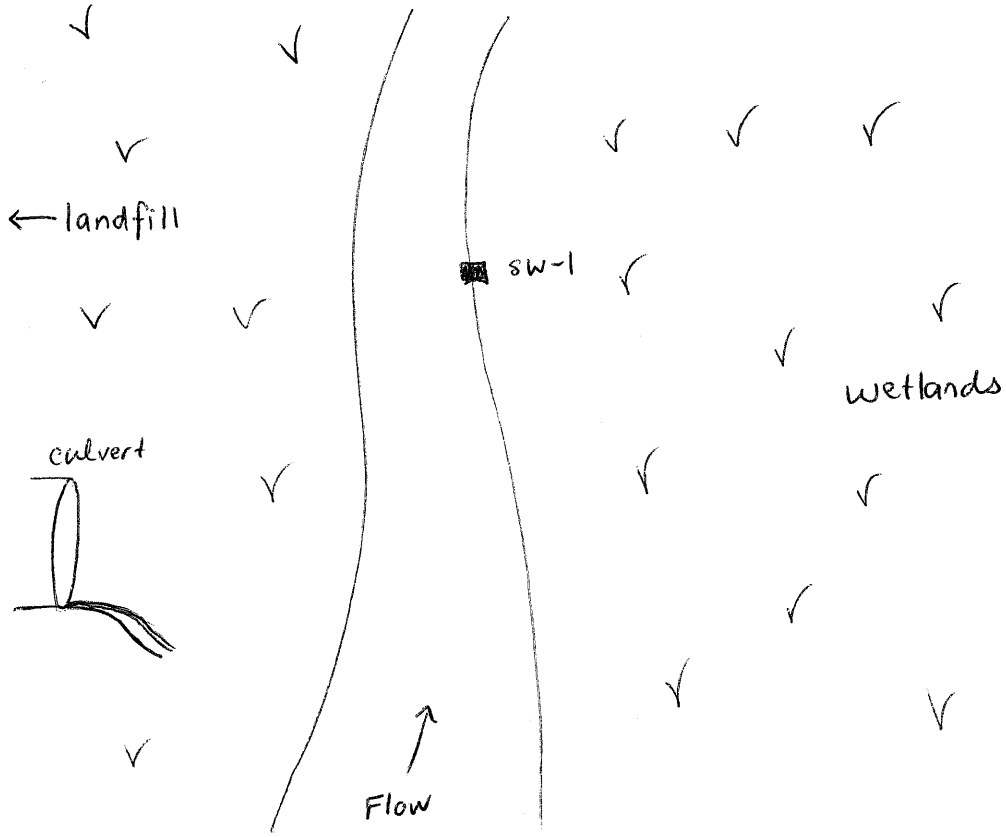
DATE: 4-12-11

SURFACE WATER SAMPLING LOG

Project Name: Randolph Co. **Project No./Phase No.:** 0739612710
Sample ID: SW-1 **Sampler(s):** N.Rathjen/K.Brewer
Sampling Location: E of LF near MW-8, downstream of culvert
Equipment: YSI 556, Hanna Turbidimeter

Time	1303
pH s.u.	6.92
Cond. mS/cm	0.145
Turb. ntu	21.8
Dis. O_2 mg/L	8.91
Temp. °C	17.37
ORP mv	44.2

Surface Water Sampling Location Sketch



Comments (sample methodology, weather conditions, color, silt, etc.):
Weather- mostly cloudy, 60s, breezy

Signature: [signature] **Date:** 4-12-11

QA/QC Sign Off: [signature] **Date:** 5-31-11

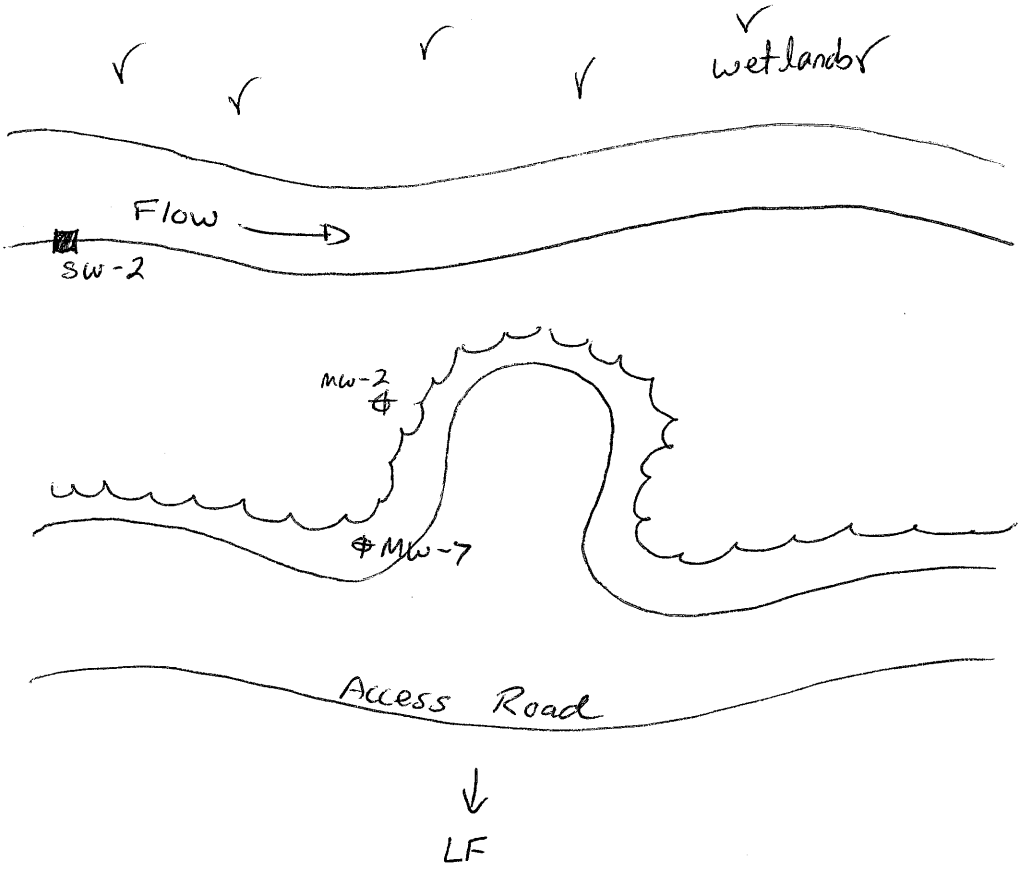
DATE: 4-12-11

SURFACE WATER SAMPLING LOG

Project Name: Randolph Co. **Project No./Phase No.:** 0739612710
Sample ID: SW-2 **Sampler(s):** N.Rathjen/K.Brewer
Sampling Location: NL of LF, in wetlands near MW-7
Equipment: YSI 556, Hanna Turbidimeter

Time	1521
pH s.u.	6.24
Cond. mS/cm	0.204
Turb. ntu	11.5
Dis. O_2 mg/L	8.33
Temp. °C	18.37
ORP mv	237.6

Surface Water Sampling Location Sketch



Comments (sample methodology, weather conditions, color, silt, etc.):
Weather- Partly cloudy, 60s, breezy

Signature: [signature] **Date:** 4-12-11

QA/QC Sign Off: [signature] **Date:** 5-31-11

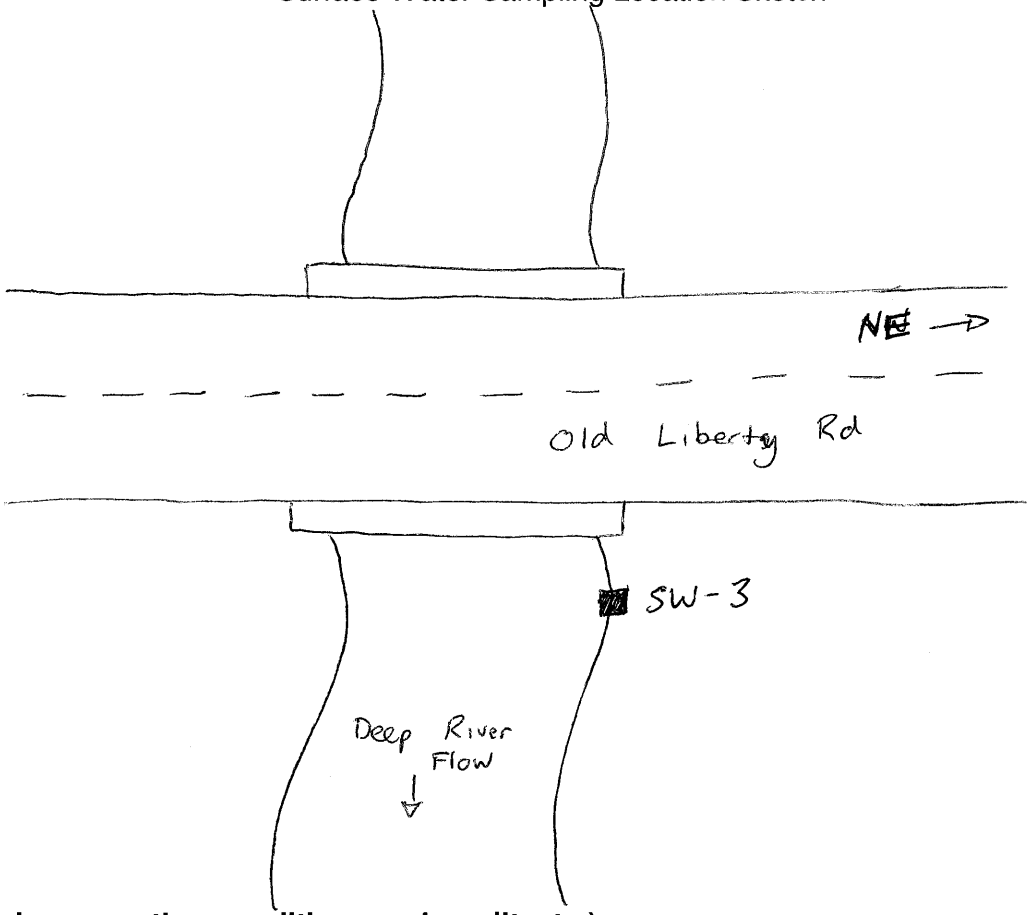
DATE: 4-13-11

SURFACE WATER SAMPLING LOG

Project Name: Randolph Co. **Project No./Phase No.:** 0739612710
Sample ID: SW-3 **Sampler(s):** N.Rathjen/K.Brewer
Sampling Location: Under Liberty Rd bridge along Deep River
Equipment: YSI 556, Hanna Turbidimeter

Time	1503
pH s.u.	6.68
Cond. mS/cm	0.220
Turb. ntu	19.8
Dis. O_2 mg/L	8.41
Temp. °C	15.26
ORP mv	188.7

Surface Water Sampling Location Sketch



Comments (sample methodology, weather conditions, color, silt, etc.):
Weather - 60's, clear, slight breeze

Signature: Nath Rath **Date:** 4-13-11

QA/QC Sign Off: Reviewed Jcw **Date:** 5-31-11

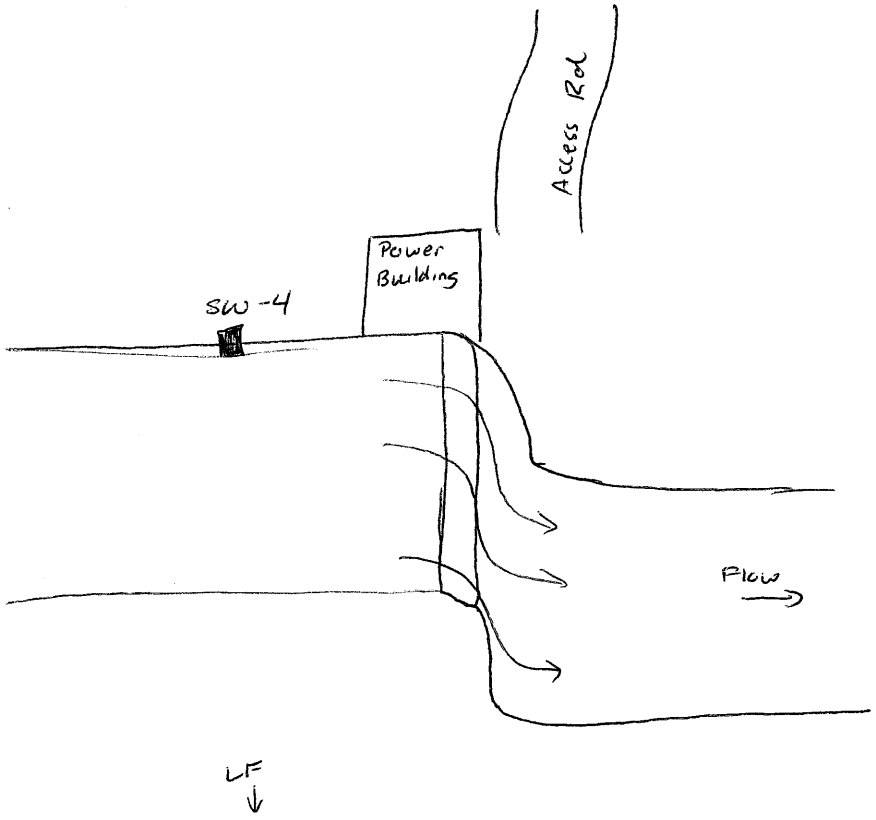
DATE: 4-13-11

SURFACE WATER SAMPLING LOG

Project Name: Randolph Co. **Project No./Phase No.:** 0739612710
Sample ID: SW-4 **Sampler(s):** N.Rathjen/K.Brewer
Sampling Location: located near dam, NE of LF
Equipment: YSI 556, Hanna Turbidimeter

Time	1445
pH s.u.	6.02
Cond. mS/cm	0.215
Turb. ntu	36.3
Dis. O_2 mg/L	9.50
Temp. °C	16.97
ORP mv	154.9

Surface Water Sampling Location Sketch



Comments (sample methodology, weather conditions, color, silt, etc.):
Weather - 60s, clear, slight breeze

Signature: [signature] **Date:** 4-13-11

QA/QC Sign Off: [signature] **Date:** 5-31-11

DATE: 4/13/11

GROUNDWATER SAMPLING LOG

Project Name: Randolph County
Project No./Phase No.: 0739612710.500
Well ID: MW-2
Sampler(s): N. Rathjen
Well Diameter: 2 inches
Initial Depth to Water: 15.15 feet
Depth to Bottom: 35.00 feet
Water Column Thickness: feet
Pumping Rate: 200 mL/min.
System Volume: 500 mL
Well Location:
Equipment: YSI 556, QED MP-15, Water Level Meter, Dedicated Bladder Pump
Hanna Turbidimeter

Time	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	Dis O_2 (mg/L)	Temp. (°C)	ORP (millivolts)	DTW (feet)
1257	4.60	0.134	205	1.79	15.84	213.7	16.49
1300	4.57	0.134	200	1.33	15.82	220.4	16.51
1303	4.57	0.134	157	1.06	15.68	224.8	16.53
1306	4.57	0.134	134	0.95	15.43	228.5	16.57
1309	4.53	0.133	106	0.78	15.48	233.8	16.61
1312	4.52	0.132	91.4	0.97	15.45	236.6	16.62
	Sampled @ 1312						

Comments (weather conditions, color, type of sample, purge-water management, etc.):
Weather – clear, calm, 60s

Signature: Natt Rath **Date:** 4/13/11

QA/QC Sign Off: Hannah Hain **Date:** 5/31/11

DATE: 4/11/11

GROUNDWATER SAMPLING LOG

Project Name: Randolph County
Project No./Phase No.: 0739612710.500
Well ID: MW-105
Sampler(s): N. Rathjen
Well Diameter: 2 inches
Initial Depth to Water: 11.99 feet
Depth to Bottom: 27.55 feet
Water Column Thickness: feet
Pumping Rate: 200 mL/min.
System Volume: 500 mL
Well Location:
Equipment: YSI 556, QED MP-15, Water Level Meter, Dedicated Bladder Pump
Hanna Turbidimeter

Time	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	Dis O_2 (mg/L)	Temp. (°C)	ORP (millivolts)	DTW (feet)
1459	5.63	0.267	4.10	4.06	16.80	141.5	12.82
1502	5.49	0.266	3.92	2.43	15.93	161.7	12.89
1505	5.47	0.266	5.29	2.03	15.89	160.7	13.04
1508	5.46	0.266	4.79	1.94	15.79	157.9	13.12
1511	5.45	0.266	7.08	1.73	15.63	158.5	13.25
1514	5.46	0.267	6.99	1.72	15.41	157.9	13.30
1517	5.45	0.267	5.35	1.67	15.38	157.8	13.36
	Sampled @ 1517						

Comments (weather conditions, color, type of sample, purge-water management, etc.):
Weather - partly cloudy, 70s, slight breeze

Signature: Nate Rath **Date:** 4/11/11

QA/QC Sign Off: Rachel Tunnell **Date:** 5/31/11

DATE: 4/11/11

GROUNDWATER SAMPLING LOG

Project Name: Randolph County
Project No./Phase No.: 0739612710.500
Well ID: MW-10D
Sampler(s): N. Rathjen
Well Diameter: 2 inches
Initial Depth to Water: 9.11 feet
Depth to Bottom: 75.31 feet
Water Column Thickness: feet
Pumping Rate: 200 mL/min.
System Volume: 500 mL
Well Location:
Equipment: YSI 556, QED MP-15, Water Level Meter, Dedicated Bladder Pump
Hanna Turbidimeter

Time	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	Dis O_2 (mg/L)	Temp. (°C)	ORP (millivolts)	DTW (feet)
1600	6.39	1.663	20.9	4.64	15.94	144.2	10.36
1603	6.36	1.667	19.8	3.54	15.87	136.8	10.66
1606	6.35	1.665	23.6	3.28	15.80	131.6	10.75
1609	6.35	1.665	21.7	3.12	16.01	119.5	10.82
1612	6.35	1.665	19.9	3.20	15.97	119.1	10.93
	Sampled @ 1612						

Comments (weather conditions, color, type of sample, purge-water management, etc.):
Weather - partly cloudy, 70s, slight breeze

Signature: [signature] **Date:** 4/11/11

QA/QC Sign Off: [signature] **Date:** 5/31/11

DATE: 4/11/11

GROUNDWATER SAMPLING LOG

Project Name: Randolph County
Project No./Phase No.: 0739612710.500
Well ID: MW-11S
Sampler(s): N. Rathjen
Well Diameter: 2 inches
Initial Depth to Water: 9.84 feet
Depth to Bottom: 27.99 feet
Water Column Thickness: feet
Pumping Rate: 200 mL/min.
System Volume: 500 mL
Well Location:
Equipment: YSI 556, QED MP-15, Water Level Meter, Dedicated Bladder Pump
Hanna Turbidimeter

Time	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	Dis O_2 (mg/L)	Temp. (°C)	ORP (millivolts)	DTW (feet)
1347	5.58	0.078	6.92	4.76	17.16	134.3	10.46
1350	5.51	0.072	4.07	2.97	17.03	159.3	10.54
1353	5.15	0.071	2.64	2.53	16.95	168.1	10.57
1356	5.11	0.071	~~2.32~~ 1.85 NR	2.32	16.70	172.0	10.62
1359	5.07	0.070	2.23	2.10	16.36	178.6	10.56
1402	5.08	0.071	2.74	2.07	16.99	185.0	10.54
1405	5.08	0.071	2.76	2.07	16.86	179.3	10.55
	Sampled @ 1405						

Comments (weather conditions, color, type of sample, purge-water management, etc.):
Weather- partly cloudy, 70s, calm

Signature: Natt Rath **Date:** 4/11/11

QA/QC Sign Off: Laurel Nair **Date:** 5/31/11

DATE: 4/11/11

GROUNDWATER SAMPLING LOG

Project Name: Randolph County
Project No./Phase No.: 0739612710.500
Well ID: MW-11D
Sampler(s): N. Rathjen
Well Diameter: 2 inches
Initial Depth to Water: 10.84 feet
Depth to Bottom: 68.65 feet
Water Column Thickness: feet
Pumping Rate: 200 mL/min.
System Volume: 500 mL
Well Location:
Equipment: YSI 556, QED MP-15, Water Level Meter, Dedicated Bladder Pump
Hanna Turbidimeter

Time	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	Dis O_2 (mg/L)	Temp. (°C)	ORP (millivolts)	DTW (feet)
1238	6.93	0.228	6.72	4.46	16.38	71.3	11.90
1241	6.70	0.224	7.96	3.68	16.43	78.4	12.04
1244	6.64	0.221	9.91	3.48	16.35	83.1	12.11
1247	6.60	0.220	7.47	3.25	16.35	93.0	12.22
1250	6.58	0.219	8.14	3.08	16.48	91.5	12.32
1253	6.57	0.219	10.3	3.01	16.35	92.3	12.40
	Sampled @ 1253						

Comments (weather conditions, color, type of sample, purge-water management, etc.):
Weather - partly cloudy, calm, 60s

Signature: Natalie Rathjen **Date:** 4/11/11

QA/QC Sign Off: Renee Nair **Date:** 5/31/11

APPENDIX F

APRIL 2011 WATER QUALITY MONITORING CERTIFICATES-OF ANALYSIS, CHAIN-OF-CUSTODY FORMS, AND DATA REVIEWS

Environmental Conservation Laboratories, Inc.
102-A Woodwinds Industrial Court
Cary NC, 27511
Phone: 919.467.3090 FAX: 919.467.3515

www.encolabs.com

Wednesday, April 27, 2011

Golder Associates, Inc. (GO007)

Attn: Dusty Reedy

5B Oak Branch Drive

Greensboro, NC 27407

RE: Laboratory Results for
Project Number: 073-9612711.500, Project Name/Desc: Randolph County LF
ENCO Workorder: C104061

Dear Dusty Reedy,

Enclosed is a copy of your laboratory report for test samples received by our laboratory on Tuesday, April 12, 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,

Stephanie Franz

Project Manager

Enclosure(s)

The total number of pages in this report, including this page is 97.

www.encolabs.com

PROJECT NARRATIVE

Date: 27 April 2011
Client: Golder Associates, Inc. (GO007)
Project: Randolph County LF
Lab ID: C104061, C104568, C104671

Overview

Environmental Conservation Laboratories, Inc. (ENCO) analyzed all submitted samples in accordance with the methods referenced in the laboratory report. Any particular difficulties encountered during sample handling by ENCO are discussed in the QC Remarks section below.

Quality Control Samples

Chloride and Nitrite were detected in their respective Method Blanks at low-level concentrations (less than half of the MRL). Detections of these analytes should be considered to have a possible high bias if the concentration in the associated sample is not greater than ten times that of the detection in the Method Blank. The spike recoveries of Alkalinity, Nitrate/Nitrite (NOx), Nitrite, Sulfate, and Sulfide were outside of control limits for the MS and/or MSD samples. The QC batches were approved based on acceptable LCS recovery of these analytes.

The spike recovery of Carbon Dioxide was outside of control limits for the RSK-175 MS sample. The QC batch was approved based on acceptable LCS recovery of this analyte.

The spike recoveries of Calcium and Magnesium were outside of control limits for the 6010C MS, MSD, and/or Post spike samples. The QC batches were approved based on acceptable LCS recovery of these analytes.

Quality Control Remarks

No Comments

Other Comments

All samples scheduled to be received under this project arrived in acceptable conditions. The samples were not checked for residual chlorine, as it is not required.

The analytical data presented in this report are consistent with the methods as referenced in the analytical report. Any exceptions or deviations are noted in the QC remarks section of this narrative or in the Flags/Notes and Definitions section of the report.

Released By:
Environmental Conservation Laboratories, Inc.

Stephanie Franz
Project Manager

www.encolabs.com

SAMPLE SUMMARY/LABORATORY CHRONICLE

Client ID: 7601-MW5	Lab ID: C104061-01	Sampled: 04/11/11 10:32	Received: 04/12/11 13:00

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 300.0	05/09/11	04/13/11 21:07	4/13/2011 21:07
EPA 353.2	04/13/11 10:32	04/12/11 12:06	4/12/2011 17:13
EPA 353.2	05/09/11	04/17/11 17:04	4/17/2011 19:57
EPA 353.2	01/04/14	04/18/11 05:32	4/18/2011 13:39
EPA 6010C	10/08/11	04/13/11 10:02	4/14/2011 12:24
RSK-175	04/18/11	04/15/11 09:27	4/18/2011 11:31
SM18 4500-S D	04/18/11	04/15/11 13:23	4/15/2011 14:17
SM18 5310B	05/09/11	04/22/11 13:45	4/22/2011 14:24
VGC-13	04/25/11	04/13/11 13:17	4/13/2011 18:19

Client ID: 7601-MW5	Lab ID: C104061-01RE2	Sampled: 04/11/11 10:32	Received: 04/12/11 13:00

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 310.2	04/25/11	04/19/11 08:47	4/19/2011 10:58

Client ID: 7601-MW10S	Lab ID: C104061-02	Sampled: 04/11/11 15:17	Received: 04/12/11 13:00

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 300.0	05/09/11	04/13/11 21:45	4/13/2011 21:45
EPA 310.2	04/25/11	04/19/11 08:47	4/19/2011 10:05
EPA 353.2	04/13/11 15:17	04/12/11 12:06	4/12/2011 17:15
EPA 353.2	05/09/11	04/17/11 17:04	4/17/2011 19:59
EPA 353.2	01/04/14	04/18/11 05:32	4/18/2011 13:39
EPA 6010C	10/08/11	04/13/11 10:02	4/14/2011 12:26
EPA 8260B	04/25/11	04/14/11 12:16	4/14/2011 23:53
RSK-175	04/18/11	04/15/11 09:27	4/18/2011 11:35
SM18 4500-S D	04/18/11	04/15/11 13:23	4/15/2011 14:17
SM18 5310B	05/09/11	04/22/11 13:45	4/22/2011 14:24
VGC-13	04/25/11	04/13/11 13:17	4/13/2011 19:22

Client ID: 7601-MW10D	Lab ID: C104061-03	Sampled: 04/11/11 16:12	Received: 04/12/11 13:00

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 300.0	05/09/11	04/13/11 22:03	4/13/2011 22:03
EPA 353.2	04/13/11 16:12	04/12/11 12:06	4/12/2011 17:16
EPA 353.2	05/09/11	04/17/11 17:04	4/17/2011 20:02
EPA 353.2	01/04/14	04/18/11 05:32	4/18/2011 13:39
EPA 6010C	10/08/11	04/13/11 10:02	4/14/2011 12:29
EPA 8260B	04/25/11	04/14/11 12:16	4/15/2011 00:22
RSK-175	04/18/11	04/15/11 09:27	4/18/2011 11:39
SM18 4500-S D	04/18/11	04/15/11 13:23	4/15/2011 14:17
SM18 5310B	05/09/11	04/22/11 13:45	4/22/2011 14:24
VGC-13	04/25/11	04/13/11 13:17	4/13/2011 20:24

Client ID:	7601-MW10D	Lab ID:	C104061-03RE1	Sampled:	04/11/11 16:12	Received:	04/12/11 13:00

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 310.2	04/25/11	04/19/11 08:47	4/19/2011 10:33

Client ID:	7601-MW10D	Lab ID:	C104061-03RE2	Sampled:	04/11/11 16:12	Received:	04/12/11 13:00

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 300.0	05/09/11	04/14/11 10:37	4/14/2011 10:37

Client ID:	7601-MW11S	Lab ID:	C104061-04	Sampled:	04/11/11 14:05	Received:	04/12/11 13:00

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 300.0	05/09/11	04/13/11 22:41	4/13/2011 22:41
EPA 310.2	04/25/11	04/19/11 08:47	4/19/2011 10:07
EPA 353.2	04/13/11 14:05	04/12/11 12:06	4/12/2011 17:17
EPA 353.2	05/09/11	04/17/11 17:04	4/17/2011 20:04
EPA 353.2	01/04/14	04/18/11 05:32	4/18/2011 13:39
EPA 6010C	10/08/11	04/13/11 10:02	4/14/2011 12:31
EPA 8260B	04/25/11	04/14/11 12:16	4/15/2011 00:51
RSK-175	04/18/11	04/15/11 09:27	4/18/2011 11:43
SM18 4500-S D	04/18/11	04/15/11 13:23	4/15/2011 14:17
SM18 5310B	05/09/11	04/22/11 13:45	4/22/2011 14:24
VGC-13	04/25/11	04/13/11 13:17	4/13/2011 21:26

Client ID:	7601-MW11D	Lab ID:	C104061-05	Sampled:	04/11/11 12:53	Received:	04/12/11 13:00

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 300.0	05/09/11	04/13/11 23:37	4/13/2011 23:37
EPA 310.2	04/25/11	04/19/11 08:47	4/19/2011 10:08
EPA 353.2	04/13/11 12:53	04/12/11 12:06	4/12/2011 17:19
EPA 353.2	05/09/11	04/17/11 17:04	4/17/2011 20:06
EPA 353.2	01/04/14	04/18/11 05:32	4/18/2011 13:39
EPA 6010C	10/08/11	04/13/11 10:02	4/14/2011 12:40
EPA 8260B	04/25/11	04/14/11 12:16	4/15/2011 01:20
RSK-175	04/18/11	04/15/11 09:27	4/18/2011 11:46
SM18 4500-S D	04/18/11	04/15/11 13:23	4/15/2011 14:17
SM18 5310B	05/09/11	04/22/11 13:45	4/22/2011 14:24
VGC-13	04/25/11	04/13/11 13:17	4/13/2011 22:29

Client ID:	7601-MW1	Lab ID:	C104568-01	Sampled:	04/12/11 16:11	Received:	04/13/11 13:15

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 300.0	05/10/11	04/21/11 03:53	4/22/2011 03:47
EPA 353.2	04/14/11 16:11	04/13/11 14:29	4/13/2011 16:24
EPA 353.2	05/10/11	04/17/11 17:06	4/17/2011 21:23
EPA 353.2	01/05/14	04/18/11 05:32	4/18/2011 13:39
EPA 6010C	10/09/11	04/13/11 16:00	4/15/2011 12:04
RSK-175	04/19/11	04/15/11 09:27	4/18/2011 11:50
SM18 4500-S D	04/19/11	04/15/11 13:23	4/15/2011 14:17
SM18 5310B	05/10/11	04/22/11 13:45	4/25/2011 14:03
VGC-13	04/26/11	04/15/11 13:39	4/18/2011 14:13

Client ID: 7601-MW1	Lab ID: C104568-01RE1	Sampled: 04/12/11 16:11	Received: 04/13/11 13:15

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 310.2	04/26/11	04/19/11 08:47	4/19/2011 10:34
RSK-175	04/19/11	04/15/11 09:27	4/18/2011 12:38

Client ID: 7601-MW7	Lab ID: C104568-02	Sampled: 04/12/11 13:58	Received: 04/13/11 13:15

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 300.0	05/10/11	04/21/11 03:53	4/22/2011 04:25
EPA 310.2	04/26/11	04/19/11 08:47	4/19/2011 10:11
EPA 353.2	04/14/11 13:58	04/13/11 14:29	4/13/2011 16:26
EPA 353.2	01/05/14	04/18/11 05:32	4/18/2011 13:39
EPA 6010C	10/09/11	04/13/11 16:00	4/15/2011 12:06
RSK-175	04/19/11	04/15/11 09:27	4/18/2011 11:54
SM18 4500-S D	04/19/11	04/15/11 13:23	4/15/2011 14:17
SM18 5310B	05/10/11	04/22/11 13:45	4/25/2011 14:03
VGC-13	04/26/11	04/15/11 13:39	4/18/2011 15:16

Client ID: 7601-MW7	Lab ID: C104568-02RE1	Sampled: 04/12/11 13:58	Received: 04/13/11 13:15

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 353.2	05/10/11	04/17/11 17:06	4/17/2011 22:10
RSK-175	04/19/11	04/15/11 09:27	4/18/2011 12:42

Client ID: 7601-MW8	Lab ID: C104568-03	Sampled: 04/12/11 12:17	Received: 04/13/11 13:15

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 300.0	05/10/11	04/21/11 03:53	4/22/2011 04:43
EPA 310.2	04/26/11	04/19/11 08:47	4/19/2011 10:12
EPA 353.2	04/14/11 12:17	04/13/11 14:29	4/13/2011 16:27
EPA 353.2	05/10/11	04/17/11 17:06	4/17/2011 21:27
EPA 353.2	01/05/14	04/18/11 05:32	4/18/2011 13:39
EPA 6010C	10/09/11	04/13/11 16:00	4/15/2011 12:08
RSK-175	04/19/11	04/15/11 09:27	4/18/2011 11:58
SM18 4500-S D	04/19/11	04/15/11 13:23	4/15/2011 14:17
SM18 5310B	05/10/11	04/22/11 13:45	4/25/2011 14:03
VGC-13	04/26/11	04/15/11 13:39	4/18/2011 16:18

Client ID: 7601-MW9	Lab ID: C104568-04	Sampled: 04/12/11 10:33	Received: 04/13/11 13:15

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 300.0	05/10/11	04/21/11 03:53	4/22/2011 05:02
EPA 310.2	04/26/11	04/19/11 08:47	4/19/2011 10:13
EPA 353.2	04/14/11 10:33	04/13/11 14:29	4/13/2011 16:28
EPA 353.2	05/10/11	04/17/11 17:06	4/17/2011 21:30
EPA 353.2	01/05/14	04/18/11 05:32	4/18/2011 13:39
EPA 6010C	10/09/11	04/13/11 16:00	4/15/2011 12:10
RSK-175	04/19/11	04/15/11 09:27	4/18/2011 12:02
SM18 4500-S D	04/19/11	04/15/11 13:23	4/15/2011 14:17
SM18 5310B	05/10/11	04/22/11 13:45	4/25/2011 14:03
VGC-13	04/26/11	04/15/11 13:39	4/18/2011 17:21

Client ID: 7601-MW2	Lab ID: C104671-01	Sampled: 04/13/11 13:12	Received: 04/14/11 11:00

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 300.0	05/11/11	04/21/11 03:53	4/22/2011 05:21
EPA 310.2	04/27/11	04/19/11 08:47	4/19/2011 10:16
EPA 353.2	04/15/11 13:12	04/14/11 18:15	4/14/2011 18:15
EPA 353.2	05/11/11	04/17/11 17:06	4/17/2011 21:31
EPA 353.2	01/06/14	04/18/11 05:32	4/18/2011 13:39
EPA 6010C	10/10/11	04/14/11 13:42	4/15/2011 13:57
EPA 8260B	04/27/11	04/19/11 12:22	4/20/2011 00:53
RSK-175	04/20/11	04/18/11 16:19	4/18/2011 17:14
SM18 4500-S D	04/20/11	04/15/11 13:23	4/15/2011 14:17
SM18 5310B	05/11/11	04/26/11 08:40	4/27/2011 13:09
VGC-13	04/27/11	04/15/11 13:39	4/18/2011 18:23

Client ID: 7601-MW6 (MS/MSD)	Lab ID: C104671-02	Sampled: 04/13/11 09:53	Received: 04/14/11 11:00

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 300.0	05/11/11	04/21/11 03:53	4/22/2011 06:17
EPA 310.2	04/27/11	04/19/11 08:47	4/19/2011 10:16
EPA 353.2	04/15/11 09:53	04/14/11 18:10	4/14/2011 18:10
EPA 353.2	01/06/14	04/18/11 05:36	4/18/2011 13:39
EPA 6010C	10/10/11	04/14/11 13:42	4/15/2011 12:41
RSK-175	04/20/11	04/18/11 16:19	4/18/2011 17:17
SM18 4500-S D	04/20/11	04/15/11 13:23	4/15/2011 14:17
SM18 5310B	05/11/11	04/26/11 08:40	4/27/2011 13:09
VGC-13	04/27/11	04/15/11 13:39	4/18/2011 19:26

Client ID: 7601-MW6 (MS/MSD)	Lab ID: C104671-02RE1	Sampled: 04/13/11 09:53	Received: 04/14/11 11:00

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 353.2	05/11/11	04/17/11 17:06	4/17/2011 22:11

NORTH CAROLINA SWS SAMPLE DETECTION SUMMARY

Client ID: 7601-MW5 **Lab ID: C104061-01**

Analyte	Results	Flag	DF	MDL	MRL	NC SWSL	Units	Method	Notes
Calcium - Total	70300		1	20.0	100	NE	ug/L	EPA 6010C	
Carbon dioxide	42600		1	2000	2500	NE	ug/L	RSK-175	
Chloride	8400	B	1	47	5000	NE	ug/L	EPA 300.0	J-01
Magnesium - Total	70300		1	23.0	100	NE	ug/L	EPA 6010C	
Nitrate as N	1200	J	1	25	100	10000	ug/L	EPA 353.2	
Nitrate/Nitrite as N	1200		1	25	100	NE	ug/L	EPA 353.2	
Potassium - Total	461	J	1	150	500	NE	ug/L	EPA 6010C	
Sodium - Total	19700		1	400	500	NE	ug/L	EPA 6010C	
Sulfate as SO4	9700	J	1	20	5000	250000	ug/L	EPA 300.0	
Total Organic Carbon	1600		1	270	1000	NE	ug/L	SM18 5310B	

Client ID: 7601-MW5 **Lab ID: C104061-01RE2**

Analyte	Results	Flag	DF	MDL	MRL	NC SWSL	Units	Method	Notes
Total Alkalinity as CaCO3	460000	D	4	48000	60000	NE	ug/L	EPA 310.2	

Client ID: 7601-MW10S **Lab ID: C104061-02**

Analyte	Results	Flag	DF	MDL	MRL	NC SWSL	Units	Method	Notes
1,1-Dichloroethane	26		1	0.080	1.0	5	ug/L	EPA 8260B	
Calcium - Total	21700		1	20.0	100	NE	ug/L	EPA 6010C	
Chloride	32000	B	1	47	5000	NE	ug/L	EPA 300.0	QB-01
Chloroethane	3.4	J	1	0.75	1.0	10	ug/L	EPA 8260B	
cis-1,2-Dichloroethene	2.6	J	1	0.72	1.0	5	ug/L	EPA 8260B	
Dichlorodifluoromethane	4.0	J	1	0.56	1.0	5	ug/L	EPA 8260B	
Magnesium - Total	13400		1	23.0	100	NE	ug/L	EPA 6010C	
Methylene chloride	0.72	J	1	0.14	1.0	1	ug/L	EPA 8260B	
Potassium - Total	792		1	150	500	NE	ug/L	EPA 6010C	
Sodium - Total	7350		1	400	500	NE	ug/L	EPA 6010C	
Sulfate as SO4	15000	J	1	20	5000	250000	ug/L	EPA 300.0	
Tetrachloroethene	2.8		1	0.73	1.0	1	ug/L	EPA 8260B	
Total Alkalinity as CaCO3	43000		1	12000	15000	NE	ug/L	EPA 310.2	
Total Organic Carbon	1500		1	270	1000	NE	ug/L	SM18 5310B	
Trichloroethene	2.2		1	0.72	1.0	1	ug/L	EPA 8260B	
Trichlorofluoromethane	3.9		1	0.66	1.0	1	ug/L	EPA 8260B	

Client ID: 7601-MW10D **Lab ID: C104061-03**

Analyte	Results	Flag	DF	MDL	MRL	NC SWSL	Units	Method	Notes
1,1-Dichloroethane	23		1	0.080	1.0	5	ug/L	EPA 8260B	
1,4-Dichlorobenzene	0.93	J	1	0.79	1.0	1	ug/L	EPA 8260B	
Calcium - Total	180000		1	20.0	100	NE	ug/L	EPA 6010C	
Carbon dioxide	79000		1	2000	2500	NE	ug/L	RSK-175	
Chloroethane	6.4	J	1	0.75	1.0	10	ug/L	EPA 8260B	
cis-1,2-Dichloroethene	3.7	J	1	0.72	1.0	5	ug/L	EPA 8260B	
Magnesium - Total	60700		1	23.0	100	NE	ug/L	EPA 6010C	
Methane	4.30		1	0.490	1.00	NE	ug/L	RSK-175	
Methylene chloride	0.52	J	1	0.14	1.0	1	ug/L	EPA 8260B	
Nitrite as N	5.3	JB	1	3.0	100	1000	ug/L	EPA 353.2	J-01
Potassium - Total	39400		1	150	500	NE	ug/L	EPA 6010C	
Sodium - Total	29800		1	400	500	NE	ug/L	EPA 6010C	
Sulfate as SO4	35000	J	1	20	5000	250000	ug/L	EPA 300.0	

Client ID: 7601-MW10D							Lab ID: C104061-03		
Analyte	**Results**	**Flag**	**DF**	**MDL**	**MRL**	**NC SWSL**	**Units**	**Method**	**Notes**
Total Organic Carbon	6900		1	270	1000	NE	ug/L	SM18 5310B	
Vinyl chloride	0.63	J	1	0.60	1.0	1	ug/L	EPA 8260B	

Client ID: 7601-MW10D							Lab ID: C104061-03RE1		
Analyte	**Results**	**Flag**	**DF**	**MDL**	**MRL**	**NC SWSL**	**Units**	**Method**	**Notes**
Total Alkalinity as CaCO3	330000	D	2	24000	30000	NE	ug/L	EPA 310.2	

Client ID: 7601-MW10D							Lab ID: C104061-03RE2		
Analyte	**Results**	**Flag**	**DF**	**MDL**	**MRL**	**NC SWSL**	**Units**	**Method**	**Notes**
Chloride	270000	BD	5	240	25000	NE	ug/L	EPA 300.0	QB-01

Client ID: 7601-MW11S							Lab ID: C104061-04		
Analyte	**Results**	**Flag**	**DF**	**MDL**	**MRL**	**NC SWSL**	**Units**	**Method**	**Notes**
Calcium - Total	5540		1	20.0	100	NE	ug/L	EPA 6010C	
Carbon dioxide	53200		1	2000	2500	NE	ug/L	RSK-175	
Chloride	5300	B	1	47	5000	NE	ug/L	EPA 300.0	J-01
Magnesium - Total	1740		1	23.0	100	NE	ug/L	EPA 6010C	
Nitrate/Nitrite as N	79	J	1	25	100	NE	ug/L	EPA 353.2	
Potassium - Total	311	J	1	150	500	NE	ug/L	EPA 6010C	
Sodium - Total	5900		1	400	500	NE	ug/L	EPA 6010C	
Sulfate as SO4	4500	J	1	20	5000	250000	ug/L	EPA 300.0	
Total Alkalinity as CaCO3	18000		1	12000	15000	NE	ug/L	EPA 310.2	
Total Organic Carbon	620	J	1	270	1000	NE	ug/L	SM18 5310B	

Client ID: 7601-MW11D							Lab ID: C104061-05		
Analyte	**Results**	**Flag**	**DF**	**MDL**	**MRL**	**NC SWSL**	**Units**	**Method**	**Notes**
Calcium - Total	22800		1	20.0	100	NE	ug/L	EPA 6010C	
Carbon dioxide	13300		1	2000	2500	NE	ug/L	RSK-175	
Chloride	4500	JB	1	47	5000	NE	ug/L	EPA 300.0	J-01
Magnesium - Total	7170		1	23.0	100	NE	ug/L	EPA 6010C	
Potassium - Total	994		1	150	500	NE	ug/L	EPA 6010C	
Sodium - Total	12100		1	400	500	NE	ug/L	EPA 6010C	
Sulfate as SO4	4200	J	1	20	5000	250000	ug/L	EPA 300.0	
Total Alkalinity as CaCO3	98000		1	12000	15000	NE	ug/L	EPA 310.2	
Total Organic Carbon	710	J	1	270	1000	NE	ug/L	SM18 5310B	

Client ID: 7601-MW1							Lab ID: C104568-01		
Analyte	**Results**	**Flag**	**DF**	**MDL**	**MRL**	**NC SWSL**	**Units**	**Method**	**Notes**
Acetic Acid	34000		1	83	500	NE	ug/L	VGC-13	
Calcium - Total	89400		1	20.0	100	NE	ug/L	EPA 6010C	
Chloride	74000	B	1	47	5000	NE	ug/L	EPA 300.0	QB-01
Ethene	1.85	J	1	1.60	2.00	NE	ug/L	RSK-175	
Magnesium - Total	33300		1	23.0	100	NE	ug/L	EPA 6010C	
Methane	3340		1	0.490	1.00	NE	ug/L	RSK-175	
Nitrate as N	67	J	1	25	100	10000	ug/L	EPA 353.2	
Nitrate/Nitrite as N	67	J	1	25	100	NE	ug/L	EPA 353.2	
Propionic Acid	2800		1	180	500	NE	ug/L	VGC-13	
Sodium - Total	5610		1	400	500	NE	ug/L	EPA 6010C	
Sulfate as SO4	2000	J	1	20	5000	250000	ug/L	EPA 300.0	
Sulfide	64	J	1	10	100	1000	ug/L	SM18 4500-S D	
Total Organic Carbon	20000		1	270	1000	NE	ug/L	SM18 5310B	

Client ID: 7601-MW1 **Lab ID: C104568-01RE1**

Analyte	Results	Flag	DF	MDL	MRL	NC SWSL	Units	Method	Notes
Carbon dioxide	440000	D	10	20000	25000	NE	ug/L	RSK-175	
Total Alkalinity as CaCO3	330000	D	2	24000	30000	NE	ug/L	EPA 310.2	

Client ID: 7601-MW7 **Lab ID: C104568-02**

Analyte	Results	Flag	DF	MDL	MRL	NC SWSL	Units	Method	Notes
Calcium - Total	13300		1	20.0	100	NE	ug/L	EPA 6010C	
Chloride	20000	B	1	47	5000	NE	ug/L	EPA 300.0	QB-01
Magnesium - Total	5280		1	23.0	100	NE	ug/L	EPA 6010C	
Methane	1620		1	0.490	1.00	NE	ug/L	RSK-175	
Nitrate as N	3300	J	1	25	100	10000	ug/L	EPA 353.2	
Potassium - Total	305	J	1	150	500	NE	ug/L	EPA 6010C	
Sodium - Total	3580		1	400	500	NE	ug/L	EPA 6010C	
Sulfate as SO4	2100	J	1	20	5000	250000	ug/L	EPA 300.0	
Total Alkalinity as CaCO3	26000		1	12000	15000	NE	ug/L	EPA 310.2	
Total Organic Carbon	1300		1	270	1000	NE	ug/L	SM18 5310B	

Client ID: 7601-MW7 **Lab ID: C104568-02RE1**

Analyte	Results	Flag	DF	MDL	MRL	NC SWSL	Units	Method	Notes
Carbon dioxide	307000	D	10	20000	25000	NE	ug/L	RSK-175	
Nitrate/Nitrite as N	3300	D	3	75	300	NE	ug/L	EPA 353.2	

Client ID: 7601-MW8 **Lab ID: C104568-03**

Analyte	Results	Flag	DF	MDL	MRL	NC SWSL	Units	Method	Notes
Calcium - Total	25000		1	20.0	100	NE	ug/L	EPA 6010C	
Carbon dioxide	62300		1	2000	2500	NE	ug/L	RSK-175	
Chloride	10000	B	1	47	5000	NE	ug/L	EPA 300.0	J-01
Magnesium - Total	4640		1	23.0	100	NE	ug/L	EPA 6010C	
Methane	0.640	J	1	0.490	1.00	NE	ug/L	RSK-175	
Nitrate as N	1900	J	1	25	100	10000	ug/L	EPA 353.2	
Nitrate/Nitrite as N	1900		1	25	100	NE	ug/L	EPA 353.2	
Potassium - Total	278	J	1	150	500	NE	ug/L	EPA 6010C	
Sodium - Total	15200		1	400	500	NE	ug/L	EPA 6010C	
Sulfate as SO4	2100	J	1	20	5000	250000	ug/L	EPA 300.0	
Total Alkalinity as CaCO3	88000		1	12000	15000	NE	ug/L	EPA 310.2	
Total Organic Carbon	850	J	1	270	1000	NE	ug/L	SM18 5310B	

Client ID: 7601-MW9 **Lab ID: C104568-04**

Analyte	Results	Flag	DF	MDL	MRL	NC SWSL	Units	Method	Notes
Calcium - Total	44700		1	20.0	100	NE	ug/L	EPA 6010C	
Carbon dioxide	138000		1	2000	2500	NE	ug/L	RSK-175	
Chloride	16000	B	1	47	5000	NE	ug/L	EPA 300.0	J-01
Magnesium - Total	23400		1	23.0	100	NE	ug/L	EPA 6010C	
Potassium - Total	201	J	1	150	500	NE	ug/L	EPA 6010C	
Sodium - Total	25400		1	400	500	NE	ug/L	EPA 6010C	
Sulfate as SO4	15000	J	1	20	5000	250000	ug/L	EPA 300.0	
Total Alkalinity as CaCO3	190000		1	12000	15000	NE	ug/L	EPA 310.2	
Total Organic Carbon	1600		1	270	1000	NE	ug/L	SM18 5310B	

Client ID: 7601-MW2 **Lab ID: C104671-01**

Analyte	Results	Flag	DF	MDL	MRL	NC SWSL	Units	Method	Notes

Client ID: 7601-MW2								Lab ID: C104671-01	
Analyte	**Results**	**Flag**	**DF**	**MDL**	**MRL**	**NC SWSL**	**Units**	**Method**	**Notes**
1,1-Dichloroethane	28		1	0.080	1.0	5	ug/L	EPA 8260B	
1,1-Dichloroethene	0.89	J	1	0.60	1.0	5	ug/L	EPA 8260B	
Calcium - Total	5840		1	20.0	100	NE	ug/L	EPA 6010C	
Carbon dioxide	167000		1	2000	2500	NE	ug/L	RSK-175	
Chloride	22000	B	1	47	5000	NE	ug/L	EPA 300.0	QB-01
Chloroethane	2.4	J	1	0.75	1.0	10	ug/L	EPA 8260B	
Magnesium - Total	3600		1	23.0	100	NE	ug/L	EPA 6010C	
Methylene chloride	0.90	J	1	0.14	1.0	1	ug/L	EPA 8260B	
Potassium - Total	445	J	1	150	500	NE	ug/L	EPA 6010C	
Sodium - Total	7210		1	400	500	NE	ug/L	EPA 6010C	
Sulfate as SO4	6400	J	1	20	5000	250000	ug/L	EPA 300.0	
Tetrachloroethene	0.74	J	1	0.73	1.0	1	ug/L	EPA 8260B	
Total Organic Carbon	6400		1	270	1000	NE	ug/L	SM18 5310B	

Client ID: 7601-MW6 (MS/MSD)								Lab ID: C104671-02	
Analyte	**Results**	**Flag**	**DF**	**MDL**	**MRL**	**NC SWSL**	**Units**	**Method**	**Notes**
Calcium - Total	4750		1	20.0	100	NE	ug/L	EPA 6010C	
Carbon dioxide	65000		1	2000	2500	NE	ug/L	RSK-175	
Chloride	5000	B	1	47	5000	NE	ug/L	EPA 300.0	J-01
Magnesium - Total	4090		1	23.0	100	NE	ug/L	EPA 6010C	
Nitrate as N	3400	J	1	25	100	10000	ug/L	EPA 353.2	
Nitrite as N	6.9	JB	1	3.0	100	1000	ug/L	EPA 353.2	J-01
Potassium - Total	691		1	150	500	NE	ug/L	EPA 6010C	
Sodium - Total	7470		1	400	500	NE	ug/L	EPA 6010C	
Sulfate as SO4	4300	J	1	20	5000	250000	ug/L	EPA 300.0	
Total Alkalinity as CaCO3	23000		1	12000	15000	NE	ug/L	EPA 310.2	
Total Organic Carbon	1000		1	270	1000	NE	ug/L	SM18 5310B	

Client ID: 7601-MW6 (MS/MSD)								Lab ID: C104671-02RE1	
Analyte	**Results**	**Flag**	**DF**	**MDL**	**MRL**	**NC SWSL**	**Units**	**Method**	**Notes**
Nitrate/Nitrite as N	3400		1	100	400	NE	ug/L	EPA 353.2	

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ANALYTICAL RESULTS

Description: 7601-MW5 | **Lab Sample ID:** C104061-01 | **Received:** 04/12/11 13:00

Matrix: Ground Water | **Sampled:** 04/11/11 10:32 | **Work Order:** C104061

Project: Randolph County LF | **Sampled By:** N. Rathjen

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
Calcium [7440-70-2] ^	**70300**		ug/L	1	20.0	100	NE	EPA 6010C	04/14/11 12:24	JDH	
Magnesium [7439-95-4] ^	**70300**		ug/L	1	23.0	100	NE	EPA 6010C	04/14/11 12:24	JDH	
Potassium [7440-09-7] ^	**461**	J	ug/L	1	150	500	NE	EPA 6010C	04/14/11 12:24	JDH	
Sodium [7440-23-5] ^	**19700**		ug/L	1	400	500	NE	EPA 6010C	04/14/11 12:24	JDH	

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Description: 7601-MW5 | **Lab Sample ID:** C104061-01 | **Received:** 04/12/11 13:00

Matrix: Ground Water | **Sampled:** 04/11/11 10:32 | **Work Order:** C104061

Project: Randolph County LF | **Sampled By:** N. Rathjen

Classical Chemistry Parameters

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Chloride [16887-00-6] ^	**8400**	B	ug/L	1	47	5000	NE	EPA 300.0	04/13/11 21:07	CCB	J-01
Nitrate as N [14797-55-8] ^	**1200**	J	ug/L	1	25	100	10000	EPA 353.2	04/18/11 13:39	CCB	
Nitrate/Nitrite as N [ECL-0010] ^	**1200**		ug/L	1	25	100	NE	EPA 353.2	04/17/11 19:57	CCB	
Nitrite as N [14797-65-0] ^	3.0	U	ug/L	1	3.0	100	1000	EPA 353.2	04/12/11 17:13	AJB	
Sulfate as SO4 [14808-79-8] ^	**9700**	J	ug/L	1	20	5000	250000	EPA 300.0	04/13/11 21:07	CCB	
Sulfide [18496-25-8] ^	10	U	ug/L	1	10	100	1000	SM18 4500-S D	04/15/11 14:17	JOC	
Total Alkalinity as CaCO3 [471-34-1] ^	**460000**	D	ug/L	4	48000	60000	NE	EPA 310.2	04/19/11 10:58	CCB	

Description: 7601-MW5 | **Lab Sample ID:** C104061-01 | **Received:** 04/12/11 13:00

Matrix: Ground Water | **Sampled:** 04/11/11 10:32 | **Work Order:** C104061

Project: Randolph County LF | **Sampled By:** N. Rathjen

Classical Chemistry Parameters

^ - ENCO Orlando certified analyte [NC 424]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Total Organic Carbon [ECL-0165] ^	**1600**		ug/L	1	270	1000	NE	SM18 5310B	04/22/11 14:24	RSA	

Description: 7601-MW5 **Lab Sample ID:** C104061-01 **Received:** 04/12/11 13:00

Matrix: Ground Water **Sampled:** 04/11/11 10:32 **Work Order:** C104061

Project: Randolph County LF **Sampled By:** N. Rathjen

Dissolved Gases by GC

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Acetylene [74-86-2]	1.00	U	ug/L	1	1.00	2.00		RSK-175	04/18/11 11:31	LAC	
Carbon dioxide [124-38-9]	**42600**		ug/L	1	2000	2500	NE	RSK-175	04/18/11 11:31	LAC	
Ethane [74-84-0]	1.50	U	ug/L	1	1.50	2.00	NE	RSK-175	04/18/11 11:31	LAC	
Ethene [74-85-1]	1.60	U	ug/L	1	1.60	2.00	NE	RSK-175	04/18/11 11:31	LAC	
Methane [74-82-8]	0.490	U	ug/L	1	0.490	1.00	NE	RSK-175	04/18/11 11:31	LAC	

Description: 7601-MW5 | **Lab Sample ID:** C104061-01 | **Received:** 04/12/11 13:00

Matrix: Ground Water | **Sampled:** 04/11/11 10:32 | **Work Order:** C104061

Project: Randolph County LF | **Sampled By:** N. Rathjen

Volatile Fatty Acids by HPLC

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Acetic Acid [64-19-7]	83	U	ug/L	1	83	500	NE	VGC-13	04/13/11 18:19	MEF	
Butyric Acid [107-92-6]	160	U	ug/L	1	160	500	NE	VGC-13	04/13/11 18:19	MEF	
Hexanoic Acid [142-62-1]	230	U	ug/L	1	230	1000		VGC-13	04/13/11 18:19	MEF	
HIBA (2-Hydroxyisobutyric Acid) [594-61-6]	160	U	ug/L	1	160	500		VGC-13	04/13/11 18:19	MEF	
iso-Hexanoic Acid [646-07-1]	210	U	ug/L	1	210	1000		VGC-13	04/13/11 18:19	MEF	
iso-Pentanoic Acid [503-74-2]	260	U	ug/L	1	260	500		VGC-13	04/13/11 18:19	MEF	
Lactic Acid [50-21-5]	440	U	ug/L	1	440	500	NE	VGC-13	04/13/11 18:19	MEF	
Pentanoic Acid [109-52-4]	270	U	ug/L	1	270	500		VGC-13	04/13/11 18:19	MEF	
Propionic Acid [79-09-4]	180	U	ug/L	1	180	500	NE	VGC-13	04/13/11 18:19	MEF	
Pyruvic Acid [127-17-3]	140	U	ug/L	1	140	500	NE	VGC-13	04/13/11 18:19	MEF	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
Trimethylacetic acid	*57000*	*1*	*49800*	*115 %*	*80-124*	*1D13016*	*VGC-13*	*04/13/11 18:19*	*MEF*	

Description: 7601-MW10S | **Lab Sample ID:** C104061-02 | **Received:** 04/12/11 13:00

Matrix: Ground Water | **Sampled:** 04/11/11 15:17 | **Work Order:** C104061

Project: Randolph County LF | **Sampled By:** N. Rathjen

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	04/14/11 23:53	JKG	
1,1,1-Trichloroethane [71-55-6] ^	0.65	U	ug/L	1	0.65	1.0	1	EPA 8260B	04/14/11 23:53	JKG	
1,1,2,2-Tetrachloroethane [79-34-5] ^	0.75	U	ug/L	1	0.75	1.0	3	EPA 8260B	04/14/11 23:53	JKG	
1,1,2-Trichloroethane [79-00-5] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	04/14/11 23:53	JKG	
1,1-Dichloroethane [75-34-3] ^	**26**		ug/L	1	0.080	1.0	5	EPA 8260B	04/14/11 23:53	JKG	
1,1-Dichloroethene [75-35-4] ^	0.60	U	ug/L	1	0.60	1.0	5	EPA 8260B	04/14/11 23:53	JKG	
1,1-Dichloropropene [563-58-6] ^	0.66	U	ug/L	1	0.66	1.0	5	EPA 8260B	04/14/11 23:53	JKG	
1,2,3-Trichloropropane [96-18-4] ^	0.72	U	ug/L	1	0.72	1.0	1	EPA 8260B	04/14/11 23:53	JKG	
1,2,4-Trichlorobenzene [120-82-1] ^	0.58	U	ug/L	1	0.58	1.0	10	EPA 8260B	04/14/11 23:53	JKG	
1,2-Dibromo-3-chloropropane [96-12-8] ^	0.48	U	ug/L	1	0.48	1.0	13	EPA 8260B	04/14/11 23:53	JKG	
1,2-Dibromoethane [106-93-4] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	04/14/11 23:53	JKG	
1,2-Dichlorobenzene [95-50-1] ^	0.11	U	ug/L	1	0.11	1.0	5	EPA 8260B	04/14/11 23:53	JKG	
1,2-Dichloroethane [107-06-2] ^	0.47	U	ug/L	1	0.47	1.0	1	EPA 8260B	04/14/11 23:53	JKG	
1,2-Dichloropropane [78-87-5] ^	0.59	U	ug/L	1	0.59	1.0	1	EPA 8260B	04/14/11 23:53	JKG	
1,3-Dichlorobenzene [541-73-1] ^	0.79	U	ug/L	1	0.79	1.0	5	EPA 8260B	04/14/11 23:53	JKG	
1,3-Dichloropropane [142-28-9] ^	0.67	U	ug/L	1	0.67	1.0	1	EPA 8260B	04/14/11 23:53	JKG	
1,4-Dichlorobenzene [106-46-7] ^	0.79	U	ug/L	1	0.79	1.0	1	EPA 8260B	04/14/11 23:53	JKG	
2,2-Dichloropropane [594-20-7] ^	0.56	U	ug/L	1	0.56	1.0	15	EPA 8260B	04/14/11 23:53	JKG	
2-Butanone [78-93-3] ^	1.3	U	ug/L	1	1.3	5.0	100	EPA 8260B	04/14/11 23:53	JKG	
2-Hexanone [591-78-6] ^	0.88	U	ug/L	1	0.88	5.0	50	EPA 8260B	04/14/11 23:53	JKG	
3-Chloropropene [107-05-1] ^	0.11	U	ug/L	1	0.11	1.0	10	EPA 8260B	04/14/11 23:53	JKG	
4-Methyl-2-pentanone [108-10-1] ^	1.1	U	ug/L	1	1.1	5.0	100	EPA 8260B	04/14/11 23:53	JKG	
Acetone [67-64-1] ^	1.2	U	ug/L	1	1.2	5.0	100	EPA 8260B	04/14/11 23:53	JKG	
Acetonitrile [75-05-8] ^	5.0	U	ug/L	1	5.0	10	55	EPA 8260B	04/14/11 23:53	JKG	
Acrolein [107-02-8] ^	4.0	U	ug/L	1	4.0	10	53	EPA 8260B	04/14/11 23:53	JKG	
Acrylonitrile [107-13-1] ^	3.5	U	ug/L	1	3.5	10	200	EPA 8260B	04/14/11 23:53	JKG	
Benzene [71-43-2] ^	0.68	U	ug/L	1	0.68	1.0	1	EPA 8260B	04/14/11 23:53	JKG	
Bromochloromethane [74-97-5] ^	0.87	U	ug/L	1	0.87	1.0	3	EPA 8260B	04/14/11 23:53	JKG	
Bromodichloromethane [75-27-4] ^	0.75	U	ug/L	1	0.75	1.0	1	EPA 8260B	04/14/11 23:53	JKG	
Bromoform [75-25-2] ^	0.68	U	ug/L	1	0.68	1.0	3	EPA 8260B	04/14/11 23:53	JKG	
Bromomethane [74-83-9] ^	0.58	U	ug/L	1	0.58	1.0	10	EPA 8260B	04/14/11 23:53	JKG	
Carbon disulfide [75-15-0] ^	1.5	U	ug/L	1	1.5	5.0	100	EPA 8260B	04/14/11 23:53	JKG	
Carbon tetrachloride [56-23-5] ^	0.69	U	ug/L	1	0.69	1.0	1	EPA 8260B	04/14/11 23:53	JKG	
Chlorobenzene [108-90-7] ^	0.74	U	ug/L	1	0.74	1.0	3	EPA 8260B	04/14/11 23:53	JKG	
Chloroethane [75-00-3] ^	**3.4**	J	ug/L	1	0.75	1.0	10	EPA 8260B	04/14/11 23:53	JKG	
Chloroform [67-66-3] ^	0.70	U	ug/L	1	0.70	1.0	5	EPA 8260B	04/14/11 23:53	JKG	
Chloromethane [74-87-3] ^	0.55	U	ug/L	1	0.55	1.0	1	EPA 8260B	04/14/11 23:53	JKG	
Chloroprene [126-99-8] ^	0.64	U	ug/L	1	0.64	1.0	20	EPA 8260B	04/14/11 23:53	JKG	
cis-1,2-Dichloroethene [156-59-2] ^	**2.6**	J	ug/L	1	0.72	1.0	5	EPA 8260B	04/14/11 23:53	JKG	
cis-1,3-Dichloropropene [10061-01-5] ^	0.075	U	ug/L	1	0.075	1.0	1	EPA 8260B	04/14/11 23:53	JKG	
Dibromochloromethane [124-48-1] ^	0.63	U	ug/L	1	0.63	1.0	3	EPA 8260B	04/14/11 23:53	JKG	
Dibromomethane [74-95-3] ^	0.90	U	ug/L	1	0.90	1.0	10	EPA 8260B	04/14/11 23:53	JKG	
Dichlorodifluoromethane [75-71-8] ^	**4.0**	J	ug/L	1	0.56	1.0	5	EPA 8260B	04/14/11 23:53	JKG	
Ethyl Methacrylate [97-63-2] ^	0.38	U	ug/L	1	0.38	1.0	10	EPA 8260B	04/14/11 23:53	JKG	
Ethylbenzene [100-41-4] ^	0.62	U	ug/L	1	0.62	1.0	1	EPA 8260B	04/14/11 23:53	JKG	
Iodomethane [74-88-4] ^	1.7	U	ug/L	1	1.7	5.0	10	EPA 8260B	04/14/11 23:53	JKG	

Description: 7601-MW10S | **Lab Sample ID:** C104061-02 | **Received:** 04/12/11 13:00

Matrix: Ground Water | **Sampled:** 04/11/11 15:17 | **Work Order:** C104061

Project: Randolph County LF | **Sampled By:** N. Rathjen

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
Isobutyl alcohol [78-83-1] ^	11	U	ug/L	1	11	50	100	EPA 8260B	04/14/11 23:53	JKG	
Methacrylonitrile [126-98-7] ^	4.9	U	ug/L	1	4.9	10	100	EPA 8260B	04/14/11 23:53	JKG	
Methyl Methacrylate [80-62-6] ^	0.51	U	ug/L	1	0.51	1.0	30	EPA 8260B	04/14/11 23:53	JKG	
Methylene chloride [75-09-2] ^	**0.72**	J	ug/L	1	0.14	1.0	1	EPA 8260B	04/14/11 23:53	JKG	
Naphthalene [91-20-3] ^	0.46	U	ug/L	1	0.46	1.0	10	EPA 8260B	04/14/11 23:53	JKG	
Propionitrile [107-12-0] ^	5.0	U	ug/L	1	5.0	10	150	EPA 8260B	04/14/11 23:53	JKG	
Styrene [100-42-5] ^	0.053	U	ug/L	1	0.053	1.0	1	EPA 8260B	04/14/11 23:53	JKG	
Tetrachloroethene [127-18-4] ^	**2.8**		ug/L	1	0.73	1.0	1	EPA 8260B	04/14/11 23:53	JKG	
Toluene [108-88-3] ^	0.85	U	ug/L	1	0.85	1.0	1	EPA 8260B	04/14/11 23:53	JKG	
trans-1,2-Dichloroethene [156-60-5] ^	0.12	U	ug/L	1	0.12	1.0	5	EPA 8260B	04/14/11 23:53	JKG	
trans-1,3-Dichloropropene [10061-02-6] ^	0.50	U	ug/L	1	0.50	1.0	1	EPA 8260B	04/14/11 23:53	JKG	
trans-1,4-Dichloro-2-butene [110-57-6] ^	0.70	U	ug/L	1	0.70	1.0	100	EPA 8260B	04/14/11 23:53	JKG	
Trichloroethene [79-01-6] ^	**2.2**		ug/L	1	0.72	1.0	1	EPA 8260B	04/14/11 23:53	JKG	
Trichlorofluoromethane [75-69-4] ^	**3.9**		ug/L	1	0.66	1.0	1	EPA 8260B	04/14/11 23:53	JKG	
Vinyl acetate [108-05-4] ^	0.95	U	ug/L	1	0.95	5.0	50	EPA 8260B	04/14/11 23:53	JKG	
Vinyl chloride [75-01-4] ^	0.60	U	ug/L	1	0.60	1.0	1	EPA 8260B	04/14/11 23:53	JKG	
Xylenes (Total) [1330-20-7] ^	2.1	U	ug/L	1	2.1	3.0	5	EPA 8260B	04/14/11 23:53	JKG	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*45*	*1*	*50.0*	*90 %*	*51-122*	*1D14025*	*EPA 8260B*	*04/14/11 23:53*	*JKG*	
Dibromofluoromethane	*43*	*1*	*50.0*	*86 %*	*68-117*	*1D14025*	*EPA 8260B*	*04/14/11 23:53*	*JKG*	
Toluene-d8	*45*	*1*	*50.0*	*91 %*	*69-110*	*1D14025*	*EPA 8260B*	*04/14/11 23:53*	*JKG*	

Description: 7601-MW10S | **Lab Sample ID:** C104061-02 | **Received:** 04/12/11 13:00

Matrix: Ground Water | **Sampled:** 04/11/11 15:17 | **Work Order:** C104061

Project: Randolph County LF | **Sampled By:** N. Rathjen

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
Calcium [7440-70-2] ^	**21700**		ug/L	1	20.0	100	NE	EPA 6010C	04/14/11 12:26	JDH	
Magnesium [7439-95-4] ^	**13400**		ug/L	1	23.0	100	NE	EPA 6010C	04/14/11 12:26	JDH	
Potassium [7440-09-7] ^	**792**		ug/L	1	150	500	NE	EPA 6010C	04/14/11 12:26	JDH	
Sodium [7440-23-5] ^	**7350**		ug/L	1	400	500	NE	EPA 6010C	04/14/11 12:26	JDH	

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Description: 7601-MW10S | **Lab Sample ID:** C104061-02 | **Received:** 04/12/11 13:00

Matrix: Ground Water | **Sampled:** 04/11/11 15:17 | **Work Order:** C104061

Project: Randolph County LF | **Sampled By:** N. Rathjen

Classical Chemistry Parameters

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Chloride [16887-00-6] ^	**32000**	B	ug/L	1	47	5000	NE	EPA 300.0	04/13/11 21:45	CCB	QB-01
Nitrate as N [14797-55-8] ^	25	U	ug/L	1	25	100	10000	EPA 353.2	04/18/11 13:39	CCB	
Nitrate/Nitrite as N [ECL-0010] ^	25	U	ug/L	1	25	100	NE	EPA 353.2	04/17/11 19:59	CCB	
Nitrite as N [14797-65-0] ^	3.0	U	ug/L	1	3.0	100	1000	EPA 353.2	04/12/11 17:15	AJB	
Sulfate as SO4 [14808-79-8] ^	**15000**	J	ug/L	1	20	5000	250000	EPA 300.0	04/13/11 21:45	CCB	
Sulfide [18496-25-8] ^	10	U	ug/L	1	10	100	1000	SM18 4500-S D	04/15/11 14:17	JOC	
Total Alkalinity as CaCO3 [471-34-1] ^	**43000**		ug/L	1	12000	15000	NE	EPA 310.2	04/19/11 10:05	CCB	

Description: 7601-MW10S | **Lab Sample ID:** C104061-02 | **Received:** 04/12/11 13:00

Matrix: Ground Water | **Sampled:** 04/11/11 15:17 | **Work Order:** C104061

Project: Randolph County LF | **Sampled By:** N. Rathjen

Classical Chemistry Parameters

^ - ENCO Orlando certified analyte [NC 424]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Total Organic Carbon [ECL-0165] ^	**1500**		ug/L	1	270	1000	NE	SM18 5310B	04/22/11 14:24	RSA	

Description: 7601-MW10S
Matrix: Ground Water
Project: Randolph County LF

Lab Sample ID: C104061-02
Sampled: 04/11/11 15:17
Sampled By: N. Rathjen

Received: 04/12/11 13:00
Work Order: C104061

Dissolved Gases by GC

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Carbon dioxide [124-38-9]	2000	U	ug/L	1	2000	2500	NE	RSK-175	04/18/11 11:35	LAC	
Ethane [74-84-0]	1.50	U	ug/L	1	1.50	2.00	NE	RSK-175	04/18/11 11:35	LAC	
Ethene [74-85-1]	1.60	U	ug/L	1	1.60	2.00	NE	RSK-175	04/18/11 11:35	LAC	
Methane [74-82-8]	0.490	U	ug/L	1	0.490	1.00	NE	RSK-175	04/18/11 11:35	LAC	

Description: 7601-MW10S | **Lab Sample ID:** C104061-02 | **Received:** 04/12/11 13:00

Matrix: Ground Water | **Sampled:** 04/11/11 15:17 | **Work Order:** C104061

Project: Randolph County LF | **Sampled By:** N. Rathjen

Volatile Fatty Acids by HPLC

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Acetic Acid [64-19-7]	83	U	ug/L	1	83	500	NE	VGC-13	04/13/11 19:22	MEF	
Butyric Acid [107-92-6]	160	U	ug/L	1	160	500	NE	VGC-13	04/13/11 19:22	MEF	
Hexanoic Acid [142-62-1]	230	U	ug/L	1	230	1000		VGC-13	04/13/11 19:22	MEF	
HIBA (2-Hydroxyisobutyric Acid) [594-61-6]	160	U	ug/L	1	160	500		VGC-13	04/13/11 19:22	MEF	
iso-Hexanoic Acid [646-07-1]	210	U	ug/L	1	210	1000		VGC-13	04/13/11 19:22	MEF	
iso-Pentanoic Acid [503-74-2]	260	U	ug/L	1	260	500		VGC-13	04/13/11 19:22	MEF	
Lactic Acid [50-21-5]	440	U	ug/L	1	440	500	NE	VGC-13	04/13/11 19:22	MEF	
Pentanoic Acid [109-52-4]	270	U	ug/L	1	270	500		VGC-13	04/13/11 19:22	MEF	
Propionic Acid [79-09-4]	180	U	ug/L	1	180	500	NE	VGC-13	04/13/11 19:22	MEF	
Pyruvic Acid [127-17-3]	140	U	ug/L	1	140	500	NE	VGC-13	04/13/11 19:22	MEF	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
Trimethylacetic acid	*55000*	*1*	*49800*	*110 %*	*80-124*	*1D13016*	*VGC-13*	*04/13/11 19:22*	*MEF*	

Description: 7601-MW10D | **Lab Sample ID:** C104061-03 | **Received:** 04/12/11 13:00

Matrix: Ground Water | **Sampled:** 04/11/11 16:12 | **Work Order:** C104061

Project: Randolph County LF | **Sampled By:** N. Rathjen

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	04/15/11 00:22	JKG	
1,1,1-Trichloroethane [71-55-6] ^	0.65	U	ug/L	1	0.65	1.0	1	EPA 8260B	04/15/11 00:22	JKG	
1,1,2,2-Tetrachloroethane [79-34-5] ^	0.75	U	ug/L	1	0.75	1.0	3	EPA 8260B	04/15/11 00:22	JKG	
1,1,2-Trichloroethane [79-00-5] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	04/15/11 00:22	JKG	
1,1-Dichloroethane [75-34-3] ^	**23**		ug/L	1	0.080	1.0	5	EPA 8260B	04/15/11 00:22	JKG	
1,1-Dichloroethene [75-35-4] ^	0.60	U	ug/L	1	0.60	1.0	5	EPA 8260B	04/15/11 00:22	JKG	
1,1-Dichloropropene [563-58-6] ^	0.66	U	ug/L	1	0.66	1.0	5	EPA 8260B	04/15/11 00:22	JKG	
1,2,3-Trichloropropane [96-18-4] ^	0.72	U	ug/L	1	0.72	1.0	1	EPA 8260B	04/15/11 00:22	JKG	
1,2,4-Trichlorobenzene [120-82-1] ^	0.58	U	ug/L	1	0.58	1.0	10	EPA 8260B	04/15/11 00:22	JKG	
1,2-Dibromo-3-chloropropane [96-12-8] ^	0.48	U	ug/L	1	0.48	1.0	13	EPA 8260B	04/15/11 00:22	JKG	
1,2-Dibromoethane [106-93-4] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	04/15/11 00:22	JKG	
1,2-Dichlorobenzene [95-50-1] ^	0.11	U	ug/L	1	0.11	1.0	5	EPA 8260B	04/15/11 00:22	JKG	
1,2-Dichloroethane [107-06-2] ^	0.47	U	ug/L	1	0.47	1.0	1	EPA 8260B	04/15/11 00:22	JKG	
1,2-Dichloropropane [78-87-5] ^	0.59	U	ug/L	1	0.59	1.0	1	EPA 8260B	04/15/11 00:22	JKG	
1,3-Dichlorobenzene [541-73-1] ^	0.79	U	ug/L	1	0.79	1.0	5	EPA 8260B	04/15/11 00:22	JKG	
1,3-Dichloropropane [142-28-9] ^	0.67	U	ug/L	1	0.67	1.0	1	EPA 8260B	04/15/11 00:22	JKG	
1,4-Dichlorobenzene [106-46-7] ^	**0.93**	J	ug/L	1	0.79	1.0	1	EPA 8260B	04/15/11 00:22	JKG	
2,2-Dichloropropane [594-20-7] ^	0.56	U	ug/L	1	0.56	1.0	15	EPA 8260B	04/15/11 00:22	JKG	
2-Butanone [78-93-3] ^	1.3	U	ug/L	1	1.3	5.0	100	EPA 8260B	04/15/11 00:22	JKG	
2-Hexanone [591-78-6] ^	0.88	U	ug/L	1	0.88	5.0	50	EPA 8260B	04/15/11 00:22	JKG	
3-Chloropropene [107-05-1] ^	0.11	U	ug/L	1	0.11	1.0	10	EPA 8260B	04/15/11 00:22	JKG	
4-Methyl-2-pentanone [108-10-1] ^	1.1	U	ug/L	1	1.1	5.0	100	EPA 8260B	04/15/11 00:22	JKG	
Acetone [67-64-1] ^	1.2	U	ug/L	1	1.2	5.0	100	EPA 8260B	04/15/11 00:22	JKG	
Acetonitrile [75-05-8] ^	5.0	U	ug/L	1	5.0	10	55	EPA 8260B	04/15/11 00:22	JKG	
Acrolein [107-02-8] ^	4.0	U	ug/L	1	4.0	10	53	EPA 8260B	04/15/11 00:22	JKG	
Acrylonitrile [107-13-1] ^	3.5	U	ug/L	1	3.5	10	200	EPA 8260B	04/15/11 00:22	JKG	
Benzene [71-43-2] ^	0.68	U	ug/L	1	0.68	1.0	1	EPA 8260B	04/15/11 00:22	JKG	
Bromochloromethane [74-97-5] ^	0.87	U	ug/L	1	0.87	1.0	3	EPA 8260B	04/15/11 00:22	JKG	
Bromodichloromethane [75-27-4] ^	0.75	U	ug/L	1	0.75	1.0	1	EPA 8260B	04/15/11 00:22	JKG	
Bromoform [75-25-2] ^	0.68	U	ug/L	1	0.68	1.0	3	EPA 8260B	04/15/11 00:22	JKG	
Bromomethane [74-83-9] ^	0.58	U	ug/L	1	0.58	1.0	10	EPA 8260B	04/15/11 00:22	JKG	
Carbon disulfide [75-15-0] ^	1.5	U	ug/L	1	1.5	5.0	100	EPA 8260B	04/15/11 00:22	JKG	
Carbon tetrachloride [56-23-5] ^	0.69	U	ug/L	1	0.69	1.0	1	EPA 8260B	04/15/11 00:22	JKG	
Chlorobenzene [108-90-7] ^	0.74	U	ug/L	1	0.74	1.0	3	EPA 8260B	04/15/11 00:22	JKG	
Chloroethane [75-00-3] ^	**6.4**	J	ug/L	1	0.75	1.0	10	EPA 8260B	04/15/11 00:22	JKG	
Chloroform [67-66-3] ^	0.70	U	ug/L	1	0.70	1.0	5	EPA 8260B	04/15/11 00:22	JKG	
Chloromethane [74-87-3] ^	0.55	U	ug/L	1	0.55	1.0	1	EPA 8260B	04/15/11 00:22	JKG	
Chloroprene [126-99-8] ^	0.64	U	ug/L	1	0.64	1.0	20	EPA 8260B	04/15/11 00:22	JKG	
cis-1,2-Dichloroethene [156-59-2] ^	**3.7**	J	ug/L	1	0.72	1.0	5	EPA 8260B	04/15/11 00:22	JKG	
cis-1,3-Dichloropropene [10061-01-5] ^	0.075	U	ug/L	1	0.075	1.0	1	EPA 8260B	04/15/11 00:22	JKG	
Dibromochloromethane [124-48-1] ^	0.63	U	ug/L	1	0.63	1.0	3	EPA 8260B	04/15/11 00:22	JKG	
Dibromomethane [74-95-3] ^	0.90	U	ug/L	1	0.90	1.0	10	EPA 8260B	04/15/11 00:22	JKG	
Dichlorodifluoromethane [75-71-8] ^	0.56	U	ug/L	1	0.56	1.0	5	EPA 8260B	04/15/11 00:22	JKG	
Ethyl Methacrylate [97-63-2] ^	0.38	U	ug/L	1	0.38	1.0	10	EPA 8260B	04/15/11 00:22	JKG	
Ethylbenzene [100-41-4] ^	0.62	U	ug/L	1	0.62	1.0	1	EPA 8260B	04/15/11 00:22	JKG	
Iodomethane [74-88-4] ^	1.7	U	ug/L	1	1.7	5.0	10	EPA 8260B	04/15/11 00:22	JKG	

Description: 7601-MW10D | **Lab Sample ID:** C104061-03 | **Received:** 04/12/11 13:00

Matrix: Ground Water | **Sampled:** 04/11/11 16:12 | **Work Order:** C104061

Project: Randolph County LF | **Sampled By:** N. Rathjen

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
Isobutyl alcohol [78-83-1] ^	11	U	ug/L	1	11	50	100	EPA 8260B	04/15/11 00:22	JKG	
Methacrylonitrile [126-98-7] ^	4.9	U	ug/L	1	4.9	10	100	EPA 8260B	04/15/11 00:22	JKG	
Methyl Methacrylate [80-62-6] ^	0.51	U	ug/L	1	0.51	1.0	30	EPA 8260B	04/15/11 00:22	JKG	
Methylene chloride [75-09-2] ^	**0.52**	J	ug/L	1	0.14	1.0	1	EPA 8260B	04/15/11 00:22	JKG	
Naphthalene [91-20-3] ^	0.46	U	ug/L	1	0.46	1.0	10	EPA 8260B	04/15/11 00:22	JKG	
Propionitrile [107-12-0] ^	5.0	U	ug/L	1	5.0	10	150	EPA 8260B	04/15/11 00:22	JKG	
Styrene [100-42-5] ^	0.053	U	ug/L	1	0.053	1.0	1	EPA 8260B	04/15/11 00:22	JKG	
Tetrachloroethene [127-18-4] ^	0.73	U	ug/L	1	0.73	1.0	1	EPA 8260B	04/15/11 00:22	JKG	
Toluene [108-88-3] ^	0.85	U	ug/L	1	0.85	1.0	1	EPA 8260B	04/15/11 00:22	JKG	
trans-1,2-Dichloroethene [156-60-5] ^	0.12	U	ug/L	1	0.12	1.0	5	EPA 8260B	04/15/11 00:22	JKG	
trans-1,3-Dichloropropene [10061-02-6] ^	0.50	U	ug/L	1	0.50	1.0	1	EPA 8260B	04/15/11 00:22	JKG	
trans-1,4-Dichloro-2-butene [110-57-6] ^	0.70	U	ug/L	1	0.70	1.0	100	EPA 8260B	04/15/11 00:22	JKG	
Trichloroethene [79-01-6] ^	0.72	U	ug/L	1	0.72	1.0	1	EPA 8260B	04/15/11 00:22	JKG	
Trichlorofluoromethane [75-69-4] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	04/15/11 00:22	JKG	
Vinyl acetate [108-05-4] ^	0.95	U	ug/L	1	0.95	5.0	50	EPA 8260B	04/15/11 00:22	JKG	
Vinyl chloride [75-01-4] ^	**0.63**	J	ug/L	1	0.60	1.0	1	EPA 8260B	04/15/11 00:22	JKG	
Xylenes (Total) [1330-20-7] ^	2.1	U	ug/L	1	2.1	3.0	5	EPA 8260B	04/15/11 00:22	JKG	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*46*	*1*	*50.0*	*91 %*	*51-122*	*1D14025*	*EPA 8260B*	*04/15/11 00:22*	*JKG*	
Dibromofluoromethane	*46*	*1*	*50.0*	*91 %*	*68-117*	*1D14025*	*EPA 8260B*	*04/15/11 00:22*	*JKG*	
Toluene-d8	*46*	*1*	*50.0*	*92 %*	*69-110*	*1D14025*	*EPA 8260B*	*04/15/11 00:22*	*JKG*	

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Description: 7601-MW10D | **Lab Sample ID:** C104061-03 | **Received:** 04/12/11 13:00

Matrix: Ground Water | **Sampled:** 04/11/11 16:12 | **Work Order:** C104061

Project: Randolph County LF | **Sampled By:** N. Rathjen

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
Calcium [7440-70-2] ^	**180000**		ug/L	1	20.0	100	NE	EPA 6010C	04/14/11 12:29	JDH	
Magnesium [7439-95-4] ^	**60700**		ug/L	1	23.0	100	NE	EPA 6010C	04/14/11 12:29	JDH	
Potassium [7440-09-7] ^	**39400**		ug/L	1	150	500	NE	EPA 6010C	04/14/11 12:29	JDH	
Sodium [7440-23-5] ^	**29800**		ug/L	1	400	500	NE	EPA 6010C	04/14/11 12:29	JDH	

Description: 7601-MW10D
Matrix: Ground Water
Project: Randolph County LF

Lab Sample ID: C104061-03
Sampled: 04/11/11 16:12
Sampled By: N. Rathjen

Received: 04/12/11 13:00
Work Order: C104061

Classical Chemistry Parameters

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Chloride [16887-00-6] ^	**270000**	BD	ug/L	5	240	25000	NE	EPA 300.0	04/14/11 10:37	CCB	QB-01
Nitrate as N [14797-55-8] ^	25	U	ug/L	1	25	100	10000	EPA 353.2	04/18/11 13:39	CCB	
Nitrate/Nitrite as N [ECL-0010] ^	25	U	ug/L	1	25	100	NE	EPA 353.2	04/17/11 20:02	CCB	
Nitrite as N [14797-65-0] ^	**5.3**	JB	ug/L	1	3.0	100	1000	EPA 353.2	04/12/11 17:16	AJB	J-01
Sulfate as SO4 [14808-79-8] ^	**35000**	J	ug/L	1	20	5000	250000	EPA 300.0	04/13/11 22:03	CCB	
Sulfide [18496-25-8] ^	10	U	ug/L	1	10	100	1000	SM18 4500-S D	04/15/11 14:17	JOC	
Total Alkalinity as CaCO3 [471-34-1] ^	**330000**	D	ug/L	2	24000	30000	NE	EPA 310.2	04/19/11 10:33	CCB	

Description: 7601-MW10D
Matrix: Ground Water
Project: Randolph County LF

Lab Sample ID: C104061-03
Sampled: 04/11/11 16:12
Sampled By: N. Rathjen

Received: 04/12/11 13:00
Work Order: C104061

Classical Chemistry Parameters

^ - ENCO Orlando certified analyte [NC 424]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Total Organic Carbon [ECL-0165] ^	**6900**		ug/L	1	270	1000	NE	SM18 5310B	04/22/11 14:24	RSA	

Description: 7601-MW10D
Matrix: Ground Water
Project: Randolph County LF

Lab Sample ID: C104061-03
Sampled: 04/11/11 16:12
Sampled By: N. Rathjen

Received: 04/12/11 13:00
Work Order: C104061

Dissolved Gases by GC

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Carbon dioxide [124-38-9]	**79000**		ug/L	1	2000	2500	NE	RSK-175	04/18/11 11:39	LAC	
Ethane [74-84-0]	1.50	U	ug/L	1	1.50	2.00	NE	RSK-175	04/18/11 11:39	LAC	
Ethene [74-85-1]	1.60	U	ug/L	1	1.60	2.00	NE	RSK-175	04/18/11 11:39	LAC	
Methane [74-82-8]	**4.30**		ug/L	1	0.490	1.00	NE	RSK-175	04/18/11 11:39	LAC	

Description: 7601-MW10D | **Lab Sample ID:** C104061-03 | **Received:** 04/12/11 13:00

Matrix: Ground Water | **Sampled:** 04/11/11 16:12 | **Work Order:** C104061

Project: Randolph County LF | **Sampled By:** N. Rathjen

Volatile Fatty Acids by HPLC

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Acetic Acid [64-19-7]	83	U	ug/L	1	83	500	NE	VGC-13	04/13/11 20:24	MEF	
Butyric Acid [107-92-6]	160	U	ug/L	1	160	500	NE	VGC-13	04/13/11 20:24	MEF	
Hexanoic Acid [142-62-1]	230	U	ug/L	1	230	1000		VGC-13	04/13/11 20:24	MEF	
HIBA (2-Hydroxyisobutyric Acid) [594-61-6]	160	U	ug/L	1	160	500		VGC-13	04/13/11 20:24	MEF	
iso-Hexanoic Acid [646-07-1]	210	U	ug/L	1	210	1000		VGC-13	04/13/11 20:24	MEF	
iso-Pentanoic Acid [503-74-2]	260	U	ug/L	1	260	500		VGC-13	04/13/11 20:24	MEF	
Lactic Acid [50-21-5]	440	U	ug/L	1	440	500	NE	VGC-13	04/13/11 20:24	MEF	
Pentanoic Acid [109-52-4]	270	U	ug/L	1	270	500		VGC-13	04/13/11 20:24	MEF	
Propionic Acid [79-09-4]	180	U	ug/L	1	180	500	NE	VGC-13	04/13/11 20:24	MEF	
Pyruvic Acid [127-17-3]	140	U	ug/L	1	140	500	NE	VGC-13	04/13/11 20:24	MEF	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
Trimethylacetic acid	*58000*	*1*	*49800*	*116 %*	*80-124*	*1D13016*	*VGC-13*	*04/13/11 20:24*	*MEF*	

Description: 7601-MW11S | **Lab Sample ID:** C104061-04 | **Received:** 04/12/11 13:00

Matrix: Ground Water | **Sampled:** 04/11/11 14:05 | **Work Order:** C104061

Project: Randolph County LF | **Sampled By:** N. Rathjen

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	04/15/11 00:51	JKG	
1,1,1-Trichloroethane [71-55-6] ^	0.65	U	ug/L	1	0.65	1.0	1	EPA 8260B	04/15/11 00:51	JKG	
1,1,2,2-Tetrachloroethane [79-34-5] ^	0.75	U	ug/L	1	0.75	1.0	3	EPA 8260B	04/15/11 00:51	JKG	
1,1,2-Trichloroethane [79-00-5] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	04/15/11 00:51	JKG	
1,1-Dichloroethane [75-34-3] ^	0.080	U	ug/L	1	0.080	1.0	5	EPA 8260B	04/15/11 00:51	JKG	
1,1-Dichloroethene [75-35-4] ^	0.60	U	ug/L	1	0.60	1.0	5	EPA 8260B	04/15/11 00:51	JKG	
1,1-Dichloropropene [563-58-6] ^	0.66	U	ug/L	1	0.66	1.0	5	EPA 8260B	04/15/11 00:51	JKG	
1,2,3-Trichloropropane [96-18-4] ^	0.72	U	ug/L	1	0.72	1.0	1	EPA 8260B	04/15/11 00:51	JKG	
1,2,4-Trichlorobenzene [120-82-1] ^	0.58	U	ug/L	1	0.58	1.0	10	EPA 8260B	04/15/11 00:51	JKG	
1,2-Dibromo-3-chloropropane [96-12-8] ^	0.48	U	ug/L	1	0.48	1.0	13	EPA 8260B	04/15/11 00:51	JKG	
1,2-Dibromoethane [106-93-4] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	04/15/11 00:51	JKG	
1,2-Dichlorobenzene [95-50-1] ^	0.11	U	ug/L	1	0.11	1.0	5	EPA 8260B	04/15/11 00:51	JKG	
1,2-Dichloroethane [107-06-2] ^	0.47	U	ug/L	1	0.47	1.0	1	EPA 8260B	04/15/11 00:51	JKG	
1,2-Dichloropropane [78-87-5] ^	0.59	U	ug/L	1	0.59	1.0	1	EPA 8260B	04/15/11 00:51	JKG	
1,3-Dichlorobenzene [541-73-1] ^	0.79	U	ug/L	1	0.79	1.0	5	EPA 8260B	04/15/11 00:51	JKG	
1,3-Dichloropropane [142-28-9] ^	0.67	U	ug/L	1	0.67	1.0	1	EPA 8260B	04/15/11 00:51	JKG	
1,4-Dichlorobenzene [106-46-7] ^	0.79	U	ug/L	1	0.79	1.0	1	EPA 8260B	04/15/11 00:51	JKG	
2,2-Dichloropropane [594-20-7] ^	0.56	U	ug/L	1	0.56	1.0	15	EPA 8260B	04/15/11 00:51	JKG	
2-Butanone [78-93-3] ^	1.3	U	ug/L	1	1.3	5.0	100	EPA 8260B	04/15/11 00:51	JKG	
2-Hexanone [591-78-6] ^	0.88	U	ug/L	1	0.88	5.0	50	EPA 8260B	04/15/11 00:51	JKG	
3-Chloropropene [107-05-1] ^	0.11	U	ug/L	1	0.11	1.0	10	EPA 8260B	04/15/11 00:51	JKG	
4-Methyl-2-pentanone [108-10-1] ^	1.1	U	ug/L	1	1.1	5.0	100	EPA 8260B	04/15/11 00:51	JKG	
Acetone [67-64-1] ^	1.2	U	ug/L	1	1.2	5.0	100	EPA 8260B	04/15/11 00:51	JKG	
Acetonitrile [75-05-8] ^	5.0	U	ug/L	1	5.0	10	55	EPA 8260B	04/15/11 00:51	JKG	
Acrolein [107-02-8] ^	4.0	U	ug/L	1	4.0	10	53	EPA 8260B	04/15/11 00:51	JKG	
Acrylonitrile [107-13-1] ^	3.5	U	ug/L	1	3.5	10	200	EPA 8260B	04/15/11 00:51	JKG	
Benzene [71-43-2] ^	0.68	U	ug/L	1	0.68	1.0	1	EPA 8260B	04/15/11 00:51	JKG	
Bromochloromethane [74-97-5] ^	0.87	U	ug/L	1	0.87	1.0	3	EPA 8260B	04/15/11 00:51	JKG	
Bromodichloromethane [75-27-4] ^	0.75	U	ug/L	1	0.75	1.0	1	EPA 8260B	04/15/11 00:51	JKG	
Bromoform [75-25-2] ^	0.68	U	ug/L	1	0.68	1.0	3	EPA 8260B	04/15/11 00:51	JKG	
Bromomethane [74-83-9] ^	0.58	U	ug/L	1	0.58	1.0	10	EPA 8260B	04/15/11 00:51	JKG	
Carbon disulfide [75-15-0] ^	1.5	U	ug/L	1	1.5	5.0	100	EPA 8260B	04/15/11 00:51	JKG	
Carbon tetrachloride [56-23-5] ^	0.69	U	ug/L	1	0.69	1.0	1	EPA 8260B	04/15/11 00:51	JKG	
Chlorobenzene [108-90-7] ^	0.74	U	ug/L	1	0.74	1.0	3	EPA 8260B	04/15/11 00:51	JKG	
Chloroethane [75-00-3] ^	0.75	U	ug/L	1	0.75	1.0	10	EPA 8260B	04/15/11 00:51	JKG	
Chloroform [67-66-3] ^	0.70	U	ug/L	1	0.70	1.0	5	EPA 8260B	04/15/11 00:51	JKG	
Chloromethane [74-87-3] ^	0.55	U	ug/L	1	0.55	1.0	1	EPA 8260B	04/15/11 00:51	JKG	
Chloroprene [126-99-8] ^	0.64	U	ug/L	1	0.64	1.0	20	EPA 8260B	04/15/11 00:51	JKG	
cis-1,2-Dichloroethene [156-59-2] ^	0.72	U	ug/L	1	0.72	1.0	5	EPA 8260B	04/15/11 00:51	JKG	
cis-1,3-Dichloropropene [10061-01-5] ^	0.075	U	ug/L	1	0.075	1.0	1	EPA 8260B	04/15/11 00:51	JKG	
Dibromochloromethane [124-48-1] ^	0.63	U	ug/L	1	0.63	1.0	3	EPA 8260B	04/15/11 00:51	JKG	
Dibromomethane [74-95-3] ^	0.90	U	ug/L	1	0.90	1.0	10	EPA 8260B	04/15/11 00:51	JKG	
Dichlorodifluoromethane [75-71-8] ^	0.56	U	ug/L	1	0.56	1.0	5	EPA 8260B	04/15/11 00:51	JKG	
Ethyl Methacrylate [97-63-2] ^	0.38	U	ug/L	1	0.38	1.0	10	EPA 8260B	04/15/11 00:51	JKG	
Ethylbenzene [100-41-4] ^	0.62	U	ug/L	1	0.62	1.0	1	EPA 8260B	04/15/11 00:51	JKG	
Iodomethane [74-88-4] ^	1.7	U	ug/L	1	1.7	5.0	10	EPA 8260B	04/15/11 00:51	JKG	

Description: 7601-MW11S | **Lab Sample ID:** C104061-04 | **Received:** 04/12/11 13:00

Matrix: Ground Water | **Sampled:** 04/11/11 14:05 | **Work Order:** C104061

Project: Randolph County LF | **Sampled By:** N. Rathjen

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
Isobutyl alcohol [78-83-1] ^	11	U	ug/L	1	11	50	100	EPA 8260B	04/15/11 00:51	JKG	
Methacrylonitrile [126-98-7] ^	4.9	U	ug/L	1	4.9	10	100	EPA 8260B	04/15/11 00:51	JKG	
Methyl Methacrylate [80-62-6] ^	0.51	U	ug/L	1	0.51	1.0	30	EPA 8260B	04/15/11 00:51	JKG	
Methylene chloride [75-09-2] ^	0.14	U	ug/L	1	0.14	1.0	1	EPA 8260B	04/15/11 00:51	JKG	
Naphthalene [91-20-3] ^	0.46	U	ug/L	1	0.46	1.0	10	EPA 8260B	04/15/11 00:51	JKG	
Propionitrile [107-12-0] ^	5.0	U	ug/L	1	5.0	10	150	EPA 8260B	04/15/11 00:51	JKG	
Styrene [100-42-5] ^	0.053	U	ug/L	1	0.053	1.0	1	EPA 8260B	04/15/11 00:51	JKG	
Tetrachloroethene [127-18-4] ^	0.73	U	ug/L	1	0.73	1.0	1	EPA 8260B	04/15/11 00:51	JKG	
Toluene [108-88-3] ^	0.85	U	ug/L	1	0.85	1.0	1	EPA 8260B	04/15/11 00:51	JKG	
trans-1,2-Dichloroethene [156-60-5] ^	0.12	U	ug/L	1	0.12	1.0	5	EPA 8260B	04/15/11 00:51	JKG	
trans-1,3-Dichloropropene [10061-02-6] ^	0.50	U	ug/L	1	0.50	1.0	1	EPA 8260B	04/15/11 00:51	JKG	
trans-1,4-Dichloro-2-butene [110-57-6] ^	0.70	U	ug/L	1	0.70	1.0	100	EPA 8260B	04/15/11 00:51	JKG	
Trichloroethene [79-01-6] ^	0.72	U	ug/L	1	0.72	1.0	1	EPA 8260B	04/15/11 00:51	JKG	
Trichlorofluoromethane [75-69-4] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	04/15/11 00:51	JKG	
Vinyl acetate [108-05-4] ^	0.95	U	ug/L	1	0.95	5.0	50	EPA 8260B	04/15/11 00:51	JKG	
Vinyl chloride [75-01-4] ^	0.60	U	ug/L	1	0.60	1.0	1	EPA 8260B	04/15/11 00:51	JKG	
Xylenes (Total) [1330-20-7] ^	2.1	U	ug/L	1	2.1	3.0	5	EPA 8260B	04/15/11 00:51	JKG	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*47*	*1*	*50.0*	*94 %*	*51-122*	*1D14025*	*EPA 8260B*	*04/15/11 00:51*	*JKG*	
Dibromofluoromethane	*44*	*1*	*50.0*	*89 %*	*68-117*	*1D14025*	*EPA 8260B*	*04/15/11 00:51*	*JKG*	
Toluene-d8	*45*	*1*	*50.0*	*89 %*	*69-110*	*1D14025*	*EPA 8260B*	*04/15/11 00:51*	*JKG*	

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Description: 7601-MW11S | **Lab Sample ID:** C104061-04 | **Received:** 04/12/11 13:00

Matrix: Ground Water | **Sampled:** 04/11/11 14:05 | **Work Order:** C104061

Project: Randolph County LF | **Sampled By:** N. Rathjen

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
Calcium [7440-70-2] ^	**5540**		ug/L	1	20.0	100	NE	EPA 6010C	04/14/11 12:31	JDH	
Magnesium [7439-95-4] ^	**1740**		ug/L	1	23.0	100	NE	EPA 6010C	04/14/11 12:31	JDH	
Potassium [7440-09-7] ^	**311**	J	ug/L	1	150	500	NE	EPA 6010C	04/14/11 12:31	JDH	
Sodium [7440-23-5] ^	**5900**		ug/L	1	400	500	NE	EPA 6010C	04/14/11 12:31	JDH	

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Description: 7601-MW11S | **Lab Sample ID:** C104061-04 | **Received:** 04/12/11 13:00

Matrix: Ground Water | **Sampled:** 04/11/11 14:05 | **Work Order:** C104061

Project: Randolph County LF | **Sampled By:** N. Rathjen

Classical Chemistry Parameters

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Chloride [16887-00-6] ^	**5300**	B	ug/L	1	47	5000	NE	EPA 300.0	04/13/11 22:41	CCB	J-01
Nitrate as N [14797-55-8] ^	25	U	ug/L	1	25	100	10000	EPA 353.2	04/18/11 13:39	CCB	
Nitrate/Nitrite as N [ECL-0010] ^	**79**	J	ug/L	1	25	100	NE	EPA 353.2	04/17/11 20:04	CCB	
Nitrite as N [14797-65-0] ^	3.0	U	ug/L	1	3.0	100	1000	EPA 353.2	04/12/11 17:17	AJB	
Sulfate as SO4 [14808-79-8] ^	**4500**	J	ug/L	1	20	5000	250000	EPA 300.0	04/13/11 22:41	CCB	
Sulfide [18496-25-8] ^	10	U	ug/L	1	10	100	1000	SM18 4500-S D	04/15/11 14:17	JOC	
Total Alkalinity as CaCO3 [471-34-1] ^	**18000**		ug/L	1	12000	15000	NE	EPA 310.2	04/19/11 10:07	CCB	

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Description: 7601-MW11S | **Lab Sample ID:** C104061-04 | **Received:** 04/12/11 13:00

Matrix: Ground Water | **Sampled:** 04/11/11 14:05 | **Work Order:** C104061

Project: Randolph County LF | **Sampled By:** N. Rathjen

Classical Chemistry Parameters

^ - ENCO Orlando certified analyte [NC 424]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Total Organic Carbon [ECL-0165] ^	**620**	J	ug/L	1	270	1000	NE	SM18 5310B	04/22/11 14:24	RSA	

Description: 7601-MW11S | **Lab Sample ID:** C104061-04 | **Received:** 04/12/11 13:00

Matrix: Ground Water | **Sampled:** 04/11/11 14:05 | **Work Order:** C104061

Project: Randolph County LF | **Sampled By:** N. Rathjen

Dissolved Gases by GC

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Carbon dioxide [124-38-9]	**53200**		ug/L	1	2000	2500	NE	RSK-175	04/18/11 11:43	LAC	
Ethane [74-84-0]	1.50	U	ug/L	1	1.50	2.00	NE	RSK-175	04/18/11 11:43	LAC	
Ethene [74-85-1]	1.60	U	ug/L	1	1.60	2.00	NE	RSK-175	04/18/11 11:43	LAC	
Methane [74-82-8]	0.490	U	ug/L	1	0.490	1.00	NE	RSK-175	04/18/11 11:43	LAC	

Description: 7601-MW11S | **Lab Sample ID:** C104061-04 | **Received:** 04/12/11 13:00

Matrix: Ground Water | **Sampled:** 04/11/11 14:05 | **Work Order:** C104061

Project: Randolph County LF | **Sampled By:** N. Rathjen

Volatile Fatty Acids by HPLC

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Acetic Acid [64-19-7]	83	U	ug/L	1	83	500	NE	VGC-13	04/13/11 21:26	MEF	
Butyric Acid [107-92-6]	160	U	ug/L	1	160	500	NE	VGC-13	04/13/11 21:26	MEF	
Hexanoic Acid [142-62-1]	230	U	ug/L	1	230	1000		VGC-13	04/13/11 21:26	MEF	
HIBA (2-Hydroxyisobutyric Acid) [594-61-6]	160	U	ug/L	1	160	500		VGC-13	04/13/11 21:26	MEF	
iso-Hexanoic Acid [646-07-1]	210	U	ug/L	1	210	1000		VGC-13	04/13/11 21:26	MEF	
iso-Pentanoic Acid [503-74-2]	260	U	ug/L	1	260	500		VGC-13	04/13/11 21:26	MEF	
Lactic Acid [50-21-5]	440	U	ug/L	1	440	500	NE	VGC-13	04/13/11 21:26	MEF	
Pentanoic Acid [109-52-4]	270	U	ug/L	1	270	500		VGC-13	04/13/11 21:26	MEF	
Propionic Acid [79-09-4]	180	U	ug/L	1	180	500	NE	VGC-13	04/13/11 21:26	MEF	
Pyruvic Acid [127-17-3]	140	U	ug/L	1	140	500	NE	VGC-13	04/13/11 21:26	MEF	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
Trimethylacetic acid	*54000*	*1*	*49800*	*108 %*	*80-124*	*1D13016*	*VGC-13*	*04/13/11 21:26*	*MEF*	

Description: 7601-MW11D | **Lab Sample ID:** C104061-05 | **Received:** 04/12/11 13:00

Matrix: Ground Water | **Sampled:** 04/11/11 12:53 | **Work Order:** C104061

Project: Randolph County LF | **Sampled By:** N. Rathjen

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	04/15/11 01:20	JKG	
1,1,1-Trichloroethane [71-55-6] ^	0.65	U	ug/L	1	0.65	1.0	1	EPA 8260B	04/15/11 01:20	JKG	
1,1,2,2-Tetrachloroethane [79-34-5] ^	0.75	U	ug/L	1	0.75	1.0	3	EPA 8260B	04/15/11 01:20	JKG	
1,1,2-Trichloroethane [79-00-5] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	04/15/11 01:20	JKG	
1,1-Dichloroethane [75-34-3] ^	0.080	U	ug/L	1	0.080	1.0	5	EPA 8260B	04/15/11 01:20	JKG	
1,1-Dichloroethene [75-35-4] ^	0.60	U	ug/L	1	0.60	1.0	5	EPA 8260B	04/15/11 01:20	JKG	
1,1-Dichloropropene [563-58-6] ^	0.66	U	ug/L	1	0.66	1.0	5	EPA 8260B	04/15/11 01:20	JKG	
1,2,3-Trichloropropane [96-18-4] ^	0.72	U	ug/L	1	0.72	1.0	1	EPA 8260B	04/15/11 01:20	JKG	
1,2,4-Trichlorobenzene [120-82-1] ^	0.58	U	ug/L	1	0.58	1.0	10	EPA 8260B	04/15/11 01:20	JKG	
1,2-Dibromo-3-chloropropane [96-12-8] ^	0.48	U	ug/L	1	0.48	1.0	13	EPA 8260B	04/15/11 01:20	JKG	
1,2-Dibromoethane [106-93-4] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	04/15/11 01:20	JKG	
1,2-Dichlorobenzene [95-50-1] ^	0.11	U	ug/L	1	0.11	1.0	5	EPA 8260B	04/15/11 01:20	JKG	
1,2-Dichloroethane [107-06-2] ^	0.47	U	ug/L	1	0.47	1.0	1	EPA 8260B	04/15/11 01:20	JKG	
1,2-Dichloropropane [78-87-5] ^	0.59	U	ug/L	1	0.59	1.0	1	EPA 8260B	04/15/11 01:20	JKG	
1,3-Dichlorobenzene [541-73-1] ^	0.79	U	ug/L	1	0.79	1.0	5	EPA 8260B	04/15/11 01:20	JKG	
1,3-Dichloropropane [142-28-9] ^	0.67	U	ug/L	1	0.67	1.0	1	EPA 8260B	04/15/11 01:20	JKG	
1,4-Dichlorobenzene [106-46-7] ^	0.79	U	ug/L	1	0.79	1.0	1	EPA 8260B	04/15/11 01:20	JKG	
2,2-Dichloropropane [594-20-7] ^	0.56	U	ug/L	1	0.56	1.0	15	EPA 8260B	04/15/11 01:20	JKG	
2-Butanone [78-93-3] ^	1.3	U	ug/L	1	1.3	5.0	100	EPA 8260B	04/15/11 01:20	JKG	
2-Hexanone [591-78-6] ^	0.88	U	ug/L	1	0.88	5.0	50	EPA 8260B	04/15/11 01:20	JKG	
3-Chloropropene [107-05-1] ^	0.11	U	ug/L	1	0.11	1.0	10	EPA 8260B	04/15/11 01:20	JKG	
4-Methyl-2-pentanone [108-10-1] ^	1.1	U	ug/L	1	1.1	5.0	100	EPA 8260B	04/15/11 01:20	JKG	
Acetone [67-64-1] ^	1.2	U	ug/L	1	1.2	5.0	100	EPA 8260B	04/15/11 01:20	JKG	
Acetonitrile [75-05-8] ^	5.0	U	ug/L	1	5.0	10	55	EPA 8260B	04/15/11 01:20	JKG	
Acrolein [107-02-8] ^	4.0	U	ug/L	1	4.0	10	53	EPA 8260B	04/15/11 01:20	JKG	
Acrylonitrile [107-13-1] ^	3.5	U	ug/L	1	3.5	10	200	EPA 8260B	04/15/11 01:20	JKG	
Benzene [71-43-2] ^	0.68	U	ug/L	1	0.68	1.0	1	EPA 8260B	04/15/11 01:20	JKG	
Bromochloromethane [74-97-5] ^	0.87	U	ug/L	1	0.87	1.0	3	EPA 8260B	04/15/11 01:20	JKG	
Bromodichloromethane [75-27-4] ^	0.75	U	ug/L	1	0.75	1.0	1	EPA 8260B	04/15/11 01:20	JKG	
Bromoform [75-25-2] ^	0.68	U	ug/L	1	0.68	1.0	3	EPA 8260B	04/15/11 01:20	JKG	
Bromomethane [74-83-9] ^	0.58	U	ug/L	1	0.58	1.0	10	EPA 8260B	04/15/11 01:20	JKG	
Carbon disulfide [75-15-0] ^	1.5	U	ug/L	1	1.5	5.0	100	EPA 8260B	04/15/11 01:20	JKG	
Carbon tetrachloride [56-23-5] ^	0.69	U	ug/L	1	0.69	1.0	1	EPA 8260B	04/15/11 01:20	JKG	
Chlorobenzene [108-90-7] ^	0.74	U	ug/L	1	0.74	1.0	3	EPA 8260B	04/15/11 01:20	JKG	
Chloroethane [75-00-3] ^	0.75	U	ug/L	1	0.75	1.0	10	EPA 8260B	04/15/11 01:20	JKG	
Chloroform [67-66-3] ^	0.70	U	ug/L	1	0.70	1.0	5	EPA 8260B	04/15/11 01:20	JKG	
Chloromethane [74-87-3] ^	0.55	U	ug/L	1	0.55	1.0	1	EPA 8260B	04/15/11 01:20	JKG	
Chloroprene [126-99-8] ^	0.64	U	ug/L	1	0.64	1.0	20	EPA 8260B	04/15/11 01:20	JKG	
cis-1,2-Dichloroethene [156-59-2] ^	0.72	U	ug/L	1	0.72	1.0	5	EPA 8260B	04/15/11 01:20	JKG	
cis-1,3-Dichloropropene [10061-01-5] ^	0.075	U	ug/L	1	0.075	1.0	1	EPA 8260B	04/15/11 01:20	JKG	
Dibromochloromethane [124-48-1] ^	0.63	U	ug/L	1	0.63	1.0	3	EPA 8260B	04/15/11 01:20	JKG	
Dibromomethane [74-95-3] ^	0.90	U	ug/L	1	0.90	1.0	10	EPA 8260B	04/15/11 01:20	JKG	
Dichlorodifluoromethane [75-71-8] ^	0.56	U	ug/L	1	0.56	1.0	5	EPA 8260B	04/15/11 01:20	JKG	
Ethyl Methacrylate [97-63-2] ^	0.38	U	ug/L	1	0.38	1.0	10	EPA 8260B	04/15/11 01:20	JKG	
Ethylbenzene [100-41-4] ^	0.62	U	ug/L	1	0.62	1.0	1	EPA 8260B	04/15/11 01:20	JKG	
Iodomethane [74-88-4] ^	1.7	U	ug/L	1	1.7	5.0	10	EPA 8260B	04/15/11 01:20	JKG	

Description: 7601-MW11D | **Lab Sample ID:** C104061-05 | **Received:** 04/12/11 13:00

Matrix: Ground Water | **Sampled:** 04/11/11 12:53 | **Work Order:** C104061

Project: Randolph County LF | **Sampled By:** N. Rathjen

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
Isobutyl alcohol [78-83-1] ^	11	U	ug/L	1	11	50	100	EPA 8260B	04/15/11 01:20	JKG	
Methacrylonitrile [126-98-7] ^	4.9	U	ug/L	1	4.9	10	100	EPA 8260B	04/15/11 01:20	JKG	
Methyl Methacrylate [80-62-6] ^	0.51	U	ug/L	1	0.51	1.0	30	EPA 8260B	04/15/11 01:20	JKG	
Methylene chloride [75-09-2] ^	0.14	U	ug/L	1	0.14	1.0	1	EPA 8260B	04/15/11 01:20	JKG	
Naphthalene [91-20-3] ^	0.46	U	ug/L	1	0.46	1.0	10	EPA 8260B	04/15/11 01:20	JKG	
Propionitrile [107-12-0] ^	5.0	U	ug/L	1	5.0	10	150	EPA 8260B	04/15/11 01:20	JKG	
Styrene [100-42-5] ^	0.053	U	ug/L	1	0.053	1.0	1	EPA 8260B	04/15/11 01:20	JKG	
Tetrachloroethene [127-18-4] ^	0.73	U	ug/L	1	0.73	1.0	1	EPA 8260B	04/15/11 01:20	JKG	
Toluene [108-88-3] ^	0.85	U	ug/L	1	0.85	1.0	1	EPA 8260B	04/15/11 01:20	JKG	
trans-1,2-Dichloroethene [156-60-5] ^	0.12	U	ug/L	1	0.12	1.0	5	EPA 8260B	04/15/11 01:20	JKG	
trans-1,3-Dichloropropene [10061-02-6] ^	0.50	U	ug/L	1	0.50	1.0	1	EPA 8260B	04/15/11 01:20	JKG	
trans-1,4-Dichloro-2-butene [110-57-6] ^	0.70	U	ug/L	1	0.70	1.0	100	EPA 8260B	04/15/11 01:20	JKG	
Trichloroethene [79-01-6] ^	0.72	U	ug/L	1	0.72	1.0	1	EPA 8260B	04/15/11 01:20	JKG	
Trichlorofluoromethane [75-69-4] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	04/15/11 01:20	JKG	
Vinyl acetate [108-05-4] ^	0.95	U	ug/L	1	0.95	5.0	50	EPA 8260B	04/15/11 01:20	JKG	
Vinyl chloride [75-01-4] ^	0.60	U	ug/L	1	0.60	1.0	1	EPA 8260B	04/15/11 01:20	JKG	
Xylenes (Total) [1330-20-7] ^	2.1	U	ug/L	1	2.1	3.0	5	EPA 8260B	04/15/11 01:20	JKG	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*46*	*1*	*50.0*	*92 %*	*51-122*	*1D14025*	*EPA 8260B*	*04/15/11 01:20*	*JKG*	
Dibromofluoromethane	*42*	*1*	*50.0*	*84 %*	*68-117*	*1D14025*	*EPA 8260B*	*04/15/11 01:20*	*JKG*	
Toluene-d8	*44*	*1*	*50.0*	*89 %*	*69-110*	*1D14025*	*EPA 8260B*	*04/15/11 01:20*	*JKG*	

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Description: 7601-MW11D | **Lab Sample ID:** C104061-05 | **Received:** 04/12/11 13:00

Matrix: Ground Water | **Sampled:** 04/11/11 12:53 | **Work Order:** C104061

Project: Randolph County LF | **Sampled By:** N. Rathjen

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
Calcium [7440-70-2] ^	**22800**		ug/L	1	20.0	100	NE	EPA 6010C	04/14/11 12:40	JDH	
Magnesium [7439-95-4] ^	**7170**		ug/L	1	23.0	100	NE	EPA 6010C	04/14/11 12:40	JDH	
Potassium [7440-09-7] ^	**994**		ug/L	1	150	500	NE	EPA 6010C	04/14/11 12:40	JDH	
Sodium [7440-23-5] ^	**12100**		ug/L	1	400	500	NE	EPA 6010C	04/14/11 12:40	JDH	

Description: 7601-MW11D
Matrix: Ground Water
Project: Randolph County LF

Lab Sample ID: C104061-05
Sampled: 04/11/11 12:53
Sampled By: N. Rathjen

Received: 04/12/11 13:00
Work Order: C104061

Classical Chemistry Parameters

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Chloride [16887-00-6] ^	**4500**	JB	ug/L	1	47	5000	NE	EPA 300.0	04/13/11 23:37	CCB	J-01
Nitrate as N [14797-55-8] ^	25	U	ug/L	1	25	100	10000	EPA 353.2	04/18/11 13:39	CCB	
Nitrate/Nitrite as N [ECL-0010] ^	25	U	ug/L	1	25	100	NE	EPA 353.2	04/17/11 20:06	CCB	
Nitrite as N [14797-65-0] ^	3.0	U	ug/L	1	3.0	100	1000	EPA 353.2	04/12/11 17:19	AJB	
Sulfate as SO4 [14808-79-8] ^	**4200**	J	ug/L	1	20	5000	250000	EPA 300.0	04/13/11 23:37	CCB	
Sulfide [18496-25-8] ^	10	U	ug/L	1	10	100	1000	SM18 4500-S D	04/15/11 14:17	JOC	
Total Alkalinity as CaCO3 [471-34-1] ^	**98000**		ug/L	1	12000	15000	NE	EPA 310.2	04/19/11 10:08	CCB	

Description: 7601-MW11D
Matrix: Ground Water
Project: Randolph County LF

Lab Sample ID: C104061-05
Sampled: 04/11/11 12:53
Sampled By: N. Rathjen

Received: 04/12/11 13:00
Work Order: C104061

Classical Chemistry Parameters

^ - ENCO Orlando certified analyte [NC 424]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Total Organic Carbon [ECL-0165] ^	**710**	J	ug/L	1	270	1000	NE	SM18 5310B	04/22/11 14:24	RSA	

Description: 7601-MW11D
Matrix: Ground Water
Project: Randolph County LF

Lab Sample ID: C104061-05
Sampled: 04/11/11 12:53
Sampled By: N. Rathjen

Received: 04/12/11 13:00
Work Order: C104061

Dissolved Gases by GC

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Carbon dioxide [124-38-9]	**13300**		ug/L	1	2000	2500	NE	RSK-175	04/18/11 11:46	LAC	
Ethane [74-84-0]	1.50	U	ug/L	1	1.50	2.00	NE	RSK-175	04/18/11 11:46	LAC	
Ethene [74-85-1]	1.60	U	ug/L	1	1.60	2.00	NE	RSK-175	04/18/11 11:46	LAC	
Methane [74-82-8]	0.490	U	ug/L	1	0.490	1.00	NE	RSK-175	04/18/11 11:46	LAC	

Description: 7601-MW11D
Matrix: Ground Water
Project: Randolph County LF

Lab Sample ID: C104061-05
Sampled: 04/11/11 12:53
Sampled By: N. Rathjen

Received: 04/12/11 13:00
Work Order: C104061

Volatile Fatty Acids by HPLC

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Acetic Acid [64-19-7]	83	U	ug/L	1	83	500	NE	VGC-13	04/13/11 22:29	MEF	
Butyric Acid [107-92-6]	160	U	ug/L	1	160	500	NE	VGC-13	04/13/11 22:29	MEF	
Hexanoic Acid [142-62-1]	230	U	ug/L	1	230	1000		VGC-13	04/13/11 22:29	MEF	
HIBA (2-Hydroxyisobutyric Acid) [594-61-6]	160	U	ug/L	1	160	500		VGC-13	04/13/11 22:29	MEF	
iso-Hexanoic Acid [646-07-1]	210	U	ug/L	1	210	1000		VGC-13	04/13/11 22:29	MEF	
iso-Pentanoic Acid [503-74-2]	260	U	ug/L	1	260	500		VGC-13	04/13/11 22:29	MEF	
Lactic Acid [50-21-5]	440	U	ug/L	1	440	500	NE	VGC-13	04/13/11 22:29	MEF	
Pentanoic Acid [109-52-4]	270	U	ug/L	1	270	500		VGC-13	04/13/11 22:29	MEF	
Propionic Acid [79-09-4]	180	U	ug/L	1	180	500	NE	VGC-13	04/13/11 22:29	MEF	
Pyruvic Acid [127-17-3]	140	U	ug/L	1	140	500	NE	VGC-13	04/13/11 22:29	MEF	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
Trimethylacetic acid	*60000*	*1*	*49800*	*120 %*	*80-124*	*1D13016*	*VGC-13*	*04/13/11 22:29*	*MEF*	

Description: 7601-MW1 **Lab Sample ID:** C104568-01 **Received:** 04/13/11 13:15

Matrix: Ground Water **Sampled:** 04/12/11 16:11 **Work Order:** C104568

Project: Randolph County LF **Sampled By:** N. Rathjen

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
Calcium [7440-70-2] ^	**89400**		ug/L	1	20.0	100	NE	EPA 6010C	04/15/11 12:04	JDH	
Magnesium [7439-95-4] ^	**33300**		ug/L	1	23.0	100	NE	EPA 6010C	04/15/11 12:04	JDH	
Potassium [7440-09-7] ^	150	U	ug/L	1	150	500	NE	EPA 6010C	04/15/11 12:04	JDH	
Sodium [7440-23-5] ^	**5610**		ug/L	1	400	500	NE	EPA 6010C	04/15/11 12:04	JDH	

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Description: 7601-MW1 **Lab Sample ID:** C104568-01 **Received:** 04/13/11 13:15

Matrix: Ground Water **Sampled:** 04/12/11 16:11 **Work Order:** C104568

Project: Randolph County LF **Sampled By:** N. Rathjen

Classical Chemistry Parameters

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Chloride [16887-00-6] ^	**74000**	B	ug/L	1	47	5000	NE	EPA 300.0	04/22/11 03:47	CCB	QB-01
Nitrate as N [14797-55-8] ^	**67**	J	ug/L	1	25	100	10000	EPA 353.2	04/18/11 13:39	CCB	
Nitrate/Nitrite as N [ECL-0010] ^	**67**	J	ug/L	1	25	100	NE	EPA 353.2	04/17/11 21:23	CCB	
Nitrite as N [14797-65-0] ^	3.0	U	ug/L	1	3.0	100	1000	EPA 353.2	04/13/11 16:24	CCB	
Sulfate as SO4 [14808-79-8] ^	**2000**	J	ug/L	1	20	5000	250000	EPA 300.0	04/22/11 03:47	CCB	
Sulfide [18496-25-8] ^	**64**	J	ug/L	1	10	100	1000	SM18 4500-S D	04/15/11 14:17	JOC	
Total Alkalinity as CaCO3 [471-34-1] ^	**330000**	D	ug/L	2	24000	30000	NE	EPA 310.2	04/19/11 10:34	CCB	

Description: 7601-MW1 **Lab Sample ID:** C104568-01 **Received:** 04/13/11 13:15
Matrix: Ground Water **Sampled:** 04/12/11 16:11 **Work Order:** C104568
Project: Randolph County LF **Sampled By:** N. Rathjen

Classical Chemistry Parameters

^ - ENCO Orlando certified analyte [NC 424]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Total Organic Carbon [ECL-0165] ^	**20000**		ug/L	1	270	1000	NE	SM18 5310B	04/25/11 14:03	RSA	

Description: 7601-MW1 **Lab Sample ID:** C104568-01 **Received:** 04/13/11 13:15

Matrix: Ground Water **Sampled:** 04/12/11 16:11 **Work Order:** C104568

Project: Randolph County LF **Sampled By:** N. Rathjen

Dissolved Gases by GC

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Carbon dioxide [124-38-9]	**440000**	D	ug/L	10	20000	25000	NE	RSK-175	04/18/11 12:38	LAC	
Ethane [74-84-0]	1.50	U	ug/L	1	1.50	2.00	NE	RSK-175	04/18/11 11:50	LAC	
Ethene [74-85-1]	**1.85**	J	ug/L	1	1.60	2.00	NE	RSK-175	04/18/11 11:50	LAC	
Methane [74-82-8]	**3340**		ug/L	1	0.490	1.00	NE	RSK-175	04/18/11 11:50	LAC	

Description: 7601-MW1 **Lab Sample ID:** C104568-01 **Received:** 04/13/11 13:15
Matrix: Ground Water **Sampled:** 04/12/11 16:11 **Work Order:** C104568
Project: Randolph County LF **Sampled By:** N. Rathjen

Volatile Fatty Acids by HPLC

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Acetic Acid [64-19-7]	**34000**		ug/L	1	83	500	NE	VGC-13	04/18/11 14:13	MEF	
Butyric Acid [107-92-6]	160	U	ug/L	1	160	500	NE	VGC-13	04/18/11 14:13	MEF	
Hexanoic Acid [142-62-1]	230	U	ug/L	1	230	1000		VGC-13	04/18/11 14:13	MEF	
HIBA (2-Hydroxyisobutyric Acid) [594-61-6]	160	U	ug/L	1	160	500		VGC-13	04/18/11 14:13	MEF	
iso-Hexanoic Acid [646-07-1]	210	U	ug/L	1	210	1000		VGC-13	04/18/11 14:13	MEF	
iso-Pentanoic Acid [503-74-2]	260	U	ug/L	1	260	500		VGC-13	04/18/11 14:13	MEF	
Lactic Acid [50-21-5]	440	U	ug/L	1	440	500	NE	VGC-13	04/18/11 14:13	MEF	
Pentanoic Acid [109-52-4]	270	U	ug/L	1	270	500		VGC-13	04/18/11 14:13	MEF	
Propionic Acid [79-09-4]	**2800**		ug/L	1	180	500	NE	VGC-13	04/18/11 14:13	MEF	
Pyruvic Acid [127-17-3]	140	U	ug/L	1	140	500	NE	VGC-13	04/18/11 14:13	MEF	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
Trimethylacetic acid	*56000*	*1*	*49800*	*112 %*	*80-124*	*1D15018*	*VGC-13*	*04/18/11 14:13*	*MEF*	

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Description: 7601-MW7 | **Lab Sample ID:** C104568-02 | **Received:** 04/13/11 13:15

Matrix: Ground Water | **Sampled:** 04/12/11 13:58 | **Work Order:** C104568

Project: Randolph County LF | **Sampled By:** N. Rathjen

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
Calcium [7440-70-2] ^	**13300**		ug/L	1	20.0	100	NE	EPA 6010C	04/15/11 12:06	JDH	
Magnesium [7439-95-4] ^	**5280**		ug/L	1	23.0	100	NE	EPA 6010C	04/15/11 12:06	JDH	
Potassium [7440-09-7] ^	**305**	J	ug/L	1	150	500	NE	EPA 6010C	04/15/11 12:06	JDH	
Sodium [7440-23-5] ^	**3580**		ug/L	1	400	500	NE	EPA 6010C	04/15/11 12:06	JDH	

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Description: 7601-MW7 | **Lab Sample ID:** C104568-02 | **Received:** 04/13/11 13:15

Matrix: Ground Water | **Sampled:** 04/12/11 13:58 | **Work Order:** C104568

Project: Randolph County LF | **Sampled By:** N. Rathjen

Classical Chemistry Parameters

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Chloride [16887-00-6] ^	**20000**	B	ug/L	1	47	5000	NE	EPA 300.0	04/22/11 04:25	CCB	QB-01
Nitrate as N [14797-55-8] ^	**3300**	J	ug/L	1	25	100	10000	EPA 353.2	04/18/11 13:39	CCB	
Nitrate/Nitrite as N [ECL-0010] ^	**3300**	D	ug/L	3	75	300	NE	EPA 353.2	04/17/11 22:10	CCB	
Nitrite as N [14797-65-0] ^	3.0	U	ug/L	1	3.0	100	1000	EPA 353.2	04/13/11 16:26	CCB	
Sulfate as SO4 [14808-79-8] ^	**2100**	J	ug/L	1	20	5000	250000	EPA 300.0	04/22/11 04:25	CCB	
Sulfide [18496-25-8] ^	10	U	ug/L	1	10	100	1000	SM18 4500-S D	04/15/11 14:17	JOC	
Total Alkalinity as CaCO3 [471-34-1] ^	**26000**		ug/L	1	12000	15000	NE	EPA 310.2	04/19/11 10:11	CCB	

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Description: 7601-MW7 | **Lab Sample ID:** C104568-02 | **Received:** 04/13/11 13:15

Matrix: Ground Water | **Sampled:** 04/12/11 13:58 | **Work Order:** C104568

Project: Randolph County LF | **Sampled By:** N. Rathjen

Classical Chemistry Parameters

^ - ENCO Orlando certified analyte [NC 424]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Total Organic Carbon [ECL-0165] ^	**1300**		ug/L	1	270	1000	NE	SM18 5310B	04/25/11 14:03	RSA	

Description: 7601-MW7 **Lab Sample ID:** C104568-02 **Received:** 04/13/11 13:15

Matrix: Ground Water **Sampled:** 04/12/11 13:58 **Work Order:** C104568

Project: Randolph County LF **Sampled By:** N. Rathjen

Dissolved Gases by GC

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Carbon dioxide [124-38-9]	**307000**	D	ug/L	10	20000	25000	NE	RSK-175	04/18/11 12:42	LAC	
Ethane [74-84-0]	1.50	U	ug/L	1	1.50	2.00	NE	RSK-175	04/18/11 11:54	LAC	
Ethene [74-85-1]	1.60	U	ug/L	1	1.60	2.00	NE	RSK-175	04/18/11 11:54	LAC	
Methane [74-82-8]	**1620**		ug/L	1	0.490	1.00	NE	RSK-175	04/18/11 11:54	LAC	

Description: 7601-MW7 | **Lab Sample ID:** C104568-02 | **Received:** 04/13/11 13:15

Matrix: Ground Water | **Sampled:** 04/12/11 13:58 | **Work Order:** C104568

Project: Randolph County LF | **Sampled By:** N. Rathjen

Volatile Fatty Acids by HPLC

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Acetic Acid [64-19-7]	83	U	ug/L	1	83	500	NE	VGC-13	04/18/11 15:16	MEF	
Butyric Acid [107-92-6]	160	U	ug/L	1	160	500	NE	VGC-13	04/18/11 15:16	MEF	
Hexanoic Acid [142-62-1]	230	U	ug/L	1	230	1000		VGC-13	04/18/11 15:16	MEF	
HIBA (2-Hydroxyisobutyric Acid) [594-61-6]	160	U	ug/L	1	160	500		VGC-13	04/18/11 15:16	MEF	
iso-Hexanoic Acid [646-07-1]	210	U	ug/L	1	210	1000		VGC-13	04/18/11 15:16	MEF	
iso-Pentanoic Acid [503-74-2]	260	U	ug/L	1	260	500		VGC-13	04/18/11 15:16	MEF	
Lactic Acid [50-21-5]	440	U	ug/L	1	440	500	NE	VGC-13	04/18/11 15:16	MEF	
Pentanoic Acid [109-52-4]	270	U	ug/L	1	270	500		VGC-13	04/18/11 15:16	MEF	
Propionic Acid [79-09-4]	180	U	ug/L	1	180	500	NE	VGC-13	04/18/11 15:16	MEF	
Pyruvic Acid [127-17-3]	140	U	ug/L	1	140	500	NE	VGC-13	04/18/11 15:16	MEF	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
Trimethylacetic acid	*55000*	*1*	*49800*	*110 %*	*80-124*	*1D15018*	*VGC-13*	*04/18/11 15:16*	*MEF*	

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Description: 7601-MW8 | **Lab Sample ID:** C104568-03 | **Received:** 04/13/11 13:15

Matrix: Ground Water | **Sampled:** 04/12/11 12:17 | **Work Order:** C104568

Project: Randolph County LF | **Sampled By:** N. Rathjen

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
Calcium [7440-70-2] ^	**25000**		ug/L	1	20.0	100	NE	EPA 6010C	04/15/11 12:08	JDH	
Magnesium [7439-95-4] ^	**4640**		ug/L	1	23.0	100	NE	EPA 6010C	04/15/11 12:08	JDH	
Potassium [7440-09-7] ^	**278**	J	ug/L	1	150	500	NE	EPA 6010C	04/15/11 12:08	JDH	
Sodium [7440-23-5] ^	**15200**		ug/L	1	400	500	NE	EPA 6010C	04/15/11 12:08	JDH	

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Description: 7601-MW8 | **Lab Sample ID:** C104568-03 | **Received:** 04/13/11 13:15

Matrix: Ground Water | **Sampled:** 04/12/11 12:17 | **Work Order:** C104568

Project: Randolph County LF | **Sampled By:** N. Rathjen

Classical Chemistry Parameters

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Chloride [16887-00-6] ^	**10000**	B	ug/L	1	47	5000	NE	EPA 300.0	04/22/11 04:43	CCB	J-01
Nitrate as N [14797-55-8] ^	**1900**	J	ug/L	1	25	100	10000	EPA 353.2	04/18/11 13:39	CCB	
Nitrate/Nitrite as N [ECL-0010] ^	**1900**		ug/L	1	25	100	NE	EPA 353.2	04/17/11 21:27	CCB	
Nitrite as N [14797-65-0] ^	3.0	U	ug/L	1	3.0	100	1000	EPA 353.2	04/13/11 16:27	CCB	
Sulfate as SO4 [14808-79-8] ^	**2100**	J	ug/L	1	20	5000	250000	EPA 300.0	04/22/11 04:43	CCB	
Sulfide [18496-25-8] ^	10	U	ug/L	1	10	100	1000	SM18 4500-S D	04/15/11 14:17	JOC	
Total Alkalinity as CaCO3 [471-34-1] ^	**88000**		ug/L	1	12000	15000	NE	EPA 310.2	04/19/11 10:12	CCB	

Description: 7601-MW8 | **Lab Sample ID:** C104568-03 | **Received:** 04/13/11 13:15

Matrix: Ground Water | **Sampled:** 04/12/11 12:17 | **Work Order:** C104568

Project: Randolph County LF | **Sampled By:** N. Rathjen

Classical Chemistry Parameters

^ - ENCO Orlando certified analyte [NC 424]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Total Organic Carbon [ECL-0165] ^	**850**	J	ug/L	1	270	1000	NE	SM18 5310B	04/25/11 14:03	RSA	

Description: 7601-MW8 **Lab Sample ID:** C104568-03 **Received:** 04/13/11 13:15

Matrix: Ground Water **Sampled:** 04/12/11 12:17 **Work Order:** C104568

Project: Randolph County LF **Sampled By:** N. Rathjen

Dissolved Gases by GC

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Carbon dioxide [124-38-9]	**62300**		ug/L	1	2000	2500	NE	RSK-175	04/18/11 11:58	LAC	
Ethane [74-84-0]	1.50	U	ug/L	1	1.50	2.00	NE	RSK-175	04/18/11 11:58	LAC	
Ethene [74-85-1]	1.60	U	ug/L	1	1.60	2.00	NE	RSK-175	04/18/11 11:58	LAC	
Methane [74-82-8]	**0.640**	J	ug/L	1	0.490	1.00	NE	RSK-175	04/18/11 11:58	LAC	

Description: 7601-MW8 **Lab Sample ID:** C104568-03 **Received:** 04/13/11 13:15

Matrix: Ground Water **Sampled:** 04/12/11 12:17 **Work Order:** C104568

Project: Randolph County LF **Sampled By:** N. Rathjen

Volatile Fatty Acids by HPLC

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Acetic Acid [64-19-7]	83	U	ug/L	1	83	500	NE	VGC-13	04/18/11 16:18	MEF	
Butyric Acid [107-92-6]	160	U	ug/L	1	160	500	NE	VGC-13	04/18/11 16:18	MEF	
Hexanoic Acid [142-62-1]	230	U	ug/L	1	230	1000		VGC-13	04/18/11 16:18	MEF	
HIBA (2-Hydroxyisobutyric Acid) [594-61-6]	160	U	ug/L	1	160	500		VGC-13	04/18/11 16:18	MEF	
iso-Hexanoic Acid [646-07-1]	210	U	ug/L	1	210	1000		VGC-13	04/18/11 16:18	MEF	
iso-Pentanoic Acid [503-74-2]	260	U	ug/L	1	260	500		VGC-13	04/18/11 16:18	MEF	
Lactic Acid [50-21-5]	440	U	ug/L	1	440	500	NE	VGC-13	04/18/11 16:18	MEF	
Pentanoic Acid [109-52-4]	270	U	ug/L	1	270	500		VGC-13	04/18/11 16:18	MEF	
Propionic Acid [79-09-4]	180	U	ug/L	1	180	500	NE	VGC-13	04/18/11 16:18	MEF	
Pyruvic Acid [127-17-3]	140	U	ug/L	1	140	500	NE	VGC-13	04/18/11 16:18	MEF	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
Trimethylacetic acid	*55000*	*1*	*49800*	*110 %*	*80-124*	*1D15018*	*VGC-13*	*04/18/11 16:18*	*MEF*	

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Description: 7601-MW9 | **Lab Sample ID:** C104568-04 | **Received:** 04/13/11 13:15

Matrix: Ground Water | **Sampled:** 04/12/11 10:33 | **Work Order:** C104568

Project: Randolph County LF | **Sampled By:** N. Rathjen

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
Calcium [7440-70-2] ^	**44700**		ug/L	1	20.0	100	NE	EPA 6010C	04/15/11 12:10	JDH	
Magnesium [7439-95-4] ^	**23400**		ug/L	1	23.0	100	NE	EPA 6010C	04/15/11 12:10	JDH	
Potassium [7440-09-7] ^	**201**	J	ug/L	1	150	500	NE	EPA 6010C	04/15/11 12:10	JDH	
Sodium [7440-23-5] ^	**25400**		ug/L	1	400	500	NE	EPA 6010C	04/15/11 12:10	JDH	

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Description: 7601-MW9 | **Lab Sample ID:** C104568-04 | **Received:** 04/13/11 13:15

Matrix: Ground Water | **Sampled:** 04/12/11 10:33 | **Work Order:** C104568

Project: Randolph County LF | **Sampled By:** N. Rathjen

Classical Chemistry Parameters

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Chloride [16887-00-6] ^	**16000**	B	ug/L	1	47	5000	NE	EPA 300.0	04/22/11 05:02	CCB	J-01
Nitrate as N [14797-55-8] ^	25	U	ug/L	1	25	100	10000	EPA 353.2	04/18/11 13:39	CCB	
Nitrate/Nitrite as N [ECL-0010] ^	25	U	ug/L	1	25	100	NE	EPA 353.2	04/17/11 21:30	CCB	
Nitrite as N [14797-65-0] ^	3.0	U	ug/L	1	3.0	100	1000	EPA 353.2	04/13/11 16:28	CCB	
Sulfate as SO4 [14808-79-8] ^	**15000**	J	ug/L	1	20	5000	250000	EPA 300.0	04/22/11 05:02	CCB	
Sulfide [18496-25-8] ^	10	U	ug/L	1	10	100	1000	SM18 4500-S D	04/15/11 14:17	JOC	
Total Alkalinity as CaCO3 [471-34-1] ^	**190000**		ug/L	1	12000	15000	NE	EPA 310.2	04/19/11 10:13	CCB	

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Description: 7601-MW9 | **Lab Sample ID:** C104568-04 | **Received:** 04/13/11 13:15

Matrix: Ground Water | **Sampled:** 04/12/11 10:33 | **Work Order:** C104568

Project: Randolph County LF | **Sampled By:** N. Rathjen

Classical Chemistry Parameters

^ - ENCO Orlando certified analyte [NC 424]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Total Organic Carbon [ECL-0165] ^	**1600**		ug/L	1	270	1000	NE	SM18 5310B	04/25/11 14:03	RSA	

Description: 7601-MW9 **Lab Sample ID:** C104568-04 **Received:** 04/13/11 13:15

Matrix: Ground Water **Sampled:** 04/12/11 10:33 **Work Order:** C104568

Project: Randolph County LF **Sampled By:** N. Rathjen

Dissolved Gases by GC

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Carbon dioxide [124-38-9]	**138000**		ug/L	1	2000	2500	NE	RSK-175	04/18/11 12:02	LAC	
Ethane [74-84-0]	1.50	U	ug/L	1	1.50	2.00	NE	RSK-175	04/18/11 12:02	LAC	
Ethene [74-85-1]	1.60	U	ug/L	1	1.60	2.00	NE	RSK-175	04/18/11 12:02	LAC	
Methane [74-82-8]	0.490	U	ug/L	1	0.490	1.00	NE	RSK-175	04/18/11 12:02	LAC	

Description: 7601-MW9 **Lab Sample ID:** C104568-04 **Received:** 04/13/11 13:15

Matrix: Ground Water **Sampled:** 04/12/11 10:33 **Work Order:** C104568

Project: Randolph County LF **Sampled By:** N. Rathjen

Volatile Fatty Acids by HPLC

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Acetic Acid [64-19-7]	83	U	ug/L	1	83	500	NE	VGC-13	04/18/11 17:21	MEF	
Butyric Acid [107-92-6]	160	U	ug/L	1	160	500	NE	VGC-13	04/18/11 17:21	MEF	
Hexanoic Acid [142-62-1]	230	U	ug/L	1	230	1000		VGC-13	04/18/11 17:21	MEF	
HIBA (2-Hydroxyisobutyric Acid) [594-61-6]	160	U	ug/L	1	160	500		VGC-13	04/18/11 17:21	MEF	
iso-Hexanoic Acid [646-07-1]	210	U	ug/L	1	210	1000		VGC-13	04/18/11 17:21	MEF	
iso-Pentanoic Acid [503-74-2]	260	U	ug/L	1	260	500		VGC-13	04/18/11 17:21	MEF	
Lactic Acid [50-21-5]	440	U	ug/L	1	440	500	NE	VGC-13	04/18/11 17:21	MEF	
Pentanoic Acid [109-52-4]	270	U	ug/L	1	270	500		VGC-13	04/18/11 17:21	MEF	
Propionic Acid [79-09-4]	180	U	ug/L	1	180	500	NE	VGC-13	04/18/11 17:21	MEF	
Pyruvic Acid [127-17-3]	140	U	ug/L	1	140	500	NE	VGC-13	04/18/11 17:21	MEF	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
Trimethylacetic acid	*55000*	*1*	*49800*	*111 %*	*80-124*	*1D15018*	*VGC-13*	*04/18/11 17:21*	*MEF*	

Description: 7601-MW2 **Lab Sample ID:** C104671-01 **Received:** 04/14/11 11:00

Matrix: Ground Water **Sampled:** 04/13/11 13:12 **Work Order:** C104671

Project: Randolph County LF **Sampled By:** N. Rathjen

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	04/20/11 00:53	JKG	
1,1,1-Trichloroethane [71-55-6] ^	0.65	U	ug/L	1	0.65	1.0	1	EPA 8260B	04/20/11 00:53	JKG	
1,1,2,2-Tetrachloroethane [79-34-5] ^	0.75	U	ug/L	1	0.75	1.0	3	EPA 8260B	04/20/11 00:53	JKG	
1,1,2-Trichloroethane [79-00-5] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	04/20/11 00:53	JKG	
1,1-Dichloroethane [75-34-3] ^	**28**		ug/L	1	0.080	1.0	5	EPA 8260B	04/20/11 00:53	JKG	
1,1-Dichloroethene [75-35-4] ^	**0.89**	J	ug/L	1	0.60	1.0	5	EPA 8260B	04/20/11 00:53	JKG	
1,1-Dichloropropene [563-58-6] ^	0.66	U	ug/L	1	0.66	1.0	5	EPA 8260B	04/20/11 00:53	JKG	
1,2,3-Trichloropropane [96-18-4] ^	0.72	U	ug/L	1	0.72	1.0	1	EPA 8260B	04/20/11 00:53	JKG	
1,2,4-Trichlorobenzene [120-82-1] ^	0.58	U	ug/L	1	0.58	1.0	10	EPA 8260B	04/20/11 00:53	JKG	
1,2-Dibromo-3-chloropropane [96-12-8] ^	0.48	U	ug/L	1	0.48	1.0	13	EPA 8260B	04/20/11 00:53	JKG	
1,2-Dibromoethane [106-93-4] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	04/20/11 00:53	JKG	
1,2-Dichlorobenzene [95-50-1] ^	0.11	U	ug/L	1	0.11	1.0	5	EPA 8260B	04/20/11 00:53	JKG	
1,2-Dichloroethane [107-06-2] ^	0.47	U	ug/L	1	0.47	1.0	1	EPA 8260B	04/20/11 00:53	JKG	
1,2-Dichloropropane [78-87-5] ^	0.59	U	ug/L	1	0.59	1.0	1	EPA 8260B	04/20/11 00:53	JKG	
1,3-Dichlorobenzene [541-73-1] ^	0.79	U	ug/L	1	0.79	1.0	5	EPA 8260B	04/20/11 00:53	JKG	
1,3-Dichloropropane [142-28-9] ^	0.67	U	ug/L	1	0.67	1.0	1	EPA 8260B	04/20/11 00:53	JKG	
1,4-Dichlorobenzene [106-46-7] ^	0.79	U	ug/L	1	0.79	1.0	1	EPA 8260B	04/20/11 00:53	JKG	
2,2-Dichloropropane [594-20-7] ^	0.56	U	ug/L	1	0.56	1.0	15	EPA 8260B	04/20/11 00:53	JKG	
2-Butanone [78-93-3] ^	1.3	U	ug/L	1	1.3	5.0	100	EPA 8260B	04/20/11 00:53	JKG	
2-Hexanone [591-78-6] ^	0.88	U	ug/L	1	0.88	5.0	50	EPA 8260B	04/20/11 00:53	JKG	
3-Chloropropene [107-05-1] ^	0.11	U	ug/L	1	0.11	1.0	10	EPA 8260B	04/20/11 00:53	JKG	
4-Methyl-2-pentanone [108-10-1] ^	1.1	U	ug/L	1	1.1	5.0	100	EPA 8260B	04/20/11 00:53	JKG	
Acetone [67-64-1] ^	1.2	U	ug/L	1	1.2	5.0	100	EPA 8260B	04/20/11 00:53	JKG	
Acetonitrile [75-05-8] ^	5.0	U	ug/L	1	5.0	10	55	EPA 8260B	04/20/11 00:53	JKG	
Acrolein [107-02-8] ^	4.0	U	ug/L	1	4.0	10	53	EPA 8260B	04/20/11 00:53	JKG	
Acrylonitrile [107-13-1] ^	3.5	U	ug/L	1	3.5	10	200	EPA 8260B	04/20/11 00:53	JKG	
Benzene [71-43-2] ^	0.68	U	ug/L	1	0.68	1.0	1	EPA 8260B	04/20/11 00:53	JKG	
Bromochloromethane [74-97-5] ^	0.87	U	ug/L	1	0.87	1.0	3	EPA 8260B	04/20/11 00:53	JKG	
Bromodichloromethane [75-27-4] ^	0.75	U	ug/L	1	0.75	1.0	1	EPA 8260B	04/20/11 00:53	JKG	
Bromoform [75-25-2] ^	0.68	U	ug/L	1	0.68	1.0	3	EPA 8260B	04/20/11 00:53	JKG	
Bromomethane [74-83-9] ^	0.58	U	ug/L	1	0.58	1.0	10	EPA 8260B	04/20/11 00:53	JKG	
Carbon disulfide [75-15-0] ^	1.5	U	ug/L	1	1.5	5.0	100	EPA 8260B	04/20/11 00:53	JKG	
Carbon tetrachloride [56-23-5] ^	0.69	U	ug/L	1	0.69	1.0	1	EPA 8260B	04/20/11 00:53	JKG	
Chlorobenzene [108-90-7] ^	0.74	U	ug/L	1	0.74	1.0	3	EPA 8260B	04/20/11 00:53	JKG	
Chloroethane [75-00-3] ^	**2.4**	J	ug/L	1	0.75	1.0	10	EPA 8260B	04/20/11 00:53	JKG	
Chloroform [67-66-3] ^	0.70	U	ug/L	1	0.70	1.0	5	EPA 8260B	04/20/11 00:53	JKG	
Chloromethane [74-87-3] ^	0.55	U	ug/L	1	0.55	1.0	1	EPA 8260B	04/20/11 00:53	JKG	
Chloroprene [126-99-8] ^	0.64	U	ug/L	1	0.64	1.0	20	EPA 8260B	04/20/11 00:53	JKG	
cis-1,2-Dichloroethene [156-59-2] ^	0.72	U	ug/L	1	0.72	1.0	5	EPA 8260B	04/20/11 00:53	JKG	
cis-1,3-Dichloropropene [10061-01-5] ^	0.075	U	ug/L	1	0.075	1.0	1	EPA 8260B	04/20/11 00:53	JKG	
Dibromochloromethane [124-48-1] ^	0.63	U	ug/L	1	0.63	1.0	3	EPA 8260B	04/20/11 00:53	JKG	
Dibromomethane [74-95-3] ^	0.90	U	ug/L	1	0.90	1.0	10	EPA 8260B	04/20/11 00:53	JKG	
Dichlorodifluoromethane [75-71-8] ^	0.56	U	ug/L	1	0.56	1.0	5	EPA 8260B	04/20/11 00:53	JKG	
Ethyl Methacrylate [97-63-2] ^	0.38	U	ug/L	1	0.38	1.0	10	EPA 8260B	04/20/11 00:53	JKG	
Ethylbenzene [100-41-4] ^	0.62	U	ug/L	1	0.62	1.0	1	EPA 8260B	04/20/11 00:53	JKG	
Iodomethane [74-88-4] ^	1.7	U	ug/L	1	1.7	5.0	10	EPA 8260B	04/20/11 00:53	JKG	

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Description: 7601-MW2 | **Lab Sample ID:** C104671-01 | **Received:** 04/14/11 11:00

Matrix: Ground Water | **Sampled:** 04/13/11 13:12 | **Work Order:** C104671

Project: Randolph County LF | **Sampled By:** N. Rathjen

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
Isobutyl alcohol [78-83-1] ^	11	U	ug/L	1	11	50	100	EPA 8260B	04/20/11 00:53	JKG	
Methacrylonitrile [126-98-7] ^	4.9	U	ug/L	1	4.9	10	100	EPA 8260B	04/20/11 00:53	JKG	
Methyl Methacrylate [80-62-6] ^	0.51	U	ug/L	1	0.51	1.0	30	EPA 8260B	04/20/11 00:53	JKG	
Methylene chloride [75-09-2] ^	**0.90**	J	ug/L	1	0.14	1.0	1	EPA 8260B	04/20/11 00:53	JKG	
Naphthalene [91-20-3] ^	0.46	U	ug/L	1	0.46	1.0	10	EPA 8260B	04/20/11 00:53	JKG	
Propionitrile [107-12-0] ^	5.0	U	ug/L	1	5.0	10	150	EPA 8260B	04/20/11 00:53	JKG	
Styrene [100-42-5] ^	0.053	U	ug/L	1	0.053	1.0	1	EPA 8260B	04/20/11 00:53	JKG	
Tetrachloroethene [127-18-4] ^	**0.74**	J	ug/L	1	0.73	1.0	1	EPA 8260B	04/20/11 00:53	JKG	
Toluene [108-88-3] ^	0.85	U	ug/L	1	0.85	1.0	1	EPA 8260B	04/20/11 00:53	JKG	
trans-1,2-Dichloroethene [156-60-5] ^	0.12	U	ug/L	1	0.12	1.0	5	EPA 8260B	04/20/11 00:53	JKG	
trans-1,3-Dichloropropene [10061-02-6] ^	0.50	U	ug/L	1	0.50	1.0	1	EPA 8260B	04/20/11 00:53	JKG	
trans-1,4-Dichloro-2-butene [110-57-6] ^	0.70	U	ug/L	1	0.70	1.0	100	EPA 8260B	04/20/11 00:53	JKG	
Trichloroethene [79-01-6] ^	0.72	U	ug/L	1	0.72	1.0	1	EPA 8260B	04/20/11 00:53	JKG	
Trichlorofluoromethane [75-69-4] ^	0.66	U	ug/L	1	0.66	1.0	1	EPA 8260B	04/20/11 00:53	JKG	
Vinyl acetate [108-05-4] ^	0.95	U	ug/L	1	0.95	5.0	50	EPA 8260B	04/20/11 00:53	JKG	
Vinyl chloride [75-01-4] ^	0.60	U	ug/L	1	0.60	1.0	1	EPA 8260B	04/20/11 00:53	JKG	
Xylenes (Total) [1330-20-7] ^	2.1	U	ug/L	1	2.1	3.0	5	EPA 8260B	04/20/11 00:53	JKG	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*45*	*1*	*50.0*	*90 %*	*51-122*	*1D19028*	*EPA 8260B*	*04/20/11 00:53*	*JKG*	
Dibromofluoromethane	*43*	*1*	*50.0*	*87 %*	*68-117*	*1D19028*	*EPA 8260B*	*04/20/11 00:53*	*JKG*	
Toluene-d8	*46*	*1*	*50.0*	*92 %*	*69-110*	*1D19028*	*EPA 8260B*	*04/20/11 00:53*	*JKG*	

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Description: 7601-MW2 | **Lab Sample ID:** C104671-01 | **Received:** 04/14/11 11:00

Matrix: Ground Water | **Sampled:** 04/13/11 13:12 | **Work Order:** C104671

Project: Randolph County LF | **Sampled By:** N. Rathjen

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
Calcium [7440-70-2] ^	**5840**		ug/L	1	20.0	100	NE	EPA 6010C	04/15/11 13:57	JDH	
Magnesium [7439-95-4] ^	**3600**		ug/L	1	23.0	100	NE	EPA 6010C	04/15/11 13:57	JDH	
Potassium [7440-09-7] ^	**445**	J	ug/L	1	150	500	NE	EPA 6010C	04/15/11 13:57	JDH	
Sodium [7440-23-5] ^	**7210**		ug/L	1	400	500	NE	EPA 6010C	04/15/11 13:57	JDH	

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Description: 7601-MW2 **Lab Sample ID:** C104671-01 **Received:** 04/14/11 11:00

Matrix: Ground Water **Sampled:** 04/13/11 13:12 **Work Order:** C104671

Project: Randolph County LF **Sampled By:** N. Rathjen

Classical Chemistry Parameters

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Chloride [16887-00-6] ^	**22000**	B	ug/L	1	47	5000	NE	EPA 300.0	04/22/11 05:21	CCB	QB-01
Nitrate as N [14797-55-8] ^	25	U	ug/L	1	25	100	10000	EPA 353.2	04/18/11 13:39	CCB	
Nitrate/Nitrite as N [ECL-0010] ^	25	U	ug/L	1	25	100	NE	EPA 353.2	04/17/11 21:31	CCB	
Nitrite as N [14797-65-0] ^	3.0	U	ug/L	1	3.0	100	1000	EPA 353.2	04/14/11 18:15	AJB	
Sulfate as SO4 [14808-79-8] ^	**6400**	J	ug/L	1	20	5000	250000	EPA 300.0	04/22/11 05:21	CCB	
Sulfide [18496-25-8] ^	10	U	ug/L	1	10	100	1000	SM18 4500-S D	04/15/11 14:17	JOC	
Total Alkalinity as CaCO3 [471-34-1] ^	12000	U	ug/L	1	12000	15000	NE	EPA 310.2	04/19/11 10:16	CCB	

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Description: 7601-MW2 | **Lab Sample ID:** C104671-01 | **Received:** 04/14/11 11:00

Matrix: Ground Water | **Sampled:** 04/13/11 13:12 | **Work Order:** C104671

Project: Randolph County LF | **Sampled By:** N. Rathjen

Classical Chemistry Parameters

^ - ENCO Orlando certified analyte [NC 424]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Total Organic Carbon [ECL-0165] ^	**6400**		ug/L	1	270	1000	NE	SM18 5310B	04/27/11 13:09	RSA	

Description: 7601-MW2 **Lab Sample ID:** C104671-01 **Received:** 04/14/11 11:00

Matrix: Ground Water **Sampled:** 04/13/11 13:12 **Work Order:** C104671

Project: Randolph County LF **Sampled By:** N. Rathjen

Dissolved Gases by GC

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Carbon dioxide [124-38-9]	**167000**		ug/L	1	2000	2500	NE	RSK-175	04/18/11 17:14	LAC	
Ethane [74-84-0]	1.50	U	ug/L	1	1.50	2.00	NE	RSK-175	04/18/11 17:14	LAC	
Ethene [74-85-1]	1.60	U	ug/L	1	1.60	2.00	NE	RSK-175	04/18/11 17:14	LAC	
Methane [74-82-8]	0.490	U	ug/L	1	0.490	1.00	NE	RSK-175	04/18/11 17:14	LAC	

Description: 7601-MW2 **Lab Sample ID:** C104671-01 **Received:** 04/14/11 11:00

Matrix: Ground Water **Sampled:** 04/13/11 13:12 **Work Order:** C104671

Project: Randolph County LF **Sampled By:** N. Rathjen

Volatile Fatty Acids by HPLC

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Acetic Acid [64-19-7]	83	U	ug/L	1	83	500	NE	VGC-13	04/18/11 18:23	MEF	
Butyric Acid [107-92-6]	160	U	ug/L	1	160	500	NE	VGC-13	04/18/11 18:23	MEF	
Hexanoic Acid [142-62-1]	230	U	ug/L	1	230	1000		VGC-13	04/18/11 18:23	MEF	
HIBA (2-Hydroxyisobutyric Acid) [594-61-6]	160	U	ug/L	1	160	500		VGC-13	04/18/11 18:23	MEF	
iso-Hexanoic Acid [646-07-1]	210	U	ug/L	1	210	1000		VGC-13	04/18/11 18:23	MEF	
iso-Pentanoic Acid [503-74-2]	260	U	ug/L	1	260	500		VGC-13	04/18/11 18:23	MEF	
Lactic Acid [50-21-5]	440	U	ug/L	1	440	500	NE	VGC-13	04/18/11 18:23	MEF	
Pentanoic Acid [109-52-4]	270	U	ug/L	1	270	500		VGC-13	04/18/11 18:23	MEF	
Propionic Acid [79-09-4]	180	U	ug/L	1	180	500	NE	VGC-13	04/18/11 18:23	MEF	
Pyruvic Acid [127-17-3]	140	U	ug/L	1	140	500	NE	VGC-13	04/18/11 18:23	MEF	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
Trimethylacetic acid	*54000*	*1*	*49800*	*110 %*	*80-124*	*1D15018*	*VGC-13*	*04/18/11 18:23*	*MEF*	

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Description: 7601-MW6 (MS/MSD) | **Lab Sample ID:** C104671-02 | **Received:** 04/14/11 11:00

Matrix: Ground Water | **Sampled:** 04/13/11 09:53 | **Work Order:** C104671

Project: Randolph County LF | **Sampled By:** N. Rathjen

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
Calcium [7440-70-2] ^	**4750**		ug/L	1	20.0	100	NE	EPA 6010C	04/15/11 12:41	JDH	
Magnesium [7439-95-4] ^	**4090**		ug/L	1	23.0	100	NE	EPA 6010C	04/15/11 12:41	JDH	
Potassium [7440-09-7] ^	**691**		ug/L	1	150	500	NE	EPA 6010C	04/15/11 12:41	JDH	
Sodium [7440-23-5] ^	**7470**		ug/L	1	400	500	NE	EPA 6010C	04/15/11 12:41	JDH	

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Description: 7601-MW6 (MS/MSD) | **Lab Sample ID:** C104671-02 | **Received:** 04/14/11 11:00

Matrix: Ground Water | **Sampled:** 04/13/11 09:53 | **Work Order:** C104671

Project: Randolph County LF | **Sampled By:** N. Rathjen

Classical Chemistry Parameters

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Chloride [16887-00-6] ^	**5000**	B	ug/L	1	47	5000	NE	EPA 300.0	04/22/11 06:17	CCB	J-01
Nitrate as N [14797-55-8] ^	**3400**	J	ug/L	1	25	100	10000	EPA 353.2	04/18/11 13:39	CCB	
Nitrate/Nitrite as N [ECL-0010] ^	**3400**		ug/L	1	100	400	NE	EPA 353.2	04/17/11 22:11	CCB	
Nitrite as N [14797-65-0] ^	**6.9**	JB	ug/L	1	3.0	100	1000	EPA 353.2	04/14/11 18:10	AJB	J-01
Sulfate as SO4 [14808-79-8] ^	**4300**	J	ug/L	1	20	5000	250000	EPA 300.0	04/22/11 06:17	CCB	
Sulfide [18496-25-8] ^	10	U	ug/L	1	10	100	1000	SM18 4500-S D	04/15/11 14:17	JOC	
Total Alkalinity as CaCO3 [471-34-1] ^	**23000**		ug/L	1	12000	15000	NE	EPA 310.2	04/19/11 10:16	CCB	

Description: 7601-MW6 (MS/MSD) | **Lab Sample ID:** C104671-02 | **Received:** 04/14/11 11:00

Matrix: Ground Water | **Sampled:** 04/13/11 09:53 | **Work Order:** C104671

Project: Randolph County LF | **Sampled By:** N. Rathjen

Classical Chemistry Parameters

^ - ENCO Orlando certified analyte [NC 424]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Total Organic Carbon [ECL-0165] ^	**1000**		ug/L	1	270	1000	NE	SM18 5310B	04/27/11 13:09	RSA	

Description: 7601-MW6 (MS/MSD) **Lab Sample ID:** C104671-02 **Received:** 04/14/11 11:00

Matrix: Ground Water **Sampled:** 04/13/11 09:53 **Work Order:** C104671

Project: Randolph County LF **Sampled By:** N. Rathjen

Dissolved Gases by GC

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Carbon dioxide [124-38-9]	**65000**		ug/L	1	2000	2500	NE	RSK-175	04/18/11 17:17	LAC	
Ethane [74-84-0]	1.50	U	ug/L	1	1.50	2.00	NE	RSK-175	04/18/11 17:17	LAC	
Ethene [74-85-1]	1.60	U	ug/L	1	1.60	2.00	NE	RSK-175	04/18/11 17:17	LAC	
Methane [74-82-8]	0.490	U	ug/L	1	0.490	1.00	NE	RSK-175	04/18/11 17:17	LAC	

Description: 7601-MW6 (MS/MSD) | **Lab Sample ID:** C104671-02 | **Received:** 04/14/11 11:00

Matrix: Ground Water | **Sampled:** 04/13/11 09:53 | **Work Order:** C104671

Project: Randolph County LF | **Sampled By:** N. Rathjen

Volatile Fatty Acids by HPLC

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	NC SWSL	Method	Analyzed	By	Notes
Acetic Acid [64-19-7]	83	U	ug/L	1	83	500	NE	VGC-13	04/18/11 19:26	MEF	
Butyric Acid [107-92-6]	160	U	ug/L	1	160	500	NE	VGC-13	04/18/11 19:26	MEF	
Hexanoic Acid [142-62-1]	230	U	ug/L	1	230	1000		VGC-13	04/18/11 19:26	MEF	
HIBA (2-Hydroxyisobutyric Acid) [594-61-6]	160	U	ug/L	1	160	500		VGC-13	04/18/11 19:26	MEF	
iso-Hexanoic Acid [646-07-1]	210	U	ug/L	1	210	1000		VGC-13	04/18/11 19:26	MEF	
iso-Pentanoic Acid [503-74-2]	260	U	ug/L	1	260	500		VGC-13	04/18/11 19:26	MEF	
Lactic Acid [50-21-5]	440	U	ug/L	1	440	500	NE	VGC-13	04/18/11 19:26	MEF	
Pentanoic Acid [109-52-4]	270	U	ug/L	1	270	500		VGC-13	04/18/11 19:26	MEF	
Propionic Acid [79-09-4]	180	U	ug/L	1	180	500	NE	VGC-13	04/18/11 19:26	MEF	
Pyruvic Acid [127-17-3]	140	U	ug/L	1	140	500	NE	VGC-13	04/18/11 19:26	MEF	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
Trimethylacetic acid	*58000*	*1*	*49800*	*116 %*	*80-124*	*1D15018*	*VGC-13*	*04/18/11 19:26*	*MEF*	

QUALITY CONTROL

Volatile Organic Compounds by GCMS - Quality Control

Batch 1D14025 - EPA 5030B_MS

Blank (1D14025-BLK1) Prepared: 04/14/2011 12:16 Analyzed: 04/14/2011 17:07

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							
1,1-Dichloropropene	0.66	U	1.0	ug/L							
1,2,3-Trichloropropane	0.72	U	1.0	ug/L							
1,2,4-Trichlorobenzene	0.58	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							
1,3-Dichlorobenzene	0.79	U	1.0	ug/L							
1,3-Dichloropropane	0.67	U	1.0	ug/L							
1,4-Dichlorobenzene	0.79	U	1.0	ug/L							
2,2-Dichloropropane	0.56	U	1.0	ug/L							
2-Butanone	1.3	U	5.0	ug/L							
2-Hexanone	0.88	U	5.0	ug/L							
3-Chloropropene	0.11	U	1.0	ug/L							
4-Methyl-2-pentanone	1.1	U	5.0	ug/L							
Acetone	1.2	U	5.0	ug/L							
Acetonitrile	5.0	U	10	ug/L							
Acrolein	4.0	U	10	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							
Chloroprene	0.64	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							
Dichlorodifluoromethane	0.56	U	1.0	ug/L							
Ethyl Methacrylate	0.38	U	1.0	ug/L							
Ethylbenzene	0.62	U	1.0	ug/L							
Iodomethane	1.7	U	5.0	ug/L							
Isobutyl alcohol	11	U	50	ug/L							
Methacrylonitrile	4.9	U	10	ug/L							
Methyl Methacrylate	0.51	U	1.0	ug/L							

QUALITY CONTROL

Volatile Organic Compounds by GCMS - Quality Control

Batch 1D14025 - EPA 5030B_MS

Blank (1D14025-BLK1) Continued Prepared: 04/14/2011 12:16 Analyzed: 04/14/2011 17:07

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Methylene chloride	0.14	U	1.0	ug/L							
Naphthalene	0.46	U	1.0	ug/L							
Propionitrile	5.0	U	10	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	*46*			*ug/L*	*50.0*		*93*	*51-122*			
Surrogate: Dibromofluoromethane	*43*			*ug/L*	*50.0*		*86*	*68-117*			
Surrogate: Toluene-d8	*44*			*ug/L*	*50.0*		*88*	*69-110*			

LCS (1D14025-BS1) Prepared: 04/14/2011 12:16 Analyzed: 04/14/2011 17:36

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		101	75-133			
Benzene	20		1.0	ug/L	20.0		99	81-134			
Chlorobenzene	22		1.0	ug/L	20.0		109	83-117			
Toluene	21		1.0	ug/L	20.0		106	71-118			
Trichloroethene	21		1.0	ug/L	20.0		107	75-115			

Matrix Spike (1D14025-MS1) Prepared: 04/14/2011 12:16 Analyzed: 04/14/2011 18:05

Source: C104496-07

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	0.60 U	91	75-133			
Benzene	20		1.0	ug/L	20.0	0.68 U	99	81-134			
Chlorobenzene	21		1.0	ug/L	20.0	0.74 U	107	83-117			
Toluene	21		1.0	ug/L	20.0	0.85 U	105	71-118			
Trichloroethene	21		1.0	ug/L	20.0	0.72 U	107	75-115			

Matrix Spike Dup (1D14025-MSD1) Prepared: 04/14/2011 12:16 Analyzed: 04/14/2011 18:34

Source: C104496-07

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	97	75-133	6	20	
Benzene	19		1.0	ug/L	20.0	0.68 U	93	81-134	6	17	
Chlorobenzene	20		1.0	ug/L	20.0	0.74 U	101	83-117	6	16	
Toluene	19		1.0	ug/L	20.0	0.85 U	97	71-118	7	17	
Trichloroethene	20		1.0	ug/L	20.0	0.72 U	101	75-115	6	18	

QUALITY CONTROL

Volatile Organic Compounds by GCMS - Quality Control

Batch 1D19028 - EPA 5030B_MS

Blank (1D19028-BLK1) Prepared: 04/19/2011 12:22 Analyzed: 04/19/2011 21:58

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							
1,1-Dichloropropene	0.66	U	1.0	ug/L							
1,2,3-Trichloropropane	0.72	U	1.0	ug/L							
1,2,4-Trichlorobenzene	0.58	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							
1,3-Dichlorobenzene	0.79	U	1.0	ug/L							
1,3-Dichloropropane	0.67	U	1.0	ug/L							
1,4-Dichlorobenzene	0.79	U	1.0	ug/L							
2,2-Dichloropropane	0.56	U	1.0	ug/L							
2-Butanone	1.3	U	5.0	ug/L							
2-Hexanone	0.88	U	5.0	ug/L							
3-Chloropropene	0.11	U	1.0	ug/L							
4-Methyl-2-pentanone	1.1	U	5.0	ug/L							
Acetone	1.2	U	5.0	ug/L							
Acetonitrile	5.0	U	10	ug/L							
Acrolein	4.0	U	10	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							
Chloroprene	0.64	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							
Dichlorodifluoromethane	0.56	U	1.0	ug/L							
Ethyl Methacrylate	0.38	U	1.0	ug/L							
Ethylbenzene	0.62	U	1.0	ug/L							
Iodomethane	1.7	U	5.0	ug/L							
Isobutyl alcohol	11	U	50	ug/L							
Methacrylonitrile	4.9	U	10	ug/L							
Methyl Methacrylate	0.51	U	1.0	ug/L							

QUALITY CONTROL

Volatile Organic Compounds by GCMS - Quality Control

Batch 1D19028 - EPA 5030B_MS

Blank (1D19028-BLK1) Continued Prepared: 04/19/2011 12:22 Analyzed: 04/19/2011 21:58

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Methylene chloride	0.14	U	1.0	ug/L							
Naphthalene	0.46	U	1.0	ug/L							
Propionitrile	5.0	U	10	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	*46*			*ug/L*	*50.0*		*92*	*51-122*			
Surrogate: Dibromofluoromethane	*44*			*ug/L*	*50.0*		*89*	*68-117*			
Surrogate: Toluene-d8	*45*			*ug/L*	*50.0*		*90*	*69-110*			

LCS (1D19028-BS1) Prepared: 04/19/2011 12:22 Analyzed: 04/19/2011 22:27

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		101	75-133			
Benzene	21		1.0	ug/L	20.0		103	81-134			
Chlorobenzene	20		1.0	ug/L	20.0		102	83-117			
Toluene	21		1.0	ug/L	20.0		104	71-118			
Trichloroethene	21		1.0	ug/L	20.0		105	75-115			

Matrix Spike (1D19028-MS1) Prepared: 04/19/2011 12:22 Analyzed: 04/19/2011 22:56

Source: C104715-08

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	108	75-133			
Benzene	21		1.0	ug/L	20.0	0.68 U	103	81-134			
Chlorobenzene	20		1.0	ug/L	20.0	0.74 U	102	83-117			
Toluene	21		1.0	ug/L	20.0	0.85 U	103	71-118			
Trichloroethene	20		1.0	ug/L	20.0	0.72 U	101	75-115			

Matrix Spike Dup (1D19028-MSD1) Prepared: 04/19/2011 12:22 Analyzed: 04/19/2011 23:26

Source: C104715-08

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	103	75-133	5	20	
Benzene	20		1.0	ug/L	20.0	0.68 U	98	81-134	6	17	
Chlorobenzene	21		1.0	ug/L	20.0	0.74 U	103	83-117	0.9	16	
Toluene	20		1.0	ug/L	20.0	0.85 U	101	71-118	2	17	
Trichloroethene	20		1.0	ug/L	20.0	0.72 U	102	75-115	0.4	18	

QUALITY CONTROL

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

Batch 1D13013 - EPA 3005A

Blank (1D13013-BLK1) Prepared: 04/13/2011 10:02 Analyzed: 04/14/2011 11:46

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Calcium	20.0	U	100	ug/L							
Magnesium	23.0	U	100	ug/L							
Potassium	150	U	500	ug/L							
Sodium	400	U	500	ug/L							

LCS (1D13013-BS1) Prepared: 04/13/2011 10:02 Analyzed: 04/14/2011 11:48

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Calcium	5090		100	ug/L	5000		102	80-120			
Magnesium	4920		100	ug/L	5000		98	80-120			
Potassium	24800		500	ug/L	25000		99	80-120			
Sodium	25000		500	ug/L	25000		100	80-120			

Matrix Spike (1D13013-MS1) Prepared: 04/13/2011 10:02 Analyzed: 04/14/2011 11:56

Source: C104062-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Calcium	72000		100	ug/L	5000	69200	56	75-125			QM-07
Magnesium	73200		100	ug/L	5000	69300	77	75-125			
Potassium	25400		500	ug/L	25000	350	100	75-125			
Sodium	43100		500	ug/L	25000	19000	96	75-125			

Matrix Spike Dup (1D13013-MSD1) Prepared: 04/13/2011 10:02 Analyzed: 04/14/2011 11:57

Source: C104062-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Calcium	71000		100	ug/L	5000	69200	37	75-125	1	20	QM-07
Magnesium	73800		100	ug/L	5000	69300	90	75-125	0.9	20	
Potassium	25100		500	ug/L	25000	350	99	75-125	1	20	
Sodium	42600		500	ug/L	25000	19000	94	75-125	1	20	

Post Spike (1D13013-PS1) Prepared: 04/13/2011 10:02 Analyzed: 04/14/2011 11:59

Source: C104062-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Calcium	73.8		0.100	mg/L	10.0	69.2	47	80-120			QM-07
Magnesium	76.4		0.100	mg/L	10.0	69.3	70	80-120			QM-08
Potassium	47.5		0.500	mg/L	50.0	0.350	94	80-120			
Sodium	64.1		0.500	mg/L	50.0	19.0	90	80-120			

Batch 1D13039 - EPA 3005A

Blank (1D13039-BLK1) Prepared: 04/13/2011 16:00 Analyzed: 04/15/2011 11:14

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Calcium	20.0	U	100	ug/L							
Magnesium	23.0	U	100	ug/L							

QUALITY CONTROL

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

Batch 1D13039 - EPA 3005A

Blank (1D13039-BLK1) Continued Prepared: 04/13/2011 16:00 Analyzed: 04/15/2011 11:14

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Potassium	150	U	500	ug/L							
Sodium	400	U	500	ug/L							

LCS (1D13039-BS1) Prepared: 04/13/2011 16:00 Analyzed: 04/15/2011 11:17

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Calcium	5240		100	ug/L	5000		105	80-120			
Magnesium	5020		100	ug/L	5000		100	80-120			
Potassium	25500		500	ug/L	25000		102	80-120			
Sodium	25600		500	ug/L	25000		102	80-120			

Matrix Spike (1D13039-MS1) Prepared: 04/13/2011 16:00 Analyzed: 04/15/2011 11:27

Source: C104569-02

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Calcium	16200		100	ug/L	5000	11600	94	75-125			
Magnesium	9560		100	ug/L	5000	4810	95	75-125			
Potassium	25700		500	ug/L	25000	346	101	75-125			
Sodium	28900		500	ug/L	25000	3310	102	75-125			

Matrix Spike Dup (1D13039-MSD1) Prepared: 04/13/2011 16:00 Analyzed: 04/15/2011 11:29

Source: C104569-02

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Calcium	16200		100	ug/L	5000	11600	92	75-125	0.6	20	
Magnesium	9650		100	ug/L	5000	4810	97	75-125	1	20	
Potassium	25600		500	ug/L	25000	346	101	75-125	0.1	20	
Sodium	28900		500	ug/L	25000	3310	102	75-125	0.06	20	

Post Spike (1D13039-PS1) Prepared: 04/13/2011 16:00 Analyzed: 04/15/2011 11:31

Source: C104569-02

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Calcium	20.4		0.100	mg/L	10.0	11.6	88	80-120			
Magnesium	14.1		0.100	mg/L	10.0	4.81	93	80-120			
Potassium	48.2		0.500	mg/L	50.0	0.346	96	80-120			
Sodium	51.3		0.500	mg/L	50.0	3.31	96	80-120			

Batch 1D14030 - EPA 3005A

Blank (1D14030-BLK1) Prepared: 04/14/2011 13:42 Analyzed: 04/15/2011 12:36

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Calcium	20.0	U	100	ug/L							
Magnesium	23.0	U	100	ug/L							
Potassium	150	U	500	ug/L							
Sodium	400	U	500	ug/L							

QUALITY CONTROL

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

Batch 1D14030 - EPA 3005A

LCS (1D14030-BS1) Prepared: 04/14/2011 13:42 Analyzed: 04/15/2011 12:39

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Calcium	5370		100	ug/L	5000		107	80-120			
Magnesium	5100		100	ug/L	5000		102	80-120			
Potassium	26000		500	ug/L	25000		104	80-120			
Sodium	26300		500	ug/L	25000		105	80-120			

Matrix Spike (1D14030-MS1) Prepared: 04/14/2011 13:42 Analyzed: 04/15/2011 12:44

Source: C104671-02

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Calcium	9590		100	ug/L	5000	4750	97	75-125			
Magnesium	8940		100	ug/L	5000	4090	97	75-125			
Potassium	26100		500	ug/L	25000	691	102	75-125			
Sodium	32900		500	ug/L	25000	7470	102	75-125			

Matrix Spike Dup (1D14030-MSD1) Prepared: 04/14/2011 13:42 Analyzed: 04/15/2011 12:46

Source: C104671-02

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Calcium	9730		100	ug/L	5000	4750	100	75-125	1	20	
Magnesium	9000		100	ug/L	5000	4090	98	75-125	0.7	20	
Potassium	26200		500	ug/L	25000	691	102	75-125	0.4	20	
Sodium	33100		500	ug/L	25000	7470	102	75-125	0.6	20	

Post Spike (1D14030-PS1) Prepared: 04/14/2011 13:42 Analyzed: 04/15/2011 12:59

Source: C104671-02

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Calcium	14.3		0.100	mg/L	10.0	4.75	96	80-120			
Magnesium	13.5		0.100	mg/L	10.0	4.09	94	80-120			
Potassium	49.5		0.500	mg/L	50.0	0.691	98	80-120			
Sodium	56.3		0.500	mg/L	50.0	7.47	98	80-120			

Classical Chemistry Parameters - Quality Control

Batch 1D12026 - NO PREP

Blank (1D12026-BLK1) Prepared: 04/12/2011 12:06 Analyzed: 04/12/2011 13:06

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Nitrite as N	**3.8**	**J**	100	ug/L							

LCS (1D12026-BS1) Prepared: 04/12/2011 12:06 Analyzed: 04/12/2011 13:07

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Nitrite as N	1.0	B	0.10	mg/L	1.00		104	90-110			

QUALITY CONTROL

Classical Chemistry Parameters - Quality Control

Batch 1D12026 - NO PREP

Matrix Spike (1D12026-MS1) Prepared: 04/12/2011 12:06 Analyzed: 04/12/2011 13:10

Source: C102103-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Nitrite as N	1.0	B	0.10	mg/L	1.00	0.012	101	90-110			

Matrix Spike Dup (1D12026-MSD1) Prepared: 04/12/2011 12:06 Analyzed: 04/12/2011 13:11

Source: C102103-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Nitrite as N	1.0	B	0.10	mg/L	1.00	0.012	103	90-110	2	10	

Batch 1D13005 - NO PREP

Blank (1D13005-BLK1) Prepared & Analyzed: 04/13/2011 12:25

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Chloride	**1900**	**J**	5000	ug/L							
Sulfate as SO4	20	U	5000	ug/L							

LCS (1D13005-BS1) Prepared & Analyzed: 04/13/2011 12:43

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Chloride	51	B	5.0	mg/L	50.0		103	90-110			
Sulfate as SO4	47		5.0	mg/L	50.0		94	90-110			

Matrix Spike (1D13005-MS2) Prepared & Analyzed: 04/13/2011 13:39

Source: C102785-04RE1

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Chloride	55	B	5.0	mg/L	20.0	33	109	90-110			
Sulfate as SO4	24		5.0	mg/L	20.0	7.1	86	90-110			QM-05

Matrix Spike Dup (1D13005-MSD2) Prepared & Analyzed: 04/13/2011 13:58

Source: C102785-04RE1

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Chloride	55	B	5.0	mg/L	20.0	33	108	90-110	0.2	10	
Sulfate as SO4	24		5.0	mg/L	20.0	7.1	87	90-110	0.1	10	QM-05

Batch 1D13031 - NO PREP

Blank (1D13031-BLK1) Prepared: 04/13/2011 14:29 Analyzed: 04/13/2011 16:07

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Nitrite as N	3.0	U	100	ug/L							

LCS (1D13031-BS1) Prepared: 04/13/2011 14:29 Analyzed: 04/13/2011 16:08

QUALITY CONTROL

Classical Chemistry Parameters - Quality Control

Batch 1D13031 - NO PREP

LCS (1D13031-BS1) Continued Prepared: 04/13/2011 14:29 Analyzed: 04/13/2011 16:08

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Nitrite as N	1.0		0.10	mg/L	1.00		104	90-110			

Matrix Spike (1D13031-MS1) Prepared: 04/13/2011 14:29 Analyzed: 04/13/2011 16:24

Source: C104568-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Nitrite as N	0.86		0.10	mg/L	1.00	0.0014	85	90-110			QM-05

Matrix Spike Dup (1D13031-MSD1) Prepared: 04/13/2011 14:29 Analyzed: 04/13/2011 16:25

Source: C104568-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Nitrite as N	0.87		0.10	mg/L	1.00	0.0014	87	90-110	2	10	QM-05

Batch 1D14035 - NO PREP

Blank (1D14035-BLK1) Prepared: 04/14/2011 18:04 Analyzed: 04/14/2011 18:04

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Nitrite as N	**3.1**	**J**	100	ug/L							

LCS (1D14035-BS1) Prepared: 04/14/2011 18:05 Analyzed: 04/14/2011 18:05

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Nitrite as N	1.0	B	0.10	mg/L	1.00		101	90-110			

Matrix Spike (1D14035-MS1) Prepared: 04/14/2011 18:11 Analyzed: 04/14/2011 18:11

Source: C104671-02

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Nitrite as N	0.99	B	0.10	mg/L	1.00	0.0069	99	90-110			

Matrix Spike Dup (1D14035-MSD1) Prepared: 04/14/2011 18:12 Analyzed: 04/14/2011 18:12

Source: C104671-02

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Nitrite as N	1.0	B	0.10	mg/L	1.00	0.0069	102	90-110	3	10	

Batch 1D15021 - NO PREP

Blank (1D15021-BLK1) Prepared: 04/15/2011 13:23 Analyzed: 04/15/2011 14:17

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Sulfide	10	U	100	ug/L							

LCS (1D15021-BS1) Prepared: 04/15/2011 13:23 Analyzed: 04/15/2011 14:17

QUALITY CONTROL

Classical Chemistry Parameters - Quality Control

Batch 1D15021 - NO PREP

LCS (1D15021-BS1) Continued Prepared: 04/15/2011 13:23 Analyzed: 04/15/2011 14:17

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Sulfide	0.41		0.10	mg/L	0.401		103	80-120			

Matrix Spike (1D15021-MS1) Prepared: 04/15/2011 13:23 Analyzed: 04/15/2011 14:17

Source: C104671-02

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Sulfide	0.29		0.10	mg/L	0.401	0.010 U	72	80-120			QM-05

Matrix Spike (1D15021-MS2) Prepared: 04/15/2011 13:23 Analyzed: 04/15/2011 14:17

Source: C104569-02

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Sulfide	0.28		0.10	mg/L	0.401	0.010 U	70	80-120			QM-05

Matrix Spike Dup (1D15021-MSD1) Prepared: 04/15/2011 13:23 Analyzed: 04/15/2011 14:17

Source: C104671-02

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Sulfide	0.29		0.10	mg/L	0.401	0.010 U	73	80-120	0.9	25	QM-05

Matrix Spike Dup (1D15021-MSD2) Prepared: 04/15/2011 13:23 Analyzed: 04/15/2011 14:17

Source: C104569-02

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Sulfide	0.28		0.10	mg/L	0.401	0.010 U	70	80-120	0.5	25	QM-05

Batch 1D17002 - NO PREP

Blank (1D17002-BLK1) Prepared: 04/17/2011 17:04 Analyzed: 04/17/2011 19:24

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Nitrate/Nitrite as N	25	U	100	ug/L							

LCS (1D17002-BS1) Prepared: 04/17/2011 17:04 Analyzed: 04/17/2011 19:27

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Nitrate/Nitrite as N	1.4		0.10	mg/L	1.25		108	90-110			

Matrix Spike (1D17002-MS1) Prepared: 04/17/2011 17:04 Analyzed: 04/17/2011 19:31

Source: C103010-15

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Nitrate/Nitrite as N	0.54		0.10	mg/L	0.513	0.025 U	105	90-110			

Matrix Spike Dup (1D17002-MSD1) Prepared: 04/17/2011 17:04 Analyzed: 04/17/2011 19:33

Source: C103010-15

QUALITY CONTROL

Classical Chemistry Parameters - Quality Control

Batch 1D17002 - NO PREP

Matrix Spike Dup (1D17002-MSD1) Continued Prepared: 04/17/2011 17:04 Analyzed: 04/17/2011 19:33

Source: C103010-15

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Nitrate/Nitrite as N	0.58		0.10	mg/L	0.513	0.025 U	113	90-110	7	10	QM-05

Batch 1D17003 - NO PREP

Blank (1D17003-BLK1) Prepared: 04/17/2011 17:06 Analyzed: 04/17/2011 20:26

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Nitrate/Nitrite as N	25	U	100	ug/L							

LCS (1D17003-BS1) Prepared: 04/17/2011 17:06 Analyzed: 04/17/2011 20:28

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Nitrate/Nitrite as N	1.3		0.10	mg/L	1.25		108	90-110			

Matrix Spike (1D17003-MS1) Prepared: 04/17/2011 17:06 Analyzed: 04/17/2011 22:12

Source: C104671-02RE1

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Nitrate/Nitrite as N	1.4		0.10	mg/L	0.500	0.85	105	90-110			

Matrix Spike Dup (1D17003-MSD1) Prepared: 04/17/2011 17:06 Analyzed: 04/17/2011 22:13

Source: C104671-02RE1

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Nitrate/Nitrite as N	1.4		0.10	mg/L	0.500	0.85	112	90-110	2	10	QM-05

Batch 1D19009 - NO PREP

Blank (1D19009-BLK1) Prepared: 04/19/2011 08:47 Analyzed: 04/19/2011 09:54

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Total Alkalinity as CaCO3	12000	U	15000	ug/L							

LCS (1D19009-BS1) Prepared: 04/19/2011 08:47 Analyzed: 04/19/2011 09:55

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Total Alkalinity as CaCO3	100		15	mg/L	100		101	80-120			

Matrix Spike (1D19009-MS1) Prepared: 04/19/2011 08:47 Analyzed: 04/19/2011 10:17

Source: C104671-02

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Total Alkalinity as CaCO3	58		15	mg/L	40.5	23	87	80-120			

Matrix Spike Dup (1D19009-MSD1) Prepared: 04/19/2011 08:47 Analyzed: 04/19/2011 10:18

QUALITY CONTROL

Classical Chemistry Parameters - Quality Control

Batch 1D19009 - NO PREP

Matrix Spike Dup (1D19009-MSD1) Continued Prepared: 04/19/2011 08:47 Analyzed: 04/19/2011 10:18

Source: C104671-02

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Total Alkalinity as CaCO3	55		15	mg/L	40.5	23	79	80-120	6	25	QM-05

Batch 1D21004 - NO PREP

Blank (1D21004-BLK1) Prepared: 04/21/2011 03:53 Analyzed: 04/21/2011 20:19

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Chloride	**1900**	**J**	5000	ug/L							
Sulfate as SO4	20	U	5000	ug/L							

LCS (1D21004-BS1) Prepared: 04/21/2011 03:53 Analyzed: 04/21/2011 20:38

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Chloride	52	B	5.0	mg/L	50.0		104	90-110			
Sulfate as SO4	48		5.0	mg/L	50.0		95	90-110			

Matrix Spike (1D21004-MS1) Prepared: 04/21/2011 03:53 Analyzed: 04/21/2011 20:57

Source: C104671-02

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Chloride	24	B	5.0	mg/L	20.0	5.0	96	90-110			
Sulfate as SO4	21		5.0	mg/L	20.0	4.3	86	90-110			QM-05

Matrix Spike Dup (1D21004-MSD1) Prepared: 04/21/2011 03:53 Analyzed: 04/21/2011 21:15

Source: C104671-02

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Chloride	25	B	5.0	mg/L	20.0	5.0	98	90-110	2	10	
Sulfate as SO4	22		5.0	mg/L	20.0	4.3	86	90-110	0.4	10	QM-05

QUALITY CONTROL

Dissolved Gases by GC - Quality Control

Batch 1D15009 - NO PREP ANALYTIX

Blank (1D15009-BLK1) Prepared: 04/15/2011 09:27 Analyzed: 04/18/2011 10:51

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Carbon dioxide	2000	U	2500	ug/L							
Ethane	1.50	U	2.00	ug/L							
Ethene	1.60	U	2.00	ug/L							
Methane	0.490	U	1.00	ug/L							

LCS (1D15009-BS1) Prepared: 04/15/2011 09:27 Analyzed: 04/18/2011 10:55

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

QUALITY CONTROL

Dissolved Gases by GC - Quality Control

Batch 1D15009 - NO PREP ANALYTIX

LCS (1D15009-BS1) Continued Prepared: 04/15/2011 09:27 Analyzed: 04/18/2011 10:55

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Carbon dioxide	27100		2500	ug/L	26200		104	71-119			
Ethane	191		2.00	ug/L	180		106	75-123			
Ethene	180		2.00	ug/L	167		108	72-131			
Methane	103		1.00	ug/L	96.9		106	74-116			

Matrix Spike (1D15009-MS1) Prepared: 04/15/2011 09:27 Analyzed: 04/18/2011 11:24

Source: C104061-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Carbon dioxide	59700		2500	ug/L	26200	42600	65	71-119			QM-02
Ethane	207		2.00	ug/L	180	1.50 U	115	75-123			
Ethene	182		2.00	ug/L	167	1.60 U	109	72-131			
Methane	110		1.00	ug/L	96.9	0.490 U	114	74-116			

Matrix Spike Dup (1D15009-MSD1) Prepared: 04/15/2011 09:27 Analyzed: 04/18/2011 11:27

Source: C104061-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Carbon dioxide	62400		2500	ug/L	26200	42600	76	71-119	4	10	
Ethane	207		2.00	ug/L	180	1.50 U	115	75-123	0.2	14	
Ethene	185		2.00	ug/L	167	1.60 U	110	72-131	1	12	
Methane	110		1.00	ug/L	96.9	0.490 U	113	74-116	0.8	18	

Batch 1D18018 - NO PREP ANALYTIX

Blank (1D18018-BLK1) Prepared: 04/18/2011 16:19 Analyzed: 04/18/2011 16:49

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Carbon dioxide	2000	U	2500	ug/L							
Ethane	1.50	U	2.00	ug/L							
Ethene	1.60	U	2.00	ug/L							
Methane	0.490	U	1.00	ug/L							

LCS (1D18018-BS1) Prepared: 04/18/2011 16:19 Analyzed: 04/18/2011 16:53

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Carbon dioxide	23400		2500	ug/L	26200		89	71-119			
Ethane	176		2.00	ug/L	180		98	75-123			
Ethene	163		2.00	ug/L	167		98	72-131			
Methane	91.4		1.00	ug/L	96.9		94	74-116			

Matrix Spike (1D18018-MS1) Prepared: 04/18/2011 16:19 Analyzed: 04/18/2011 16:57

Source: C104671-02

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Carbon dioxide	85100		2500	ug/L	26200	65000	77	71-119			
Ethane	196		2.00	ug/L	180	1.50 U	109	75-123			

QUALITY CONTROL

Dissolved Gases by GC - Quality Control

Batch 1D18018 - NO PREP ANALYTIX

Matrix Spike (1D18018-MS1) Continued Prepared: 04/18/2011 16:19 Analyzed: 04/18/2011 16:57

Source: C104671-02

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Ethene	179		2.00	ug/L	167	1.60 U	107	72-131			
Methane	102		1.00	ug/L	96.9	0.490 U	105	74-116			

Matrix Spike Dup (1D18018-MSD1) Prepared: 04/18/2011 16:19 Analyzed: 04/18/2011 17:01

Source: C104671-02

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Carbon dioxide	87500		2500	ug/L	26200	65000	86	71-119	3	10	
Ethane	189		2.00	ug/L	180	1.50 U	105	75-123	4	14	
Ethene	176		2.00	ug/L	167	1.60 U	105	72-131	2	12	
Methane	98.4		1.00	ug/L	96.9	0.490 U	101	74-116	4	18	

Volatile Fatty Acids by HPLC - Quality Control

Batch 1D13016 - NO PREP ANALYTIX

Blank (1D13016-BLK1) Prepared: 04/13/2011 13:17 Analyzed: 04/13/2011 14:24

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Acetic Acid	83	U	500	ug/L							
Butyric Acid	160	U	500	ug/L							
Hexanoic Acid	230	U	1000	ug/L							
HIBA (2-Hydroxyisobutyric Acid)	160	U	500	ug/L							
iso-Hexanoic Acid	210	U	1000	ug/L							
iso-Pentanoic Acid	260	U	500	ug/L							
Lactic Acid	440	U	500	ug/L							
Pentanoic Acid	270	U	500	ug/L							
Propionic Acid	180	U	500	ug/L							
Pyruvic Acid	140	U	500	ug/L							
Surrogate: Trimethylacetic acid	*54000*			*ug/L*	*49800*		*109*	*80-124*			

LCS (1D13016-BS1) Prepared: 04/13/2011 13:17 Analyzed: 04/13/2011 15:12

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Acetic Acid	22000		500	ug/L	20000		108	73-125			
Butyric Acid	22000		500	ug/L	19800		111	80-120			
Hexanoic Acid	23000		1000	ug/L	20000		117	78-120			
HIBA (2-Hydroxyisobutyric Acid)	23000		500	ug/L	19900		116	80-120			
iso-Hexanoic Acid	23000		1000	ug/L	19800		117	80-120			
iso-Pentanoic Acid	23000		500	ug/L	19800		116	78-120			
Lactic Acid	17000		500	ug/L	20100		87	56-154			
Pentanoic Acid	23000		500	ug/L	19900		116	77-120			
Propionic Acid	22000		500	ug/L	19800		109	80-120			
Pyruvic Acid	21000		500	ug/L	19700		105	37-142			
Surrogate: Trimethylacetic acid	*50000*			*ug/L*	*49800*		*101*	*80-124*			

QUALITY CONTROL

Volatile Fatty Acids by HPLC - Quality Control

Batch 1D13016 - NO PREP ANALYTIX

Matrix Spike (1D13016-MS1) Prepared: 04/13/2011 13:17 Analyzed: 04/13/2011 16:14

Source: C104061-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Acetic Acid	22000		500	ug/L	20000	83 U	108	73-125			
Butyric Acid	23000		500	ug/L	19800	160 U	116	80-120			
Hexanoic Acid	23000		1000	ug/L	20000	230 U	116	78-120			
HIBA (2-Hydroxyisobutyric Acid)	23000		500	ug/L	19900	160 U	113	80-120			
iso-Hexanoic Acid	23000		1000	ug/L	19800	210 U	117	80-120			
iso-Pentanoic Acid	23000		500	ug/L	19800	260 U	115	78-120			
Lactic Acid	18000		500	ug/L	20100	440 U	89	56-154			
Pentanoic Acid	21000		500	ug/L	19900	270 U	108	77-120			
Propionic Acid	22000		500	ug/L	19800	180 U	112	80-120			
Pyruvic Acid	21000		500	ug/L	19700	140 U	105	37-142			
Surrogate: Trimethylacetic acid	*52000*			*ug/L*	*49800*		*104*	*80-124*			

Matrix Spike Dup (1D13016-MSD1) Prepared: 04/13/2011 13:17 Analyzed: 04/13/2011 17:17

Source: C104061-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Acetic Acid	22000		500	ug/L	20000	83 U	109	73-125	1	10	
Butyric Acid	23000		500	ug/L	19800	160 U	114	80-120	2	10	
Hexanoic Acid	23000		1000	ug/L	20000	230 U	115	78-120	0.7	34	
HIBA (2-Hydroxyisobutyric Acid)	23000		500	ug/L	19900	160 U	115	80-120	2	15	
iso-Hexanoic Acid	23000		1000	ug/L	19800	210 U	117	80-120	0.6	15	
iso-Pentanoic Acid	23000		500	ug/L	19800	260 U	116	78-120	1	15	
Lactic Acid	18000		500	ug/L	20100	440 U	90	56-154	0.06	19	
Pentanoic Acid	23000		500	ug/L	19900	270 U	114	77-120	5	10	
Propionic Acid	22000		500	ug/L	19800	180 U	113	80-120	0.8	10	
Pyruvic Acid	21000		500	ug/L	19700	140 U	106	37-142	0.9	10	
Surrogate: Trimethylacetic acid	*50000*			*ug/L*	*49800*		*101*	*80-124*			

Batch 1D15018 - NO PREP ANALYTIX

Blank (1D15018-BLK1) Prepared: 04/15/2011 13:39 Analyzed: 04/18/2011 10:18

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Acetic Acid	83	U	500	ug/L							
Butyric Acid	160	U	500	ug/L							
Hexanoic Acid	230	U	1000	ug/L							
HIBA (2-Hydroxyisobutyric Acid)	160	U	500	ug/L							
iso-Hexanoic Acid	210	U	1000	ug/L							
iso-Pentanoic Acid	260	U	500	ug/L							
Lactic Acid	440	U	500	ug/L							
Pentanoic Acid	270	U	500	ug/L							
Propionic Acid	180	U	500	ug/L							
Pyruvic Acid	140	U	500	ug/L							
Surrogate: Trimethylacetic acid	*56000*			*ug/L*	*49800*		*113*	*80-124*			

LCS (1D15018-BS1) Prepared: 04/15/2011 13:39 Analyzed: 04/18/2011 11:06

QUALITY CONTROL

Volatile Fatty Acids by HPLC - Quality Control

Batch 1D15018 - NO PREP ANALYTIX

LCS (1D15018-BS1) Continued Prepared: 04/15/2011 13:39 Analyzed: 04/18/2011 11:06

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Acetic Acid	21000		500	ug/L	20000		107	73-125			
Butyric Acid	23000		500	ug/L	19800		118	80-120			
Hexanoic Acid	23000		1000	ug/L	20000		116	78-120			
HIBA (2-Hydroxyisobutyric Acid)	22000		500	ug/L	19900		112	80-120			
iso-Hexanoic Acid	23000		1000	ug/L	19800		118	80-120			
iso-Pentanoic Acid	23000		500	ug/L	19800		117	78-120			
Lactic Acid	19000		500	ug/L	20100		95	56-154			
Pentanoic Acid	23000		500	ug/L	19900		114	77-120			
Propionic Acid	22000		500	ug/L	19800		109	80-120			
Pyruvic Acid	21000		500	ug/L	19700		109	37-142			
Surrogate: Trimethylacetic acid	*50000*			*ug/L*	*49800*		*101*	*80-124*			

Matrix Spike (1D15018-MS1) Prepared: 04/15/2011 13:39 Analyzed: 04/18/2011 12:08

Source: C104671-02

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Acetic Acid	21000		500	ug/L	20000	83 U	105	73-125			
Butyric Acid	21000		500	ug/L	19800	160 U	107	80-120			
Hexanoic Acid	22000		1000	ug/L	20000	230 U	112	78-120			
HIBA (2-Hydroxyisobutyric Acid)	23000		500	ug/L	19900	160 U	114	80-120			
iso-Hexanoic Acid	23000		1000	ug/L	19800	210 U	115	80-120			
iso-Pentanoic Acid	23000		500	ug/L	19800	260 U	118	78-120			
Lactic Acid	19000		500	ug/L	20100	440 U	94	56-154			
Pentanoic Acid	23000		500	ug/L	19900	270 U	114	77-120			
Propionic Acid	22000		500	ug/L	19800	180 U	112	80-120			
Pyruvic Acid	22000		500	ug/L	19700	140 U	111	37-142			
Surrogate: Trimethylacetic acid	*52000*			*ug/L*	*49800*		*104*	*80-124*			

Matrix Spike Dup (1D15018-MSD1) Prepared: 04/15/2011 13:39 Analyzed: 04/18/2011 13:11

Source: C104671-02

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Acetic Acid	22000		500	ug/L	20000	83 U	112	73-125	7	10	
Butyric Acid	22000		500	ug/L	19800	160 U	109	80-120	2	10	
Hexanoic Acid	22000		1000	ug/L	20000	230 U	112	78-120	0.5	34	
HIBA (2-Hydroxyisobutyric Acid)	23000		500	ug/L	19900	160 U	117	80-120	3	15	
iso-Hexanoic Acid	23000		1000	ug/L	19800	210 U	114	80-120	0.8	15	
iso-Pentanoic Acid	23000		500	ug/L	19800	260 U	118	78-120	0.3	15	
Lactic Acid	19000		500	ug/L	20100	440 U	97	56-154	3	19	
Pentanoic Acid	23000		500	ug/L	19900	270 U	118	77-120	4	10	
Propionic Acid	23000		500	ug/L	19800	180 U	114	80-120	2	10	
Pyruvic Acid	22000		500	ug/L	19700	140 U	113	37-142	2	10	
Surrogate: Trimethylacetic acid	*49000*			*ug/L*	*49800*		*99*	*80-124*			

QUALITY CONTROL

Classical Chemistry Parameters - Quality Control

QUALITY CONTROL

Classical Chemistry Parameters - Quality Control

Batch 1D22004 - NO PREP

Blank (1D22004-BLK1) Prepared: 04/22/2011 13:45 Analyzed: 04/22/2011 14:24

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Total Organic Carbon	270	U	1000	ug/L							

LCS (1D22004-BS1) Prepared: 04/22/2011 13:45 Analyzed: 04/22/2011 14:24

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Total Organic Carbon	41000		1000	ug/L	40000		103	85-115			

Matrix Spike (1D22004-MS1) Prepared: 04/22/2011 13:45 Analyzed: 04/22/2011 14:24

Source: A101472-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Total Organic Carbon	44000		1000	ug/L	40000	1000	107	85-115			

Matrix Spike Dup (1D22004-MSD1) Prepared: 04/22/2011 13:45 Analyzed: 04/22/2011 14:24

Source: A101472-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Total Organic Carbon	40000		1000	ug/L	40000	1000	98	85-115	8	21	

Batch 1D25018 - NO PREP

Blank (1D25018-BLK1) Prepared: 04/25/2011 11:42 Analyzed: 04/25/2011 14:03

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Total Organic Carbon	270	U	1000	ug/L							

LCS (1D25018-BS1) Prepared: 04/25/2011 11:42 Analyzed: 04/25/2011 14:03

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Total Organic Carbon	40000		1000	ug/L	40000		100	85-115			

Matrix Spike (1D25018-MS1) Prepared: 04/25/2011 11:42 Analyzed: 04/25/2011 14:03

Source: A102036-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Total Organic Carbon	47000		1000	ug/L	40000	1700	113	85-115			

Matrix Spike Dup (1D25018-MSD1) Prepared: 04/25/2011 11:42 Analyzed: 04/25/2011 14:03

Source: A102036-01

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Total Organic Carbon	43000		1000	ug/L	40000	1700	103	85-115	9	21	

Batch 1D26009 - NO PREP

Blank (1D26009-BLK1) Prepared: 04/26/2011 08:40 Analyzed: 04/27/2011 13:09

QUALITY CONTROL

Classical Chemistry Parameters - Quality Control

Batch 1D26009 - NO PREP

Blank (1D26009-BLK1) Continued Prepared: 04/26/2011 08:40 Analyzed: 04/27/2011 13:09

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Total Organic Carbon	270	U	1000	ug/L							

LCS (1D26009-BS1) Prepared: 04/26/2011 08:40 Analyzed: 04/27/2011 13:09

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Total Organic Carbon	38000		1000	ug/L	40000		94	85-115			

Matrix Spike (1D26009-MS1) Prepared: 04/26/2011 08:40 Analyzed: 04/27/2011 13:09

Source: C104671-02

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Total Organic Carbon	41000		1000	ug/L	40000	1000	100	85-115			

Matrix Spike Dup (1D26009-MSD1) Prepared: 04/26/2011 08:40 Analyzed: 04/27/2011 13:09

Source: C104671-02

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Total Organic Carbon	41000		1000	ug/L	40000	1000	100	85-115	0.6	21	

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.
J-01	Result is estimated due to positive results in the associated method blank.
QB-01	The method blank had a positive result for the analyte; however, the concentration in the method blank is less than 10% of the sample result, which minimizes the impact of the deviation.
QM-02	The RPD and/or percent recovery for this QC spike sample cannot be accurately calculated due to the high concentration of analyte inherent in the sample.
QM-05	The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data is acceptable.
QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
QM-08	Post-digestion spike did not meet method requirements due to confirmed matrix effects (dilution test).

ENVIRONMENTAL CONSERVATION LABORATORIES CHAIN-OF-CUSTODY RECORD

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102-A Woodwinds Industrial Ct. Cary, NC 27511 (919) 467-3090 Fax (919) 467-3515

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Client Name: Golder Associates, Inc. (GO007)	Project Number: 073-9612711.500
Address: 5B Oak Branch Drive	Project Name/Desc: Randolph County LF
City/ST/Zip: Greensboro, NC 27407	PO # / Billing Info
Tel: (336) 852-4903 Fax: (336) 852-4904	Reporting Contact: Dusty Reedy
Sampler(s) Name, Affiliation (Print): N. Rathjen	Billing Contact: Accounts Payable
Sampler(s) Signature: Nate Rath	Site Location / Time Zone: Randolph Co./ Eastern

Requested Turnaround Times

Note : Rush requests subject to acceptance by the facility

✓ Standard

___ Expedited

Due ___/___/___

Lab Workorder: C104061

Item #	Sample ID (Field Identification)	Collection Date	Collection Time	Comp / Grab	Matrix (see codes)	Total # of Containers	8260B Appendix 2	Alkalinity 310.2,Chloride 300,Nitrite as N 353.2	Ca,K,Mg,Na	Fatty Acids	Nitrate Calc 353.2	NOX 353.2	RSK 175 + CO2	Sulfate 300	Sulfide SM4500-S D	TOC SM5310B	Sample Comments
	~~7601-MW1~~	—	—	—	GW	12		X	X	X	X	X	X	X	X	X	
	~~7601-MW2~~	—	—	—	GW	15	X	X	X	X	X	X	X	X	X	X	
	7601-MW5	4/11/11	1032	G	GW	12		X	X	X	X	X	X	X	X	X	
	~~7601-MW6 (MS/MSD)~~	—	—	—	GW	23		X	X	X	X	X	X	X	X	X	
	~~7601-MW7~~	—	—	—	GW	12		X	X	X	X	X	X	X	X	X	
	~~7601-MW8~~	—	—	—	GW	12		X	X	X	X	X	X	X	X	X	
	~~7601-MW9~~	—	—	—	GW	12		X	X	X	X	X	X	X	X	X	
	7601-MW10S	4/11/11	1517	G	GW	15	X	X	X	X	X	X	X	X	X	X	
	7601-MW10D	4/11/11	1612	G	GW	15	X	X	X	X	X	X	X	X	X	X	
	7601-MW11S	4/11/11	1405	G	GW	15	X	X	X	X	X	X	X	X	X	X	
	7601-MW11D	4/11/11	1253	G	GW	15	X	X	X	X	X	X	X	X	X	X	

Preservation (See Codes) (Combine as necessary)

<-- Total # of Containers

Sample Kit Prepared By: Briana Gregory	Date/Time: 4/5/11	Relinquished By: Nate Rath	Date/Time: 4/12/11 0800
Received By: Jamie Shelar	Date/Time: 4/12/11 1300		
Comments/Special Reporting Requirements: 1) please provide level 2 data report 2) unit rates per "basic ordering agreement for lab services" dated April 9, 2004 + the 2010 unit price rate 3) estimated price $ 3,965		Relinquished By	Date/Time
Received By	Date/Time		
Relinquished By	Date/Time	Received By	Date/Time
Cooler #'s & Temps on Receipt: C-311 C-34 C-293 2.7C		Condition Upon Receipt: ✓ Acceptable ___ Unacceptable	

Matrix : GW-Groundwater SO-Soil DW-Drinking Water SE-Sediment SW-Surface Water WW-Wastewater A-Air O-Other (detail in comments) Preservation: I-Ice H-HCl N-HNO3 S-H2SO4 NO-NaOH O-Other (detail in comments)

Remaining samples to follow, with full chain-of-custody.

Note: All samples submitted to ENCO Labs are in accordance with the terms and conditions listed on the reverse of this form, unless prior written agreements exist

ENVIRONMENTAL CONSERVATION LABORATORIES CHAIN-OF-CUSTODY RECORD

10775 Central Port Dr.
Orlando, FL 32824
(407) 826-5314 Fax (407) 850-6945

4810 Executive Park Court, Suite 211
Jacksonville, FL 32216-6069
(904) 296-3007 Fax (904) 296-6210

102-A Woodwinds Industrial Ct.
Cary, NC 27511
(919) 467-3090 Fax (919) 467-3515

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Page 1 of 1

Client Name: Golder Associates, Inc. (GO007)	Project Number: 073-9612711.500
Address: 5B Oak Branch Drive	Project Name/Desc: Randolph County LF
City/ST/Zip: Greensboro, NC 27407	PO # / Billing Info
Tel: (336) 852-4903 Fax: (336) 852-4904	Reporting Contact: Dusty Reedy
Sampler(s) Name, Affiliation (Print): N. Rathjen	Billing Contact: Accounts Payable
Sampler(s) Signature:	Site Location / Time Zone: Randolph Co / Eastern

Requested Turnaround Times

Note : Rush requests subject to acceptance by the facility

✓ Standard

___ Expedited

Due __/__/__

Lab Workorder 568 C104061

Item #	Sample ID (Field Identification)	Collection Date	Collection Time	Comp / Grab	Matrix (see codes)	Total # of Containers	Preservation (See Codes) (Combine as necessary)										Sample Comments
							8260B Appendix 2	Alkalinity 310.2,Chloride 300,Nitrite as N 353.2	Ca,K,Mg,Na	Fatty Acids	Nitrate Calc 353.2	NOX 353.2	RSK 175 + CO2	Sulfate 300	Sulfide SM4500-S D	TOC SM5310B	
	7601-MW1	4/12/11	1611	G	GW	12		X	X	X	X	X	X	X	X	X	
	~~7601-MW2~~	—	—	—	GW	15	X	X	X	X	X	X	X	X	X	X	
	~~7601-MW5~~	—	—	—	GW	12		X	X	X	X	X	X	X	X	X	
	~~7601-MW6 (MS/MSD)~~	—	—	—	GW	23		X	X	X	X	X	X	X	X	X	
	7601-MW7	4/12/11	1358	G	GW	12		X	X	X	X	X	X	X	X	X	
	7601-MW8	4/12/11	1217	G	GW	12		X	X	X	X	X	X	X	X	X	
	7601-MW9	4/12/11	1033	G	GW	12		X	X	X	X	X	X	X	X	X	
	~~7601-MW10S~~	—	~~1303~~	—	GW	15	X	X	X	X	X	X	X	X	X	X	
	~~7601-MW10D~~	—	—	—	GW	15	X	X	X	X	X	X	X	X	X	X	
	~~7601-MW11S~~	—	—	—	GW	15	X	X	X	X	X	X	X	X	X	X	
	~~7601-MW11D~~	—	—	—	GW	15	X	X	X	X	X	X	X	X	X	X	

<-- Total # of Containers

Sample Kit Prepared By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Briana Gregory	4/5/11		4/13/11 0800		4/13/11 1315
Relinquished By		Date/Time	Received By	Date/Time	
Relinquished By		Date/Time	Received By	Date/Time	

Comments/Special Reporting Requirements
① Please provide a level 2 data report
② unit rates - see other chain
③ estimated fees $3965
④ final COC will follow

Cooler #'s & Temps on Receipt: C-311 2.6°C C-34 2.1°C ~~C-293~~

Condition Upon Receipt: ✓ Acceptable ___ Unacceptable

Matrix : GW-Groundwater SO-Soil DW-Drinking Water SE-Sediment SW-Surface Water WW-Wastewater A-Air O-Other (detail in comments)

Preservation: I-Ice H-HCl N-HNO3 S-H2SO4 ~~NO~~ ~~NaOH~~ O-Other (detail in comments)

Note : All samples submitted to ENCO Labs are in accordance with the terms and conditions listed on the reverse of this form, unless prior written agreements exist

Authorized by

Accepted by

ENVIRONMENTAL CONSERVATION LABORATORIES
10775 Central Port Dr. Orlando, FL 32824 (407) 826-5314 Fax (407) 850-6945
4810 Executive Park Court, Suite 211 Jacksonville, FL 32216-6069 (904) 296-3007 Fax (904) 296-6210
102-A Woodwinds Industrial Ct. Cary, NC 27511 (919) 467-3090 Fax (919) 467-3515
www.encolabs.com

CHAIN-OF-CUSTODY RECORD

Client Name: Golder Associates, Inc. (GO007)	Project Number: 073-9612711.500
Address: 5B Oak Branch Drive	Project Name/Desc: Randolph County LF
City/ST/Zip: Greensboro, NC 27407	PO # / Billing Info
Tel: (336) 852-4903 Fax: (336) 852-4904	Reporting Contact: Dusty Reedy
Sampler(s) Name, Affiliation (Print): N. Kathjen	Billing Contact: Accounts Payable
Sampler(s) Signature: Natte Kath	Site Location / Time Zone: Randolph Co / Eastern

Requested Turnaround Times

Note : Rush requests subject to acceptance by the facility

√ Standard

___ Expedited

Due ___/___/___

Lab Workorder: ~~C104061~~ C1041671

Item #	Sample ID (Field Identification)	Collection Date	Collection Time	Comp / Grab	Matrix (see codes)	Total # of Containers	8260B Appendix 2	Alkalinity 310.2,Chloride 300,Nitrite as N 353.2	Ca,K,Mg,Na	Fatty Acids	Nitrate Calc 353.2	NOX 353.2	RSK 175 + CO2	Sulfate 300	Sulfide SM4500-S D	TOC SM5310B
	~~7601-MW1~~	~~4/12/11~~	~~1611~~	G	~~GW~~	12		X	X	X	X	X	X	X	X	X
√	7601-MW2	4/13/11	1312	G	GW	15	X	X	X	X	X	X	X	X	X	X
	~~7601-MW5~~	~~4/12/11~~	~~1032~~	G	~~GW~~	12		X	X	X	X	X	X	X	X	X
√	7601-MW6 (MS/MSD)	4/13/11	0953	G	GW	23		X	X	X	X	X	X	X	X	X
	~~7601-MW7~~	~~4/12/11~~	~~1358~~	G	~~GW~~	12		X	X	X	X	X	X	X	X	X
	~~7601-MW8~~	~~4/12/11~~	~~1217~~	G	~~GW~~	12		X	X	X	X	X	X	X	X	X
	~~7601-MW9~~	~~4/12/11~~	~~1033~~	G	~~GW~~	12		X	X	X	X	X	X	X	X	X
	~~7601-MW10S~~	~~4/11/11~~	~~1517~~	G	~~GW~~	15	X	X	X	X	X	X	X	X	X	X
	~~7601-MW10D~~	~~4/11/11~~	~~1612~~	G	~~GW~~	15	X	X	X	X	X	X	X	X	X	X
	~~7601-MW11S~~	~~4/11/11~~	~~1405~~	G	~~GW~~	15	X	X	X	X	X	X	X	X	X	X
	~~7601-MW11D~~	~~4/11/11~~	~~1253~~	G	~~GW~~	15	X	X	X	X	X	X	X	X	X	X

Requested Analyses

Preservation (See Codes) (Combine as necessary)

Sample Comments

Already received MW1, MW5, MW7, MW8, MW9, MW10S, MW10D, MW11S, and MW11D. BJG 4/14/11

<-- Total # of Containers

Sample Kit Prepared By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time
Briana Gregory	4/5/11	Natte Kath	4/14/11 0800	Briana Gregory	4/14/11 11:00
		Relinquished By	Date/Time	Received By	Date/Time
		Relinquished By	Date/Time	Received By	Date/Time

Comments/Special Reporting Requirements:
① Please provide level 2 data report
② Unit rates per "Basic ordering agreement for lab services, dated April 9, 2004 + the 2010 unit price sheet
③ estimated fees → $3965

Cooler #'s & Temps on Receipt: C-311 1.7°C C-34 C-293

Condition Upon Receipt: X Acceptable ___ Unacceptable

Matrix : GW-Groundwater SO-Soil DW-Drinking Water SE-Sediment SW-Surface Water WW-Wastewater A-Air O-Other (detail in comments)

Preservation: I-Ice H-HCl N-HNO3 S-H2SO4 NO-NaOH O-Other (detail in comments)

Note : All samples submitted to ENCO Labs are in accordance with the terms and conditions listed on the reverse of this form, unless prior written agreements exist

Authorized by Natte Kath

Accepted by

www.encolabs.com

C104061

ENCO Cary

Sample Receipt Conditions

Client:	**Golder Associates, Inc. (GO007)**	**Lab Project Mgr:**	**Stephanie Franz**
Project:	**Randolph County LF**	**Project Number:**	**073-9612711.500**
PO #:			

Report To:

Golder Associates, Inc. (GO007)
Dusty Reedy
5B Oak Branch Drive
Greensboro, NC 27407
Phone: (336) 852-4903
Fax: (336) 852-4904

Invoice To:

Golder Associates, Inc. (GO007)
Accounts Payable
5B Oak Branch Drive
Greensboro, NC 27407
Phone :(804) 358-7900
Fax: 804-358-2900

Received By:	James G. Thadani	Date Received:	12-Apr-11 13:00
Logged In By:	James G. Thadani	Date Logged In:	12-Apr-11 14:49

Work Order Comments:

C-293 received at 2.7°C

Containers Intact	**Y**	Containers Properly Preserved	**Y**	Proper Containers Received	**Y**	All Samples in PreLog Received	**N**	COC/Labels Agree	**Y**
Custody Seals Intact	**Y**	Volatile Containers Preserved	**Y**	Volatile Containers Headspace Free	**Y**	Aqueous Samples Checked for Residual Cl	**N**	Received On Ice	**Y**

Reviewed By

Date

Client Name: Golder Associates
Contact: Rachel Kirkman
Address: 5B Oak Branch Drive
Greensboro, NC 27407

Lab Proj #: P1104182
Report Date: 04/27/11
Client Proj Name: Randolph Co.
Client Proj #: Randolph Co.

Laboratory Results

Total pages in data package: 14

Lab Sample #	Client Sample ID
P1104182-01	MW-5
P1104182-02	MW-1
P1104182-03	MW-2
P1104182-04	MW-6
P1104182-05	MW-7
P1104182-06	MW-8
P1104182-07	MW-9
P1104182-08	MW-10S
P1104182-09	MW-10D
P1104182-10	MW-11S
P1104182-11	MW-11D

Microseeps test results meet all the requirements of the NELAC standards or provide reasons and/or justification if they do not.

Approved By: Heather Hauser (KL) ***Date:*** 5/2/11

Project Manager: Heather Hauser

The analytical results reported here are reliable and usable to the precision expressed in this report. As required by some regulating authorities, a full discussion of the uncertainty in our analytical results can be obtained at our web site or through customer service. Unless otherwise specified, all results are reported on a wet weight basis.

As a valued client we would appreciate your comments on our service.
Please call customer service at (412)826-5245 or email customerservice@microseeps.com.

Case Narrative:

Client Name: Golder Associates
Contact: Rachel Kirkman
Address: 5B Oak Branch Drive
Greensboro, NC 27407

Lab Proj #: P1104182
Report Date: 04/27/11
Client Proj Name: Randolph Co.
Client Proj #: Randolph Co.

Sample Description	Matrix	Lab Sample #	Sampled Date/Time	Received
MW-5	Vapor	P1104182-01	11 Apr. 11 12:11	18 Apr. 11 11:08

Analyte(s)	Flag	Result	PQL	Units	Method #	Analysis Date	By
RiskAnalysis							
N Hydrogen		2.700	0.600	nM	AM20GAX	4/20/11	gt

PA02-00538

Data Qualifiers: J - estimated value, U - Non detect, R - Poor surrogate recovery, M - Recovery/RPD poor for MS/MSD, SAMP/DUP, B - detected in blank, S - field sample as received did not meet NELAC sample acceptance criteria, L - Subcontracted Lab used, N - NELAC certified analysis

Client Name: Golder Associates
Contact: Rachel Kirkman
Address: 5B Oak Branch Drive
Greensboro, NC 27407

Lab Proj #: P1104182
Report Date: 04/27/11
Client Proj Name: Randolph Co.
Client Proj #: Randolph Co.

Sample Description	Matrix	Lab Sample #	Sampled Date/Time	Received
MW-1	Vapor	P1104182-02	12 Apr. 11 17:03	18 Apr. 11 11:08

Analyte(s)	Flag	Result	PQL	Units	Method #	Analysis Date	By
RiskAnalysis							
N Hydrogen		1.100	0.600	nM	AM20GAX	4/20/11	gt

PA02-00538

Data Qualifiers: J - estimated value, U - Non detect, R - Poor surrogate recovery, M - Recovery/RPD poor for MS/MSD, SAMP/DUP, B - detected in blank, S - field sample as received did not meet NELAC sample acceptance criteria, L - Subcontracted Lab used, N - NELAC certified analysis

Client Name: Golder Associates
Contact: Rachel Kirkman
Address: 5B Oak Branch Drive
Greensboro, NC 27407

Lab Proj #: P1104182
Report Date: 04/27/11
Client Proj Name: Randolph Co.
Client Proj #: Randolph Co.

Sample Description	Matrix	Lab Sample #	Sampled Date/Time	Received
MW-2	Vapor	P1104182-03	13 Apr. 11 14:09	18 Apr. 11 11:08

Analyte(s)	Flag	Result	PQL	Units	Method #	Analysis Date	By
RiskAnalysis							
N Hydrogen		0.750	0.600	nM	AM20GAX	4/20/11	gt

Data Qualifiers: J - estimated value, U - Non detect, R - Poor surrogate recovery, M - Recovery/RPD poor for MS/MSD, SAMP/DUP, B - detected in blank, S - field sample as received did not meet NELAC sample acceptance criteria, L - Subcontracted Lab used, N - NELAC certified analysis

PA02-00538

Client Name: Golder Associates
Contact: Rachel Kirkman
Address: 5B Oak Branch Drive
Greensboro, NC 27407

Lab Proj #: P1104182
Report Date: 04/27/11
Client Proj Name: Randolph Co.
Client Proj #: Randolph Co.

Sample Description	Matrix	Lab Sample #	Sampled Date/Time	Received
MW-6	Vapor	P1104182-04	13 Apr. 11 12:29	18 Apr. 11 11:08

Analyte(s)	Flag	Result	PQL	Units	Method #	Analysis Date	By
RiskAnalysis							
N Hydrogen		2.400	0.600	nM	AM20GAX	4/20/11	gt

Data Qualifiers: J - estimated value, U - Non detect, R - Poor surrogate recovery, M - Recovery/RPD poor for MS/MSD, SAMP/DUP, B - detected in blank, S - field sample as received did not meet NELAC sample acceptance criteria, L - Subcontracted Lab used, N - NELAC certified analysis

PA02-00538

Client Name: Golder Associates
Contact: Rachel Kirkman
Address: 5B Oak Branch Drive
Greensboro, NC 27407

Lab Proj #: P1104182
Report Date: 04/27/11
Client Proj Name: Randolph Co.
Client Proj #: Randolph Co.

Sample Description	Matrix	Lab Sample #	Sampled Date/Time	Received
MW-7	Vapor	P1104182-05	12 Apr. 11 15:32	18 Apr. 11 11:08

Analyte(s)	Flag	Result	PQL	Units	Method #	Analysis Date	By
RiskAnalysis							
N Hydrogen		0.930	0.600	nM	AM20GAX	4/20/11	gt

PA02-00538

Data Qualifiers: J - estimated value, U - Non detect, R - Poor surrogate recovery, M - Recovery/RPD poor for MS/MSD, SAMP/DUP, B - detected in blank, S - field sample as received did not meet NELAC sample acceptance criteria, L - Subcontracted Lab used, N - NELAC certified analysis

Client Name: Golder Associates
Contact: Rachel Kirkman
Address: 5B Oak Branch Drive
Greensboro, NC 27407

Lab Proj #: P1104182
Report Date: 04/27/11
Client Proj Name: Randolph Co.
Client Proj #: Randolph Co.

Sample Description	Matrix	Lab Sample #	Sampled Date/Time	Received
MW-8	Vapor	P1104182-06	12 Apr. 11 13:18	18 Apr. 11 11:08

Analyte(s)	Flag	Result	PQL	Units	Method #	Analysis Date	By
RiskAnalysis							
N Hydrogen		0.740	0.600	nM	AM20GAX	4/20/11	gt

Data Qualifiers: J - estimated value, U - Non detect, R - Poor surrogate recovery, M - Recovery/RPD poor for MS/MSD, SAMP/DUP, B - detected in blank, S - field sample as received did not meet NELAC sample acceptance criteria, L - Subcontracted Lab used, N - NELAC certified analysis

PA02-00538

Client Name: Golder Associates
Contact: Rachel Kirkman
Address: 5B Oak Branch Drive
Greensboro, NC 27407

Lab Proj #: P1104182
Report Date: 04/27/11
Client Proj Name: Randolph Co.
Client Proj #: Randolph Co.

Sample Description	Matrix	Lab Sample #	Sampled Date/Time	Received
MW-9	Vapor	P1104182-07	12 Apr. 11 11:31	18 Apr. 11 11:08

Analyte(s)	Flag	Result	PQL	Units	Method #	Analysis Date	By
RiskAnalysis							
N Hydrogen		1.800	0.600	nM	AM20GAX	4/20/11	gt

PA02-00538

Data Qualifiers: J - estimated value, U - Non detect, R - Poor surrogate recovery, M - Recovery/RPD poor for MS/MSD, SAMP/DUP, B - detected in blank, S - field sample as received did not meet NELAC sample acceptance criteria, L - Subcontracted Lab used, N - NELAC certified analysis

Client Name: Golder Associates
Contact: Rachel Kirkman
Address: 5B Oak Branch Drive
Greensboro, NC 27407

Lab Proj #: P1104182
Report Date: 04/27/11
Client Proj Name: Randolph Co.
Client Proj #: Randolph Co.

Sample Description	Matrix	Lab Sample #	Sampled Date/Time	Received
MW-10S	Vapor	P1104182-08	11 Apr. 11 15:52	18 Apr. 11 11:08

Analyte(s)	Flag	Result	PQL	Units	Method #	Analysis Date	By
RiskAnalysis							
N Hydrogen		2.000	0.600	nM	AM20GAX	4/20/11	gt

Client Name: Golder Associates
Contact: Rachel Kirkman
Address: 5B Oak Branch Drive
Greensboro, NC 27407

Lab Proj #: P1104182
Report Date: 04/27/11
Client Proj Name: Randolph Co.
Client Proj #: Randolph Co.

Sample Description	Matrix	Lab Sample #	Sampled Date/Time	Received
MW-10D	Vapor	P1104182-09	11 Apr. 11 16:50	18 Apr. 11 11:08

Analyte(s)	Flag	Result	PQL	Units	Method #	Analysis Date	By
RiskAnalysis							
N Hydrogen		1.800	0.600	nM	AM20GAX	4/20/11	gt

Data Qualifiers: J - estimated value, U - Non detect, R - Poor surrogate recovery, M - Recovery/RPD poor for MS/MSD, SAMP/DUP, B - detected in blank, S - field sample as received did not meet NELAC sample acceptance criteria, L - Subcontracted Lab used, N - NELAC certified analysis

PA02-00538

Client Name: Golder Associates
Contact: Rachel Kirkman
Address: 5B Oak Branch Drive
Greensboro, NC 27407

Lab Proj #: P1104182
Report Date: 04/27/11
Client Proj Name: Randolph Co.
Client Proj #: Randolph Co.

Sample Description	Matrix	Lab Sample #	Sampled Date/Time	Received
MW-11S	Vapor	P1104182-10	11 Apr. 11 14:40	18 Apr. 11 11:08

Analyte(s)	Flag	Result	PQL	Units	Method #	Analysis Date	By
RiskAnalysis							
N Hydrogen		0.900	0.600	nM	AM20GAX	4/20/11	gt

PA02-00538

Data Qualifiers: J - estimated value, U - Non detect, R - Poor surrogate recovery, M - Recovery/RPD poor for MS/MSD, SAMP/DUP, B - detected in blank, S - field sample as received did not meet NELAC sample acceptance criteria, L - Subcontracted Lab used, N - NELAC certified analysis

Client Name: Golder Associates
Contact: Rachel Kirkman
Address: 5B Oak Branch Drive
Greensboro, NC 27407

Lab Proj #: P1104182
Report Date: 04/27/11
Client Proj Name: Randolph Co.
Client Proj #: Randolph Co.

Sample Description	Matrix	Lab Sample #	Sampled Date/Time	Received
MW-11D	Vapor	P1104182-11	11 Apr. 11 13:36	18 Apr. 11 11:08

Analyte(s)	Flag	Result	PQL	Units	Method #	Analysis Date	By
RiskAnalysis							
N Hydrogen		2.100	0.600	nM	AM20GAX	4/20/11	gt

Data Qualifiers: J - estimated value, U - Non detect, R - Poor surrogate recovery, M - Recovery/RPD poor for MS/MSD, SAMP/DUP, B - detected in blank, S - field sample as received did not meet NELAC sample acceptance criteria, L - Subcontracted Lab used, N - NELAC certified analysis

PA02-00538

Client Name: Golder Associates
Contact: Rachel Kirkman
Address: 5B Oak Branch Drive
Greensboro, NC 27407

Lab Proj #: P1104182
Report Date: 04/27/11
Client Proj Name: Randolph Co.
Client Proj #: Randolph Co.

Prep Method: Hydrogen by Bubble Strip
Analysis Method: Hydrogen by Bubble Strip

M110421003-MB

	Result		TrueSpikeConc.	RDL	%Recovery	Ctl Limits
Hydrogen	< 0.600	nM		0.600		- NA

M110421003-LCS

	Result		TrueSpikeConc.	%Recovery	Ctl Limits
Hydrogen	48.000	nM	48.91	98.00	80 - 120

M110421003-LCSD

	Result		TrueSpikeConc.	%Recovery	Ctl Limits	RPD	RPD Ctl Limits
Hydrogen	47.000	nM	48.91	96.00	80 - 120	2.11	0 - 20

Outlined Results indicate results outside of Control limits

PA02-00538

Data Qualifiers: J - estimated value, U - Non detect, R - Poor surrogate recovery, M - Recovery/RPD poor for MS/MSD, SAMP/DUP, B - detected in blank, S - field sample as received did not meet NELAC sample acceptance criteria, L - Subcontracted Lab used, N - NELAC certified analysis

Microseeps Lab. Proj. # P1104182

CHAIN - OF - CUSTODY RECORD

Microseeps COC cont. # 4/1

Phone: (412) 826-5245 | Microseeps, Inc. - 220 William Pitt Way - Pittsburgh, PA 15238 | Fax No. : (412) 826-3433

Company : Golder Associates

Co. Address : 5B Oak Branch Dr Greensboro NC 27407

Phone # : (336) 852-4903 Fax # :

Proj. Manager : Dusty Roady

Proj. Name/Number : Randolph Co.

Sampler's signature :

Cooler Temp.

Results to : Golder

Invoice to : Golder

Sample ID	Sample Description	Sample Type Water	Vapor	Solid	Date	Time	# bottles	Parameters Requested: Hydrogen	Remarks :
MW-5	15 ml		/		4/11/11	1211	1	X	
MW-1			/		4/12/11	1705	1	X	
MW-2			/		4/13/11	1469	1	X	
MW-6			/		4/13/11	1238	1	X	
MW-7			/		4/12/11	1532	1	X	
MW-8			/		4/12/11	1318	1	X	
MW-9			/		4/12/11	1131	1	X	
MW-10S			/		4/11/11	1552	1	X	
MW-10D			/		4/11/11	1650	1	X	
MW-11S			/		4/11/11	1440	1	X	
MW-11D	↓		/		4/11/11	1336	1	X	

Relinquished by :	Company :	Date :	Time :	Received by :	Company :	Date :	Time :
	Golder Associates	4/14/11	1000			4/14/11	1000
Relinquished by :	Company :	Date :	Time :	Received by :	Company :	Date :	Time :
Relinquished by :	Company :	Date :	Time :	Received by :	Company :	Date :	Time :

WHITE COPY : Accompany Samples YELLOW COPY : Laboratory File PINK COPY : Submitter

APPENDIX G

APRIL 2011 HEADSPACE MONITORING CERTIFICATES-OF ANALYSIS, CHAIN-OF-CUSTODY FORMS, AND DATA REVIEWS

Environmental Conservation Laboratories, Inc.
4810 Executive Park Court, Suite 111
Jacksonville FL, 32216-6069
Phone: 904.296.3007 FAX: 904.296.6210
www.encolabs.com

Thursday, April 21, 2011

Golder Associates, Inc. (GO007)

Attn: David Reedy II

5B Oak Branch Drive

Greensboro, NC 27407

RE: Laboratory Results for
Project Number: 073-9612711.500, Project Name/Desc: Randolph County LF
ENCO Workorder: B101631

Dear David Reedy II,

Enclosed is a copy of your laboratory report for test samples received by our laboratory on Thursday, April 14, 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 Jacksonville. 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,

Lindsay J Crawford For Chris Tompkins

Project Manager

Enclosure(s)

The total number of pages in this report, including this page is 10.

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SAMPLE SUMMARY/LABORATORY CHRONICLE

Client ID:	MW-1	Lab ID: B101631-01	Sampled: 04/12/11 15:31	Received: 04/14/11 09:12

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
TO-15	05/12/11	04/20/11 21:13	4/21/2011 10:40

Client ID:	MW-1	Lab ID: B101631-01RE1	Sampled: 04/12/11 15:31	Received: 04/14/11 09:12

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
TO-15	05/12/11	04/20/11 21:13	4/21/2011 13:19

Client ID:	MW-7	Lab ID: B101631-02	Sampled: 04/12/11 13:34	Received: 04/14/11 09:12

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
TO-15	05/12/11	04/20/11 21:13	4/21/2011 12:20

Client ID:	MW-8	Lab ID: B101631-03RE1	Sampled: 04/12/11 12:00	Received: 04/14/11 09:12

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
TO-15	05/12/11	04/20/11 21:13	4/21/2011 12:50

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SAMPLE DETECTION SUMMARY

Client ID: MW-1 **Lab ID: B101631-01**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
1,1-Dichloroethene	16	J	4.4	25	ppbv	TO-15	
1,4-Dichlorobenzene	24	J	3.0	25	ppbv	TO-15	
Benzene	19	J	4.2	25	ppbv	TO-15	
Chloroethane	110		6.8	25	ppbv	TO-15	
cis-1,2-Dichloroethene	99		4.9	25	ppbv	TO-15	
Trichloroethene	44		3.1	25	ppbv	TO-15	
Vinyl chloride	46		6.0	25	ppbv	TO-15	

Client ID: MW-1 **Lab ID: B101631-01RE1**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
1,1-Dichloroethane	590		6.6	40	ppbv	TO-15	

Client ID: MW-7 **Lab ID: B101631-02**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
1,1-Dichloroethane	4.8		0.41	2.5	ppbv	TO-15	
2-Butanone	3.2		0.47	2.5	ppbv	TO-15	
Acetone	39		2.0	2.5	ppbv	TO-15	
Trichlorofluoromethane	11		0.52	2.5	ppbv	TO-15	

Client ID: MW-8 **Lab ID: B101631-03RE1**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
1,1-Dichloroethane	44		2.0	12	ppbv	TO-15	
Carbon disulfide	9.0	J	3.2	12	ppbv	TO-15	
Trichloroethene	21		1.6	12	ppbv	TO-15	
Trichlorofluoromethane	22		2.6	12	ppbv	TO-15	

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ANALYTICAL RESULTS

Description: MW-1 | **Lab Sample ID:** B101631-01 | **Received:** 04/14/11 09:12

Matrix: Air | **Sampled:** 04/12/11 15:31 | **Work Order:** B101631

Project: Randolph County LF | **Sampled By:** N. Rathjen | **% Solids:**

Volatile Organic Compounds by GCMS

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]	5.2	U	ppbv	1	5.2	25	1D20020	TO-15	04/21/11 10:40	JDB	
1,1,2,2-Tetrachloroethane [79-34-5]	4.8	U	ppbv	1	4.8	25	1D20020	TO-15	04/21/11 10:40	JDB	
1,1,2-Trichloroethane [79-00-5]	4.5	U	ppbv	1	4.5	25	1D20020	TO-15	04/21/11 10:40	JDB	
1,1-Dichloroethane [75-34-3]	**590**		ppbv	1	6.6	40	1D20020	TO-15	04/21/11 13:19	JDB	
1,1-Dichloroethene [75-35-4]	**16**	J	ppbv	1	4.4	25	1D20020	TO-15	04/21/11 10:40	JDB	
1,2-Dibromoethane [106-93-4]	4.9	U	ppbv	1	4.9	25	1D20020	TO-15	04/21/11 10:40	JDB	
1,2-Dichlorobenzene [95-50-1]	4.3	U	ppbv	1	4.3	25	1D20020	TO-15	04/21/11 10:40	JDB	
1,2-Dichloroethane [107-06-2]	3.6	U	ppbv	1	3.6	25	1D20020	TO-15	04/21/11 10:40	JDB	
1,2-Dichloropropane [78-87-5]	4.0	U	ppbv	1	4.0	25	1D20020	TO-15	04/21/11 10:40	JDB	
1,4-Dichlorobenzene [106-46-7]	**24**	J	ppbv	1	3.0	25	1D20020	TO-15	04/21/11 10:40	JDB	
2-Butanone [78-93-3]	4.7	U	ppbv	1	4.7	25	1D20020	TO-15	04/21/11 10:40	JDB	
2-Hexanone [591-78-6]	7.3	U	ppbv	1	7.3	25	1D20020	TO-15	04/21/11 10:40	JDB	
4-Methyl-2-pentanone [108-10-1]	4.8	U	ppbv	1	4.8	25	1D20020	TO-15	04/21/11 10:40	JDB	
Acetone [67-64-1]	20	U	ppbv	1	20	25	1D20020	TO-15	04/21/11 10:40	JDB	
Benzene [71-43-2]	**19**	J	ppbv	1	4.2	25	1D20020	TO-15	04/21/11 10:40	JDB	
Bromodichloromethane [75-27-4]	3.2	U	ppbv	1	3.2	25	1D20020	TO-15	04/21/11 10:40	JDB	
Bromoform [75-25-2]	3.4	U	ppbv	1	3.4	25	1D20020	TO-15	04/21/11 10:40	JDB	
Bromomethane [74-83-9]	7.0	U	ppbv	1	7.0	25	1D20020	TO-15	04/21/11 10:40	JDB	
Carbon disulfide [75-15-0]	6.3	U	ppbv	1	6.3	25	1D20020	TO-15	04/21/11 10:40	JDB	
Carbon tetrachloride [56-23-5]	4.6	U	ppbv	1	4.6	25	1D20020	TO-15	04/21/11 10:40	JDB	
Chlorobenzene [108-90-7]	3.8	U	ppbv	1	3.8	25	1D20020	TO-15	04/21/11 10:40	JDB	
Chloroethane [75-00-3]	**110**		ppbv	1	6.8	25	1D20020	TO-15	04/21/11 10:40	JDB	
Chloroform [67-66-3]	4.6	U	ppbv	1	4.6	25	1D20020	TO-15	04/21/11 10:40	JDB	
Chloromethane [74-87-3]	6.1	U	ppbv	1	6.1	25	1D20020	TO-15	04/21/11 10:40	JDB	
cis-1,2-Dichloroethene [156-59-2]	**99**		ppbv	1	4.9	25	1D20020	TO-15	04/21/11 10:40	JDB	
cis-1,3-Dichloropropene [10061-01-5]	4.5	U	ppbv	1	4.5	25	1D20020	TO-15	04/21/11 10:40	JDB	
Dibromochloromethane [124-48-1]	4.9	U	ppbv	1	4.9	25	1D20020	TO-15	04/21/11 10:40	JDB	
Ethylbenzene [100-41-4]	5.6	U	ppbv	1	5.6	25	1D20020	TO-15	04/21/11 10:40	JDB	
Methylene chloride [75-09-2]	24	U	ppbv	1	24	25	1D20020	TO-15	04/21/11 10:40	JDB	
Styrene [100-42-5]	3.1	U	ppbv	1	3.1	25	1D20020	TO-15	04/21/11 10:40	JDB	
Tetrachloroethene [127-18-4]	5.0	U	ppbv	1	5.0	25	1D20020	TO-15	04/21/11 10:40	JDB	
Toluene [108-88-3]	4.1	U	ppbv	1	4.1	25	1D20020	TO-15	04/21/11 10:40	JDB	
trans-1,2-Dichloroethene [156-60-5]	6.0	U	ppbv	1	6.0	25	1D20020	TO-15	04/21/11 10:40	JDB	
trans-1,3-Dichloropropene [10061-02-6]	3.7	U	ppbv	1	3.7	25	1D20020	TO-15	04/21/11 10:40	JDB	
Trichloroethene [79-01-6]	**44**		ppbv	1	3.1	25	1D20020	TO-15	04/21/11 10:40	JDB	
Trichlorofluoromethane [75-69-4]	5.2	U	ppbv	1	5.2	25	1D20020	TO-15	04/21/11 10:40	JDB	
Vinyl acetate [108-05-4]	5.1	U	ppbv	1	5.1	25	1D20020	TO-15	04/21/11 10:40	JDB	
Vinyl chloride [75-01-4]	**46**		ppbv	1	6.0	25	1D20020	TO-15	04/21/11 10:40	JDB	
Xylenes (Total) [1330-20-7]	10	U	ppbv	1	10	25	1D20020	TO-15	04/21/11 10:40	JDB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*34*	*1*	*31.2*	*108 %*	*64-124*	*1D20020*	*TO-15*	*04/21/11 10:40*	*JDB*	
4-Bromofluorobenzene	*32*	*1*	*31.2*	*102 %*	*64-124*	*1D20020*	*TO-15*	*04/21/11 13:19*	*JDB*	

Description: MW-7 | **Lab Sample ID:** B101631-02 | **Received:** 04/14/11 09:12

Matrix: Air | **Sampled:** 04/12/11 13:34 | **Work Order:** B101631

Project: Randolph County LF | **Sampled By:** N. Rathjen | **% Solids:**

Volatile Organic Compounds by GCMS

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]	0.52	U	ppbv	1	0.52	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
1,1,2,2-Tetrachloroethane [79-34-5]	0.48	U	ppbv	1	0.48	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
1,1,2-Trichloroethane [79-00-5]	0.45	U	ppbv	1	0.45	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
1,1-Dichloroethane [75-34-3]	**4.8**		ppbv	1	0.41	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
1,1-Dichloroethene [75-35-4]	0.44	U	ppbv	1	0.44	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
1,2-Dibromoethane [106-93-4]	0.49	U	ppbv	1	0.49	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
1,2-Dichlorobenzene [95-50-1]	0.43	U	ppbv	1	0.43	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
1,2-Dichloroethane [107-06-2]	0.36	U	ppbv	1	0.36	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
1,2-Dichloropropane [78-87-5]	0.40	U	ppbv	1	0.40	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
1,4-Dichlorobenzene [106-46-7]	0.30	U	ppbv	1	0.30	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
2-Butanone [78-93-3]	**3.2**		ppbv	1	0.47	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
2-Hexanone [591-78-6]	0.73	U	ppbv	1	0.73	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
4-Methyl-2-pentanone [108-10-1]	0.48	U	ppbv	1	0.48	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
Acetone [67-64-1]	**39**		ppbv	1	2.0	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
Benzene [71-43-2]	0.42	U	ppbv	1	0.42	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
Bromodichloromethane [75-27-4]	0.32	U	ppbv	1	0.32	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
Bromoform [75-25-2]	0.34	U	ppbv	1	0.34	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
Bromomethane [74-83-9]	0.70	U	ppbv	1	0.70	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
Carbon disulfide [75-15-0]	0.63	U	ppbv	1	0.63	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
Carbon tetrachloride [56-23-5]	0.46	U	ppbv	1	0.46	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
Chlorobenzene [108-90-7]	0.38	U	ppbv	1	0.38	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
Chloroethane [75-00-3]	0.68	U	ppbv	1	0.68	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
Chloroform [67-66-3]	0.46	U	ppbv	1	0.46	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
Chloromethane [74-87-3]	0.61	U	ppbv	1	0.61	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
cis-1,2-Dichloroethene [156-59-2]	0.49	U	ppbv	1	0.49	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
cis-1,3-Dichloropropene [10061-01-5]	0.45	U	ppbv	1	0.45	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
Dibromochloromethane [124-48-1]	0.49	U	ppbv	1	0.49	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
Ethylbenzene [100-41-4]	0.56	U	ppbv	1	0.56	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
Methylene chloride [75-09-2]	2.4	U	ppbv	1	2.4	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
Styrene [100-42-5]	0.31	U	ppbv	1	0.31	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
Tetrachloroethene [127-18-4]	0.50	U	ppbv	1	0.50	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
Toluene [108-88-3]	0.41	U	ppbv	1	0.41	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
trans-1,2-Dichloroethene [156-60-5]	0.60	U	ppbv	1	0.60	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
trans-1,3-Dichloropropene [10061-02-6]	0.37	U	ppbv	1	0.37	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
Trichloroethene [79-01-6]	0.31	U	ppbv	1	0.31	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
Trichlorofluoromethane [75-69-4]	**11**		ppbv	1	0.52	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
Vinyl acetate [108-05-4]	0.51	U	ppbv	1	0.51	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
Vinyl chloride [75-01-4]	0.60	U	ppbv	1	0.60	2.5	1D20020	TO-15	04/21/11 12:20	JDB	
Xylenes (Total) [1330-20-7]	1.0	U	ppbv	1	1.0	2.5	1D20020	TO-15	04/21/11 12:20	JDB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*31*	*1*	*31.2*	*101 %*	*64-124*	*1D20020*	*TO-15*	*04/21/11 12:20*	*JDB*	

Description: MW-8 | **Lab Sample ID:** B101631-03 | **Received:** 04/14/11 09:12

Matrix: Air | **Sampled:** 04/12/11 12:00 | **Work Order:** B101631

Project: Randolph County LF | **Sampled By:** N. Rathjen | **% Solids:**

Volatile Organic Compounds by GCMS

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	MRL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]	2.6	U	ppbv	1	2.6	12	1D20020	TO-15	04/21/11 12:50	JDB	
1,1,2,2-Tetrachloroethane [79-34-5]	2.4	U	ppbv	1	2.4	12	1D20020	TO-15	04/21/11 12:50	JDB	
1,1,2-Trichloroethane [79-00-5]	2.2	U	ppbv	1	2.2	12	1D20020	TO-15	04/21/11 12:50	JDB	
1,1-Dichloroethane [75-34-3]	**44**		ppbv	1	2.0	12	1D20020	TO-15	04/21/11 12:50	JDB	
1,1-Dichloroethene [75-35-4]	2.2	U	ppbv	1	2.2	12	1D20020	TO-15	04/21/11 12:50	JDB	
1,2-Dibromoethane [106-93-4]	2.4	U	ppbv	1	2.4	12	1D20020	TO-15	04/21/11 12:50	JDB	
1,2-Dichlorobenzene [95-50-1]	2.2	U	ppbv	1	2.2	12	1D20020	TO-15	04/21/11 12:50	JDB	
1,2-Dichloroethane [107-06-2]	1.8	U	ppbv	1	1.8	12	1D20020	TO-15	04/21/11 12:50	JDB	
1,2-Dichloropropane [78-87-5]	2.0	U	ppbv	1	2.0	12	1D20020	TO-15	04/21/11 12:50	JDB	
1,4-Dichlorobenzene [106-46-7]	1.5	U	ppbv	1	1.5	12	1D20020	TO-15	04/21/11 12:50	JDB	
2-Butanone [78-93-3]	2.4	U	ppbv	1	2.4	12	1D20020	TO-15	04/21/11 12:50	JDB	
2-Hexanone [591-78-6]	3.6	U	ppbv	1	3.6	12	1D20020	TO-15	04/21/11 12:50	JDB	
4-Methyl-2-pentanone [108-10-1]	2.4	U	ppbv	1	2.4	12	1D20020	TO-15	04/21/11 12:50	JDB	
Acetone [67-64-1]	10	U	ppbv	1	10	12	1D20020	TO-15	04/21/11 12:50	JDB	
Benzene [71-43-2]	2.1	U	ppbv	1	2.1	12	1D20020	TO-15	04/21/11 12:50	JDB	
Bromodichloromethane [75-27-4]	1.6	U	ppbv	1	1.6	12	1D20020	TO-15	04/21/11 12:50	JDB	
Bromoform [75-25-2]	1.7	U	ppbv	1	1.7	12	1D20020	TO-15	04/21/11 12:50	JDB	
Bromomethane [74-83-9]	3.5	U	ppbv	1	3.5	12	1D20020	TO-15	04/21/11 12:50	JDB	
Carbon disulfide [75-15-0]	**9.0**	J	ppbv	1	3.2	12	1D20020	TO-15	04/21/11 12:50	JDB	
Carbon tetrachloride [56-23-5]	2.3	U	ppbv	1	2.3	12	1D20020	TO-15	04/21/11 12:50	JDB	
Chlorobenzene [108-90-7]	1.9	U	ppbv	1	1.9	12	1D20020	TO-15	04/21/11 12:50	JDB	
Chloroethane [75-00-3]	3.4	U	ppbv	1	3.4	12	1D20020	TO-15	04/21/11 12:50	JDB	
Chloroform [67-66-3]	2.3	U	ppbv	1	2.3	12	1D20020	TO-15	04/21/11 12:50	JDB	
Chloromethane [74-87-3]	3.0	U	ppbv	1	3.0	12	1D20020	TO-15	04/21/11 12:50	JDB	
cis-1,2-Dichloroethene [156-59-2]	2.4	U	ppbv	1	2.4	12	1D20020	TO-15	04/21/11 12:50	JDB	
cis-1,3-Dichloropropene [10061-01-5]	2.2	U	ppbv	1	2.2	12	1D20020	TO-15	04/21/11 12:50	JDB	
Dibromochloromethane [124-48-1]	2.4	U	ppbv	1	2.4	12	1D20020	TO-15	04/21/11 12:50	JDB	
Ethylbenzene [100-41-4]	2.8	U	ppbv	1	2.8	12	1D20020	TO-15	04/21/11 12:50	JDB	
Methylene chloride [75-09-2]	12	U	ppbv	1	12	12	1D20020	TO-15	04/21/11 12:50	JDB	
Styrene [100-42-5]	1.6	U	ppbv	1	1.6	12	1D20020	TO-15	04/21/11 12:50	JDB	
Tetrachloroethene [127-18-4]	2.5	U	ppbv	1	2.5	12	1D20020	TO-15	04/21/11 12:50	JDB	
Toluene [108-88-3]	2.0	U	ppbv	1	2.0	12	1D20020	TO-15	04/21/11 12:50	JDB	
trans-1,2-Dichloroethene [156-60-5]	3.0	U	ppbv	1	3.0	12	1D20020	TO-15	04/21/11 12:50	JDB	
trans-1,3-Dichloropropene [10061-02-6]	1.8	U	ppbv	1	1.8	12	1D20020	TO-15	04/21/11 12:50	JDB	
Trichloroethene [79-01-6]	**21**		ppbv	1	1.6	12	1D20020	TO-15	04/21/11 12:50	JDB	
Trichlorofluoromethane [75-69-4]	**22**		ppbv	1	2.6	12	1D20020	TO-15	04/21/11 12:50	JDB	
Vinyl acetate [108-05-4]	2.6	U	ppbv	1	2.6	12	1D20020	TO-15	04/21/11 12:50	JDB	
Vinyl chloride [75-01-4]	3.0	U	ppbv	1	3.0	12	1D20020	TO-15	04/21/11 12:50	JDB	
Xylenes (Total) [1330-20-7]	5.0	U	ppbv	1	5.0	12	1D20020	TO-15	04/21/11 12:50	JDB	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*30*	*1*	*31.2*	*94.9 %*	*64-124*	*1D20020*	*TO-15*	*04/21/11 12:50*	*JDB*	

QUALITY CONTROL

Volatile Organic Compounds by GCMS - Quality Control

Batch 1D20020 - Same

Blank (1D20020-BLK1) Prepared: 04/20/2011 21:13 Analyzed: 04/21/2011 00:27

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	0.52	U	2.5	ppbv							
1,1,2,2-Tetrachloroethane	0.48	U	2.5	ppbv							
1,1,2-Trichloroethane	0.45	U	2.5	ppbv							
1,1-Dichloroethane	0.41	U	2.5	ppbv							
1,1-Dichloroethene	0.44	U	2.5	ppbv							
1,2-Dibromoethane	0.49	U	2.5	ppbv							
1,2-Dichlorobenzene	0.43	U	2.5	ppbv							
1,2-Dichloroethane	0.36	U	2.5	ppbv							
1,2-Dichloropropane	0.40	U	2.5	ppbv							
1,4-Dichlorobenzene	0.30	U	2.5	ppbv							
2-Butanone	0.47	U	2.5	ppbv							
2-Hexanone	0.73	U	2.5	ppbv							
4-Methyl-2-pentanone	0.48	U	2.5	ppbv							
Acetone	2.0	U	2.5	ppbv							
Benzene	0.42	U	2.5	ppbv							
Bromodichloromethane	0.32	U	2.5	ppbv							
Bromoform	0.34	U	2.5	ppbv							
Bromomethane	0.70	U	2.5	ppbv							
Carbon disulfide	0.63	U	2.5	ppbv							
Carbon tetrachloride	0.46	U	2.5	ppbv							
Chlorobenzene	0.38	U	2.5	ppbv							
Chloroethane	0.68	U	2.5	ppbv							
Chloroform	0.46	U	2.5	ppbv							
Chloromethane	0.61	U	2.5	ppbv							
cis-1,2-Dichloroethene	0.49	U	2.5	ppbv							
cis-1,3-Dichloropropene	0.45	U	2.5	ppbv							
Dibromochloromethane	0.49	U	2.5	ppbv							
Ethylbenzene	0.56	U	2.5	ppbv							
Methylene chloride	2.4	U	2.5	ppbv							
Styrene	0.31	U	2.5	ppbv							
Tetrachloroethene	0.50	U	2.5	ppbv							
Toluene	0.41	U	2.5	ppbv							
trans-1,2-Dichloroethene	0.60	U	2.5	ppbv							
trans-1,3-Dichloropropene	0.37	U	2.5	ppbv							
Trichloroethene	0.31	U	2.5	ppbv							
Trichlorofluoromethane	0.52	U	2.5	ppbv							
Vinyl acetate	0.51	U	2.5	ppbv							
Vinyl chloride	0.60	U	2.5	ppbv							
Xylenes (Total)	1.0	U	2.5	ppbv							
Surrogate: 4-Bromofluorobenzene	*26*			*ppbv*	*31.2*		*83.5*	*64-124*			

LCS (1D20020-BS1) Prepared: 04/20/2011 21:13 Analyzed: 04/21/2011 00:57

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1-Dichloroethene	9.8		2.5	ppbv	10.0		98.1	53-175			
Benzene	9.8		2.5	ppbv	10.0		97.8	65-133			
Chlorobenzene	9.9		2.5	ppbv	10.0		99.4	56-158			
Toluene	9.5		2.5	ppbv	10.0		95.3	55-138			

QUALITY CONTROL

Volatile Organic Compounds by GCMS - Quality Control

Batch 1D20020 - Same

LCS (1D20020-BS1) Continued Prepared: 04/20/2011 21:13 Analyzed: 04/21/2011 00:57

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Trichloroethene	8.1		2.5	ppbv	10.0		80.9	59-133			
Surrogate: 4-Bromofluorobenzene	*28*			*ppbv*	*31.2*		*88.7*	*64-124*			

Matrix Spike (1D20020-MS1) Prepared: 04/20/2011 21:13 Analyzed: 04/21/2011 01:28

Source: B101876-02

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1-Dichloroethene	95	E	2.5	ppbv	10.0	66	292	53-175			QM-05
Benzene	10		2.5	ppbv	10.0	0.42 U	103	65-133			
Chlorobenzene	10		2.5	ppbv	10.0	0.38 U	102	56-158			
Toluene	9.1		2.5	ppbv	10.0	0.41 U	90.9	55-138			
Trichloroethene	9.8		2.5	ppbv	10.0	0.31 U	98.5	59-133			
Surrogate: 4-Bromofluorobenzene	*29*			*ppbv*	*31.2*		*92.7*	*64-124*			

Matrix Spike Dup (1D20020-MSD1) Prepared: 04/20/2011 21:13 Analyzed: 04/21/2011 01:58

Source: B101876-02

Analyte	Result	Flag	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1-Dichloroethene	89	E	2.5	ppbv	10.0	66	226	53-175	7.17	43	QM-05
Benzene	11		2.5	ppbv	10.0	0.42 U	108	65-133	4.83	35	
Chlorobenzene	11		2.5	ppbv	10.0	0.38 U	110	56-158	7.62	20	
Toluene	10		2.5	ppbv	10.0	0.41 U	99.7	55-138	9.23	25	
Trichloroethene	10		2.5	ppbv	10.0	0.31 U	104	59-133	5.72	14	
Surrogate: 4-Bromofluorobenzene	*30*			*ppbv*	*31.2*		*95.1*	*64-124*			

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.
QM-05	The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data is acceptable.

ENVIRONMENTAL CONSERVATION LABORATORIES
10775 Central Port Dr. Orlando, FL 32824 (407) 826-5314 Fax (407) 850-6945
4810 Executive Park Court, Suite 211 Jacksonville, FL 32216-6069 (904) 296-3007 Fax (904) 296-6210
102-A Woodwinds Industrial Ct. Cary, NC 27511 (919) 467-3090 Fax (919) 467-3515

CHAIN-OF-CUSTODY RECORD

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Client/Owner: Golder Associates, Inc. (GO007)		Project/PO Number: 073-9612711.500	
Address: 5B Oak Branch Drive		Project Name/Site: Randolph County LF	
City/State/Zip: Greensboro, NC 27407		PO # / Billing Info	
Tel (336) 852-4903	Fax (336) 852-4904	Reporting Contact: David Reedy II	
Sampler(s) Name, Affiliation (Print): N. Rathjen		Billing Contact: Accounts Payable	
Sampler(s) Signature: Nath Rath		Site Location / Time Zone: Randolph Co. / Eastern	

Requested Analyses: TO15 (SUMMA)

Requested Turnaround Times

Note : Rush requests subject to acceptance by the facility

✓ Standard

___ Expedited

Due ___/___/___

Lab Workorder: B101631

Item #	Sample ID (Field Identification)	Collection Date	Collection Time	Comp / Grab	Matrix (see codes)	Total # of Containers	Preservation (See Codes) (Combine as necessary)	Sample Comments
	MW-1	4/12/11	1531	G	AIR	1	X	
	MW-7	4/12/11	1334	G	AIR	1	X	
	MW-8	4/12/11	1200	G	AIR	1	X	

<-- Total # of Containers

Sample Kit Prepared By: KK	Date/Time: 4-1-11 0836	Relinquished By: Kristie Kelly	Date/Time: 4-1-11 0836	Received By:	Date/Time:
Comments/Special Reporting Requirements: ① Please provide a level 2 data report ② estimated fees $540		Relinquished By: Nath Rath	Date/Time: 4-13-11 0800	Received By: Jamie Shadan	Date/Time: 4/13/11 1315
		Relinquished By: Jamie Shadan	Date/Time: 4/13/11 1400	Received By: Kristie Kelly	Date/Time: 4-14-11 0912
		Cooler #'s & Temps on Receipt: Box		Condition Upon Receipt: ___ Acceptable ___ Unacceptable	

Matrix : GW-Groundwater SO-Soil DW-Drinking Water SE-Sediment SW-Surface Water WW-Wastewater A-Air O-Other (detail in comments)

Preservation: I-Ice H-HCl N-HNO3 S-H2SO4 NO-NaOH O-Other (detail in comments)

Note : All samples submitted to ENCO Labs are in accordance with the terms and conditions listed on the reverse of this form, unless prior written agreements exist

Authorized by Nath Rath

Accepted by ___

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At Golder Associates we strive to be the most respected global group of companies specializing in ground engineering and environmental services. Employee owned since our formation in 1960, we have created a unique culture with pride in ownership, resulting in long-term organizational stability. Golder professionals take the time to build an understanding of client needs and of the specific environments in which they operate. We continue to expand our technical capabilities and have experienced steady growth with employees now operating from offices located throughout Africa, Asia, Australasia, Europe, North America and South America.

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