



*Environmental Challenges*  
**BUSINESS SOLUTIONS**

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July 18, 2013

Mr. Don Heardon  
Compliance Unit  
NCDENR-DVM, Solid Waste Section  
1646 Mail Service Center  
Raleigh, NC 27699-1646



**RE: Facility Permit # 4203**  
**Low Ground Landfill Semi-annual Environmental Monitoring Report**  
**Roanoke Rapids, NC**  
**EarthCon Consultants, P.C. Project No. 25.20090383.13**

Dear Mr. Heardon;

On behalf of International Paper Company, EarthCon Consultants P.C. (EarthCon) is submitting the attached Semi-annual Environmental Monitoring Report for the May 2013 sampling event completed for the above referenced site. Also enclosed is the North Carolina (NC) Solid Waste Section summary table along with the laboratory report and the EarthCon Quality Assurance Review of the laboratory data.

The May 2013 sampling activities were conducted by EarthCon and included obtaining depth to groundwater measurements from the five site monitoring wells (MWLG-1, MWLG-3, MWLG-5, MWLG-6, and MWLG-7), and sampling wells in general accordance with low flow purging and sampling EPA Operating Procedures. Copies of the field sampling forms and field notes completed by EarthCon personnel are attached to this report. The groundwater samples were preserved according to EPA protocol and shipped to Columbia Analytical Services (ALS) in Jacksonville, FL, a North Carolina certified laboratory. The analytical results for this sampling event are attached.

With the exception of iron, manganese, sulfate, nitrate and pH, the laboratory analysis of samples collected from site monitoring wells were below the applicable NC 2L standards. The exceptions are summarized below:

- The results of three groundwater samples (MW-LG1, MG-LG3 and MW-LG5) exceeded the NC 2L standard of 300 ug/L for iron.
- The results of five groundwater samples (MW-LG1, MW-LG3, MW-LG5, MW-LG6, and MG-LG7) exceeded the NC 2L standard of 50 ug/L for manganese.
- The result of one groundwater sample (MW-LG3) exceeded the NC 2L standard of 250 mg/L for sulfate.
- The results of two groundwater samples (MW-LG1 and MW-LG5) were slightly below the NC 2L range of 6.5 to 8.5 S.U. for pH.
- The results of one groundwater sample (MW-LG3) exceeded the NC 2L standard of 10 mg/L for nitrate.

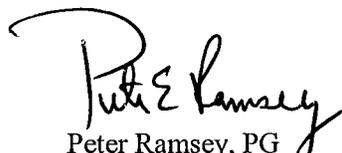
Groundwater analyses from monitoring well MW-LG3 have historically shown sporadic nitrate concentrations which are elevated above the generally observed trends. Occasionally the nitrate value exceeds the NC 2L standard of 10 mg/L, as was observed in this sampling event where the reported value was 36.3 mg/L. Over the last 10 monitoring events, nitrate was observed during one other event at a similar concentration.

The detected manganese, iron, pH, nitrate, and sulfate concentrations in site wells are reported within the range of background concentrations for this site. Previously, the Solid Waste Section has waived the requirement to prepare a Water Quality Assessment Plan for this site. EarthCon continues to concur with this waiver and does not recommend any changes to the monitoring program at this time.

If you have any questions on this report feel free to call at 770-973-2100.

Sincerely,

  
Patrick Kelley, CHMM  
Senior Scientist

  
Peter Ramsey, PG  
Project Manager

  
Russell K. Schlecht, PE  
Principal Engineer

cc: Brent Sasser, International Paper

Attachments:

- NC Environmental Monitoring Report Form
- NC Solid Waste Section Summary Table
- Field Notes and Chain-of- Custody
- ALS Laboratory Analytical Report
- EarthCon Quality Assurance Review

DENR USE ONLY

Paper Report

Electronic Data - Email CD (data loaded: Yes / No)

Doc/Event #:

NC DENR  
Division of Waste Management - Solid Waste

# Environmental Monitoring Reporting Form

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

**Instructions:**

- Prepare one form for each individually monitored unit.
- Please type or print legibly.
- Attach a notification table with values that attain or exceed NC 2L groundwater standards or NC 2B surface water standards. The notification must include a preliminary analysis of the cause and significance of each value. (e.g. naturally occurring, off-site source, pre-existing condition, etc.).
- Attach a notification table of any groundwater or surface water values that equal or exceed the reporting limits.
- Attach a notification table of any methane gas values that attain or exceed explosive gas levels. This includes any structures on or nearby the facility (NCAC 13B .1629 (4)(a)(i)).
- In accordance with NC General Statutes Chapter 89C and 89E and NC Solid Waste Management Rules 15A NCAC 13B, be sure to affix a seal to the bottom of this page, when applicable.
- Send the original signed and sealed form, any tables, and Electronic Data Deliverable to: Compliance Unit, NCDENR-DWM, Solid Waste Section, 1646 Mail Service Center, Raleigh, NC 27699-1646.

**Solid Waste Monitoring Data Submittal Information**

Name of entity submitting data (laboratory, consultant, facility owner):

EarthCon Consultants, P.C.

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

Name: Patrick Kelley

Phone: 678-569-2860

E-mail: pkelley@earthcon.com

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)
Low Ground Landfill Roanoke Rapids, NC	Kapstone Mill 100 Gaston Road Roanoke Rapids, NC	42 03	.0500	May 21, 2013

**Environmental Status: (Check all that apply)**

- Initial/Background Monitoring     Detection Monitoring     Assessment Monitoring     Corrective Action

**Type of data submitted: (Check all that apply)**

- Groundwater monitoring data from monitoring wells     Methane gas monitoring data  
 Groundwater monitoring data from private water supply wells     Corrective action data (specify) \_\_\_\_\_  
 Leachate monitoring data     Other(specify) \_\_\_\_\_  
 Surface water monitoring data

**Notification attached?**

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

**Certification**

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

Peter E. Ramsey

Senior Geologist

678-569-2882

Facility Representative Name (Print)

Title

(Area Code) Telephone Number

Signature

Date

Affix NC Licensed/Professional Geologist/Engineer Seal here:



**International Paper**  
**Roanoke Rapids Mill**  
**100 Gaston Road Low Ground Landfill**  
**Roanoke Rapids, NC Monitoring Wells**

Samples collected on 5/21/13 by Kent Davis of EarthCon Consultants, PC (Contact: Patrick Kelley, EarthCon Consultants, PC  
 Samples were analyzed by \*ALS Environmental Inc NC Cert. #: 5271 | Phone 770-973-2100 #2860 or email, pkelley@earthcon.com

FACILITY PERMIT	SAMPLE ID	CAS Number	SWS ID	PARAMETER	RESULT	UNITS	LAB QUALIFIER	DILUTION FACTOR	COLLECT DATE	EXTRACTION DATE	ANALYSIS DATE
42-03	MW-LG 1	7440-38-2	14	Arsenic	1.4	ug/L		1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG 1	7440-39-3	15	Barium	114	ug/L		1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG 1	316	316	Biochemical Oxygen Demand	4.0	mg/L	U	2.0	5/21/13	NA	5/22/13
42-03	MW-LG 1	7440-43-9	34	Cadmium	0.13	ug/L	J	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG 1	317	317	Chemical Oxygen Demand	16.0	mg/L	U	1.0	5/21/13	5/26/13	5/28/13
42-03	MW-LG 1	16887-00-6	301	Chloride	2.66	mg/L		1.0	5/21/13	NA	5/22/13
42-03	MW-LG 1	7440-47-3	51	Chromium	1.7	ug/L		1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG 1	7440-50-8	54	Copper	4.6	ug/L		1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG 1	16984-48-8	312	Fluoride	0.18	mg/L	J	1.0	5/21/13	NA	5/22/13
42-03	MW-LG 1	7439-89-6	340	Iron	3.7	mg/L		1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG 1	7439-92-1	131	Lead	2.29	ug/L		1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG 1	7439-96-5	342	Manganese	980	ug/L		1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG 1	7439-97-6	132	Mercury	0.03	ug/L	J	1.0	5/21/13	5/24/13	5/24/13
42-03	MW-LG 1	14797-55-8	303	Nitrate	0.14	mg/L	J	1.0	5/21/13	NA	5/22/13
42-03	MW-LG 1	321	321	pH - Lab	6.41	pH UNITS	J	1.0	5/21/13	NA	5/23/13
42-03	MW-LG 1	7782-49-2	183	Selenium	1.1	ug/L	U	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG 1	7440-22-4	184	Silver	0.06	ug/L	U	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG 1	14808-79-8	315	Sulfate	25.8	mg/L		1.0	5/21/13	NA	5/22/13
42-03	MW-LG 1	311	311	Total Dissolved Solids	168	mg/L		4.0	5/21/13	NA	5/22/13
42-03	MW-LG 1	E-10195	357	Total Organic Carbon	2.7	mg/L		1.0	5/21/13	NA	6/3/13
42-03	MW-LG 1	7440-66-6	213	Zinc	9.2	ug/L	U	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG 1			Total Organic Halides	0.1	mg/L		1.0	5/21/13	NA	5/30/13
42-03	MW-LG 3	7440-38-2	14	Arsenic	0.5	ug/L	U	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG 3	7440-39-3	15	Barium	67.2	ug/L	U	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG 3	316	316	Biochemical Oxygen Demand	4.0	mg/L	U	2.0	5/21/13	NA	5/22/13
42-03	MW-LG 3	7440-43-9	34	Cadmium	0.25	ug/L	J	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG 3	317	317	Chemical Oxygen Demand	26	mg/L		1.0	5/21/13	5/26/13	5/28/13
42-03	MW-LG 3	16887-00-6	301	Chloride	59.2	mg/L		1.0	5/21/13	NA	5/22/13
42-03	MW-LG 3	7440-47-3	51	Chromium	0.6	ug/L	J	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG 3	7440-50-8	54	Copper	0.8	ug/L	J	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG 3	16984-48-8	312	Fluoride	0.27	mg/L		1.0	5/21/13	NA	5/22/13
42-03	MW-LG 3	7439-89-6	340	Iron	0.56	mg/L	J	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG 3	7439-92-1	131	Lead	0.12	ug/L	U	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG 3	7439-96-5	342	Manganese	1410	ug/L		1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG 3	7439-97-6	132	Mercury	0.02	ug/L	U	1.0	5/21/13	5/24/13	5/24/13
42-03	MW-LG 3	14797-55-8	303	Nitrate	36.3	mg/L		10.0	5/21/13	NA	5/22/13
42-03	MW-LG 3	321	321	pH - Lab	6.98	pH UNITS	J	1.0	5/21/13	NA	5/23/13
42-03	MW-LG 3	7782-49-2	183	Selenium	1.6	ug/L	J	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG 3	7440-22-4	184	Silver	0.06	ug/L	U	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG 3	14808-79-8	315	Sulfate	340	mg/L		10.0	5/21/13	NA	5/22/13
42-03	MW-LG 3	311	311	Total Dissolved Solids	1580	mg/L		4.0	5/21/13	NA	5/22/13
42-03	MW-LG 3	E-10195	357	Total Organic Carbon	9.1	mg/L		1.0	5/21/13	NA	6/3/13
42-03	MW-LG 3	7440-66-6	213	Zinc	2.0	mg/L	J	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG 3			Total Organic Halides	0.1	mg/L	U	1.0	5/21/13	NA	5/30/13

International Paper  
Roanoke Rapids Mill  
100 Gaston Road Low Ground Landfill  
Roanoke Rapids, NC Monitoring Wells

Samples collected on 5/21/13 by Kent Davis of EarthCon Consultants, PC Contact: Patrick Kelley, EarthCon Consultants, PC  
Samples were analyzed by \*ALS Environmental Inc NC Cert. #: 5271 Phone 770-973-2100 #2860 or email. pkelley@earthcon.com

FACILITY PERMIT	SAMPLE ID	CAS Number	SWS ID	PARAMETER	RESULT	UNITS	LAB QUALIFIER	DILUTION FACTOR	COLLECT DATE	EXTRACTION DATE	ANALYSIS DATE
42-03	MW-LG5	7440-38-2	14	Arsenic	2.9	ug/L		1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG5	7440-39-3	15	Barium	120	ug/L		1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG5	316	316	Biochemical Oxygen Demand	4.0	mg/L	U	2.0	5/21/13	NA	5/29/13
42-03	MW-LG5	7440-43-9	34	Cadmium	0.10	ug/L	U	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG5	317	317	Chemical Oxygen Demand	35	mg/L		1.0	5/21/13	5/26/13	5/28/13
42-03	MW-LG5	16887-00-6	301	Chloride	2.78	mg/L		1.0	5/21/13	NA	5/22/13
42-03	MW-LG5	7440-47-3	51	Chromium	1.4	ug/L		1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG5	7440-50-8	54	Copper	1.1	ug/L		1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG5	16884-48-8	312	Fluoride	0.18	mg/L	J	1.0	5/21/13	NA	5/22/13
42-03	MW-LG5	7439-89-6	340	Iron	16.2	mg/L		1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG5	7439-92-1	131	Lead	0.15	ug/L	J	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG5	7439-96-5	342	Manganese	10500	ug/L		1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG5	7439-97-6	132	Mercury	0.02	ug/L	U	1.0	5/21/13	5/24/13	5/24/13
42-03	MW-LG5	14797-55-8	303	Nitrate	0.03	mg/L	U	1.0	5/21/13	NA	5/22/13
42-03	MW-LG5	321	321	pH - Lab	6.45	pH UNITS	J	1.0	5/21/13	NA	5/23/13
42-03	MW-LG5	7782-49-2	183	Selenium	1.1	ug/L	U	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG5	7440-22-4	184	Silver	0.06	ug/L	U	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG5	14808-79-8	315	Sulfate	173	mg/L		2.0	5/21/13	NA	5/22/13
42-03	MW-LG5	311	311	Total Dissolved Solids	502	mg/L		1.0	5/21/13	NA	5/22/13
42-03	MW-LG5	E-10195	357	Total Organic Carbon	8.7	mg/L		1.0	5/21/13	NA	6/9/13
42-03	MW-LG5	7440-66-6	213	Zinc	9.6	mg/L	U	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG5		213	Total Organic Halides	0.1	mg/L		1.0	5/21/13	NA	5/30/13
42-03	MW-LG6	7440-38-2	14	Arsenic	0.5	ug/L	U	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG6	7440-39-3	15	Barium	448	ug/L		1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG6	316	316	Biochemical Oxygen Demand	2.9	mg/L		1.0	5/21/13	NA	5/22/13
42-03	MW-LG6	7440-43-9	34	Cadmium	0.10	ug/L	U	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG6	317	317	Chemical Oxygen Demand	55	mg/L	U	1.0	5/21/13	5/26/13	5/28/13
42-03	MW-LG6	16887-00-6	301	Chloride	23.6	mg/L		1.0	5/21/13	NA	5/22/13
42-03	MW-LG6	7440-47-3	51	Chromium	3.2	ug/L		1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG6	7440-50-8	54	Copper	0.8	ug/L	J	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG6	16884-48-8	312	Fluoride	0.30	mg/L		1.0	5/21/13	NA	5/22/13
42-03	MW-LG6	7439-89-6	340	Iron	0.13	mg/L		1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG6	7439-92-1	131	Lead	0.12	ug/L	U	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG6	7439-96-5	342	Manganese	1320	ug/L		1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG6	7439-97-6	132	Mercury	0.02	ug/L	U	1.0	5/21/13	5/24/13	5/24/13
42-03	MW-LG6	14797-55-8	303	Nitrate	0.03	mg/L	U	1.0	5/21/13	NA	5/22/13
42-03	MW-LG6	321	321	pH - Lab	7.35	pH UNITS	J	1.0	5/21/13	NA	5/23/13
42-03	MW-LG6	7782-49-2	183	Selenium	1.1	ug/L	U	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG6	7440-22-4	184	Silver	0.06	ug/L	U	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG6	14808-79-8	315	Sulfate	75.4	mg/L		1.0	5/21/13	NA	5/22/13
42-03	MW-LG6	311	311	Total Dissolved Solids	2070	mg/L		4.0	5/21/13	NA	5/22/13
42-03	MW-LG6	E-10195	357	Total Organic Carbon	17.6	mg/L	U	1.0	5/21/13	NA	6/9/13
42-03	MW-LG6	7440-66-6	213	Zinc	1.6	ug/L	U	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG6		213	Total Organic Halides	0.1	mg/L	U	1.0	5/21/13	NA	5/30/13

**International Paper**  
**Roanoke Rapids Mill**  
 100 Gaston Road Low Ground Landfill  
 Roanoke Rapids, NC Monitoring Wells

Samples collected on 5/21/13 by Kent Davis of EarthCon Consultants, PC Contact: Patrick Kelley, EarthCon Consultants, PC  
 Samples were analyzed by \*ALS Environmental Inc NC Cert. #: 5271 Phone 770-973-2100 #2860 or email, pkelley@earthcon.com

FACILITY PERMIT	SAMPLE ID	CAS Number	SWS ID	PARAMETER	RESULT	UNITS	LAB QUALIFIER	DILUTION FACTOR	COLLECT DATE	EXTRACTION DATE	ANALYSIS DATE
42-03	MW-LG7	7440-38-2	14	Arsenic	0.5	ug/L	U	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG7	7440-39-3	15	Barium	343	ug/L	U	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG7	316	316	Biochemical Oxygen Demand	4.0	mg/L	U	2.0	5/21/13	NA	5/22/13
42-03	MW-LG7	7440-43-9	34	Cadmium	0.10	ug/L	U	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG7	317	317	Chemical Oxygen Demand	16	mg/L	U	1.0	5/21/13	5/26/13	5/28/13
42-03	MW-LG7	16887-00-6	301	Chloride	24.2	mg/L	U	1.0	5/21/13	NA	5/22/13
42-03	MW-LG7	7440-47-3	51	Chromium	0.6	ug/L	J	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG7	7440-50-8	54	Copper	0.9	ug/L	J	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG7	16984-48-8	312	Fluoride	0.25	mg/L	U	1.0	5/21/13	NA	5/22/13
42-03	MW-LG7	7439-89-6	340	Iron	0.03	mg/L	U	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG7	7439-92-1	131	Lead	0.12	ug/L	U	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG7	7439-96-5	342	Manganese	72	ug/L	U	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG7	7439-97-6	132	Mercury	0.02	ug/L	U	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG7	14797-55-8	303	Nitrate	0.18	mg/L	U	1.0	5/21/13	NA	5/22/13
42-03	MW-LG7	321	321	pH - Lab	7.29	pH UNITS	J	1.0	5/21/13	NA	5/23/13
42-03	MW-LG7	7782-49-2	183	Selenium	1.1	ug/L	U	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG7	7440-22-4	184	Silver	0.06	ug/L	U	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG7	14808-79-8	315	Sulfate	67.5	mg/L	U	1.0	5/21/13	NA	5/22/13
42-03	MW-LG7	311	311	Total Dissolved Solids	1640	mg/L	U	4.0	5/21/13	NA	5/22/13
42-03	MW-LG7	E-10195	357	Total Organic Carbon	5.5	mg/L	U	1.0	5/21/13	NA	6/3/13
42-03	MW-LG7	7440-66-6	213	Zinc	1.3	ug/L	U	1.0	5/21/13	5/24/13	5/29/13
42-03	MW-LG7			Total Organic Halides	0.1	mg/L	U	1.0	5/21/13	NA	5/30/13

\*ALS Environmental is formerly known as CAS Inc.  
 U - Undetected above the MRL/MDL  
 J - Estimated value

Prepared by: **SL**  
 Checked by: **AT**  
 Date: **5/27/2013**  
**AT 7-1-13**

WELL No. <u>MW-1</u>	PROJECT #	LOCATION <u>Roadside Exp. ds, Wc</u>	DATE <u>5/21/13</u>
SAMPLE No.	PROJECT NAME <u>FR Roadside Exp. ds</u>	FIELD PERSONNEL/COMPANY <u>F. Davis</u>	
SAMPLE TIME: <u>1540</u>	SITE	FIELD CONDITIONS/WEATHER <u>Partly Cloudy 80°</u>	

<b>Well Condition Inspection (circle one)</b> cover: <u>locked</u> not locked number: <u>legible</u> not legible outer casing: <u>good</u> fair poor inner casing: <u>good</u> fair poor well photographed: yes <u>no</u>	<b>Equipment Cleaning Procedures</b> - potable water and phosphate-free soap <input checked="" type="checkbox"/> - potable water rinse - water rinse: distilled <input checked="" type="checkbox"/> deionized <input type="checkbox"/> - solvent rinse: acetone hexane - air dry
--	---

Casing Diameter: (circle one) <u>2"</u> 4" 6" Other: _____	Casing Volume Calculation: $(\pi r^2 h) (7.48 \text{ gal/ft}^3)$ Casing Volume (gallons/ft) for: <u>2" = 0.163</u> ; 4" = 0.653; 6" = 1.47 Casing Volume (liters/ft) for: 2" = 0.617; 4" = 2.47; 6" = 5.56
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Depth to Water (feet): <u>7.72</u> Depth of Well (feet): <u>16.61</u> Water Column (feet): <u>8.89</u> Casing Volume (gallons): <u>1.45</u> Calculated Purge Volume (gallons): <u>4.35</u> Actual Purge Volume (gallons): <u>1.90</u>	Measuring Point Elevation (feet): _____ Groundwater Surface Elevation: _____ LNAPL present: _____ thickness: _____ DNAPL present: _____ thickness: _____ Remarks: _____
--	---

Well Evacuation  
 Water level recovery is: very slow    slow    moderate    fast                      Bailed dry:    yes    no

TIME 2400 hrs	CUMULATIVE VOLUME (gal)	TEMPERATURE (°C)	pH	Dissolved Oxygen (mg/L)	ORP (mV)	CONDUCTIVITY (µs/cm)	TURBIDITY (NTU)	ODOR/COLOR/ REMARKS
1451	0							PURGE START
1454	—	16.41	6.23	0.59	35.9	223	99	8.58
1505	0.75	16.28	5.70	0.63	-87.7	163	38.2	9.79
1515	1.25	16.07	5.69	0.39	-110.2	173	11.5	10.61
1525	1.75	16.25	5.75	0.27	-108.6	183	<del>11.5</del> 9.84	11.36

Measurement and Sampling Equipment			
Type <u>Water Sampling Kob.</u>	Manufacturer <u>YSI</u> <u>LAURENTE</u>	Model # <u>556</u> <u>ZOROCUR</u>	Calibration Date <u>5/21/13</u> <u>5/21/13</u>

SAMPLE NUMBER	ANALYTICAL METHOD	BOTTLE TYPE/ PRESERVATIVES	QA REMARKS
	TOC	40ml / HCl	
	COD	125ml / H <sub>2</sub> SO <sub>4</sub>	
	TOC	1L / H <sub>2</sub> SO <sub>4</sub>	
	Metals	500ml / HNO <sub>3</sub>	

cond, TDS, Cl, F  
SO<sub>4</sub>, NO<sub>3</sub>, BOB      500ml / —

Start purge - 1451  
 End purge - 1526  
 Sample - 1540

(initials)







Groundwater Sampling Record

WELL No. MW-6 PROJECT # \_\_\_\_\_ LOCATION Roanoke Rapids, NC DATE 5/21/13  
 SAMPLE No. \_\_\_\_\_ PROJECT NAME TP Roanoke Rapids FIELD PERSONNEL/COMPANY P. Davis  
 SAMPLE TIME: 0915 SITE \_\_\_\_\_ FIELD CONDITIONS/WEATHER Partly cloudy 70°

**Well Condition Inspection (circle one)**  
 cover: locked not locked  
 number: legible not legible  
 outer casing: good fair poor  
 inner casing: good fair poor  
 well photographed: yes no

**Equipment Cleaning Procedures**  
 - potable water and phosphate-free soap   
 - potable water rinse  
 - water rinse: distilled  deionized  
 - solvent rinse: acetone hexane  
 - air dry

Casing Diameter: (circle one) 2" 4" 6" Other: \_\_\_\_\_  
 Casing Volume Calculation:  $(\pi r^2 h)(7.48 \text{ gal/ft}^3)$   
 Casing Volume (gallons/ft) for: 2" = 0.163; 4" = 0.653; 6" = 1.47  
 Casing Volume (liters/ft) for: 2" = 0.617; 4" = 2.47; 6" = 5.56

Depth to Water (feet): 8.38 Measuring Point Elevation (feet): \_\_\_\_\_  
 Depth of Well (feet): 18.95 Groundwater Surface Elevation: \_\_\_\_\_  
 Water Column (feet): 10.57 LNAPL present: \_\_\_\_\_ thickness: \_\_\_\_\_  
 Casing Volume (gallons): 1.7 DNAPL present: \_\_\_\_\_ thickness: \_\_\_\_\_  
 Calculated Purge Volume (gallons): 5.2 Remarks: \_\_\_\_\_  
 Actual Purge Volume (gallons): 2.6

Well Evacuation  
 Water level recovery is: very slow slow moderate fast Bailed dry: yes no MLL

TIME 2400 hrs	CUMULATIVE VOLUME (gal)	TEMPERATURE (°C)	pH	Dissolved Oxygen (mg/L)	ORP (mV)	CONDUCTIVITY (µs/cm)	TURBIDITY (NTU)	ODOR/COLOR/REMARKS
0817	0							PURGE START
0820	-	18.46	6.70	0.91	-273.2	2728	48.0	10.28
0830	0.8	18.35	6.57	0.54	-281.7	2723	5.14	11.17
0840	1.4	18.46	6.63	0.45	-246.6	2717	2.26	11.44
0850	1.9	18.48	6.66	0.38	-285.6	2708	2.28	11.68
0900	2.4	18.51	6.68	0.33	-276.5	2703	1.05	11.88

Measurement and Sampling Equipment

Type	Manufacturer	Model #	Calibration Date
<u>Water Quality</u>	<u>YSI</u>	<u>556</u>	<u>5/21/13</u>
<u>Turbidity</u>	<u>Lamotte</u>	<u>2020 WP</u>	<u>5/21/13</u>
<u>Peristaltic Pump</u>	<u>Geopump</u>		

SAMPLE NUMBER	ANALYTICAL METHOD	BOTTLE TYPE/	PRESERVATIVES	QA REMARKS
	TOC	40ml	1 HCl	
	COD	125ml	1 H2SO4	
	TOX	1 Liter	1 H2SO4	
	Metals	500ml	1 HNO3	

COND, TA, S, Cl, F  
SO4 NO3 BOB

\* Dup-1 collected here \*

Start Purge - 0817  
 End Purge - 0900  
 Sample - 0915







June 05, 2013

Service Request No:J1302840

Mr. Peter Ramsey  
EarthCon Site Services Inc  
1880 West Oak Parkway  
Building 100, Suite 106  
Marietta, GA 30062

**Laboratory Results for: IP Roanoke Rapids**

Dear Mr.Ramsey,

Enclosed are the results of the sample(s) submitted to our laboratory May 22, 2013  
For your reference, these analyses have been assigned our service request number **J1302840**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. In accordance to the NELAC 2003 Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Please contact me if you have any questions. My extension is 4410. You may also contact me via email at [Jerry.Allen@alsglobal.com](mailto:Jerry.Allen@alsglobal.com).

Respectfully submitted,

**ALS Group USA, Corp. dba ALS Environmental**

Jerry Allen  
Project Manager

ADDRESS 9143 Philips Highway, Suite 200, Jacksonville, FL 32256  
PHONE +1 904 739 2277 FAX +1 904 739 2011  
ALS Group USA, Corp.  
dba ALS Environmental



### State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
Florida Department of Health	E82502	6/30/2013
North Carolina Department of Environment and Natural Resources	527	12/31/2013
Virginia Environmental Accreditation Program	460191	12/14/2013
Louisiana Department of Environmental Quality	02086	6/30/2013
Georgia Department of Natural Resources	958	6/30/2013
Kentucky Division of Waste Management	63	7/5/2013
South Carolina Department of Health and Environmental Control	96021001	6/30/2013
Maine Department of Health and Human Services	2011006	2/3/2015
Pennsylvania Department of Environmental Protection	68-04835	8/31/2013

## Data Qualifiers

### CAS Standard

- + Possible Tedlar bag artifact.
- A TIC is a suspected aldol-condensation product
- B Analyte found in the associated method blank as well as in the sample.
- BC Reported results are not blank corrected.
- BH The back section of the tube yielded higher results than the front.
- BT Results indicated possible breakthrough; back section  $\geq 10\%$  front section.
  - C Result identification confirmed.
  - D Compound identified in an analysis at a secondary dilution factor
  - D Spike was diluted out
- DE Reported results are corrected for desorption efficiency.
  - E Estimated value. Concentration above calibration range
  - E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- H1 Sample analysis performed past holding time. See case narrative.
- H2 Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
- H3 Sample was received and analyzed past holding time.
- H4 Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
  - I Internal standard not within the specified limits. See case narrative.
  - J Estimated Value. Concentration found below MRL.
- K A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
- K Analyte was detected above the method reporting limit prior to normalization.
- L1 Laboratory control sample recovery outside the specified limits; results may be biased high.
- L2 Laboratory control sample recovery outside the specified limits; results may be biased low.
- L3 Laboratory control sample recovery outside the specified limits.
- M Matrix interference; results may be biased high.
- M The duplicate injection precision not met.
- M1 Matrix interference due to coelution with a non-target compound; results may be biased high.
- N Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- P Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
- P Pesticide/Aroclor target analyte  $> 40\%$  difference for detected concentrations between GC columns
- Q Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
- R Duplicate Precision not met.
- R1 Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
- S Surrogate recovery not within specified limits.

## Data Qualifiers

### CAS Standard

- S The reported value was determined by the Method of Standard Additions (MSA).
- T Analyte is a tentatively identified compound, result is estimated.
- U Compound was analyzed for, but was not detected (ND).
- V1 The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
- V2 The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
- W Result quantified, but the corresponding peak was detected outside the generated retention time window.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- X See case narrative.
- Y Recovery outside limits
- Y The chromatogram resembles a petroleum product but does not match the calibration standard.
- Z The chromatogram does not resemble a petroleum product.
- i The MRL/MDL has been elevated due to a matrix interference.

# ALS Laboratory Group

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## Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

**Client:** EarthCon Site Services Inc  
**Project:** IP Roanoke Rapids

**Service Request:**J1302840

**SAMPLE CROSS-REFERENCE**

<u>SAMPLE #</u>	<u>CLIENT SAMPLE ID</u>	<u>DATE</u>	<u>TIME</u>
J1302840-001	MW-6	5/21/2013	0915
J1302840-002	DUP-1	5/21/2013	0000
J1302840-003	MW-5	5/21/2013	1115
J1302840-004	MW-3	5/21/2013	1230
J1302840-005	MW-7	5/21/2013	1445
J1302840-006	MW-1	5/21/2013	1540

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** EarthCon Site Services Inc  
**Project:** IP Roanoke Rapids  
**Sample Matrix:** Water  
**Sample Name:** MW-6  
**Lab Code:** J1302840-001

**Service Request:** J1302840  
**Date Collected:** 05/21/13 09:15  
**Date Received:** 05/22/13 09:06

**Basis:** NA

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic, Total Recoverable	6020	0.5 U	ug/L	1.0	0.5	1	05/29/13 01:35	5/24/13	
Barium, Total Recoverable	6020	448	ug/L	2.0	0.5	1	05/29/13 01:35	5/24/13	
Cadmium, Total Recoverable	6020	0.10 U	ug/L	0.40	0.10	1	05/29/13 01:35	5/24/13	
Chromium, Total Recoverable	6020	3.2	ug/L	1.0	0.2	1	05/29/13 01:35	5/24/13	
Copper, Total Recoverable	6020	0.8 J	ug/L	1.0	0.3	1	05/29/13 01:35	5/24/13	
Iron, Total Recoverable	6010B	130	ug/L	100	3	1	05/29/13 19:30	5/24/13	
Lead, Total Recoverable	6020	0.12 U	ug/L	0.50	0.12	1	05/29/13 01:35	5/24/13	
Manganese, Total Recoverable	6010B	1320	ug/L	10	3	1	05/29/13 19:31	5/24/13	
Mercury, Total	7470A	0.02 U	ug/L	0.10	0.02	1	05/24/13 19:07	5/24/13	
Selenium, Total Recoverable	6020	1.1 U	ug/L	2.0	1.1	1	05/29/13 01:35	5/24/13	
Silver, Total Recoverable	6020	0.06 U	ug/L	0.50	0.06	1	05/29/13 01:35	5/24/13	
Zinc, Total Recoverable	6020	1.6 U	ug/L	5.0	1.6	1	05/29/13 01:35	5/24/13	

Analytical Report

**Client:** EarthCon Site Services Inc  
**Project:** IP Roanoke Rapids  
**Sample Matrix:** Water  
**Sample Name:** MW-6  
**Lab Code:** J1302840-001

**Service Request:** J1302840  
**Date Collected:** 05/21/13 09:15  
**Date Received:** 05/22/13 09:06

**Basis:** NA

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Biochemical Oxygen Demand (BOD)	405.1	2.9	mg/L	2.0	2.0	1	05/22/13	NA	
Carbon, Total Organic (TOC)	415.1	17.6	mg/L	1.0	0.09	1	06/03/13	NA	
Chemical Oxygen Demand, Total	SM21 5220 D	55	mg/L	20	16	1	05/28/13	5/26/13	
Chloride	300.0	23.6	mg/L	0.50	0.11	1	05/22/13	NA	
Conductivity at 25 Degrees Celsius	120.1	2960	uMHOS/cm	1.0	1.0	1	05/26/13	NA	
Fluoride	300.0	0.30	mg/L	0.20	0.02	1	05/22/13	NA	
Nitrate as Nitrogen	300.0	0.03 U	mg/L	0.20	0.03	1	05/22/13	NA	
pH	9040B	7.35	pH Units	-	-	1	05/23/13	NA	H
Solids, Total Dissolved (TDS)	160.1	2070	mg/L	40	40	4	05/22/13	NA	
Sulfate	300.0	75.4	mg/L	0.50	0.18	1	05/22/13	NA	

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

Client: EarthCon Site Services Inc  
Project: IP Roanoke Rapids  
Sample Matrix: Water  
Sample Name: DUP-1  
Lab Code: J1302840-002

Service Request: J1302840  
Date Collected: 05/21/13 00:00  
Date Received: 05/22/13 09:06

Basis: NA

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic, Total Recoverable	6020	0.5 U	ug/L	1.0	0.5	1	05/29/13 02:00	5/24/13	
Barium, Total Recoverable	6020	446	ug/L	2.0	0.5	1	05/29/13 02:00	5/24/13	
Cadmium, Total Recoverable	6020	0.10 U	ug/L	0.40	0.10	1	05/29/13 02:00	5/24/13	
Chromium, Total Recoverable	6020	3.6	ug/L	1.0	0.2	1	05/29/13 02:00	5/24/13	
Copper, Total Recoverable	6020	0.9 J	ug/L	1.0	0.3	1	05/29/13 02:00	5/24/13	
Iron, Total Recoverable	6010B	120	ug/L	100	3	1	05/29/13 19:50	5/24/13	
Lead, Total Recoverable	6020	0.12 U	ug/L	0.50	0.12	1	05/29/13 02:00	5/24/13	
Manganese, Total Recoverable	6010B	1330	ug/L	10	3	1	05/29/13 19:50	5/24/13	
Mercury, Total	7470A	0.02 U	ug/L	0.10	0.02	1	05/24/13 19:08	5/24/13	
Selenium, Total Recoverable	6020	1.1 U	ug/L	2.0	1.1	1	05/29/13 02:00	5/24/13	
Silver, Total Recoverable	6020	0.06 U	ug/L	0.50	0.06	1	05/29/13 02:00	5/24/13	
Zinc, Total Recoverable	6020	1.6 U	ug/L	5.0	1.6	1	05/29/13 02:00	5/24/13	

Analytical Report

**Client:** EarthCon Site Services Inc  
**Project:** IP Roanoke Rapids  
**Sample Matrix:** Water  
**Sample Name:** DUP-1  
**Lab Code:** J1302840-002

**Service Request:** J1302840  
**Date Collected:** 05/21/13 00:00  
**Date Received:** 05/22/13 09:06

**Basis:** NA

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Biochemical Oxygen Demand (BOD)	405.1	4.1	mg/L	2.0	2.0	1	05/22/13	NA	
Carbon, Total Organic (TOC)	415.1	17.5	mg/L	1.0	0.09	1	06/03/13	NA	
Chemical Oxygen Demand, Total	SM21 5220 D	55	mg/L	20	16	1	05/28/13	5/26/13	
Chloride	300.0	23.1	mg/L	0.50	0.11	1	05/22/13	NA	
Conductivity at 25 Degrees Celsius	120.1	2950	uMHOS/cm	1.0	1.0	1	05/26/13	NA	
Fluoride	300.0	0.30	mg/L	0.20	0.02	1	05/22/13	NA	
Nitrate as Nitrogen	300.0	0.03 U	mg/L	0.20	0.03	1	05/22/13	NA	
pH	9040B	7.28	pH Units	-	-	1	05/23/13	NA	H
Solids, Total Dissolved (TDS)	160.1	1990	mg/L	40	40	4	05/22/13	NA	
Sulfate	300.0	74.2	mg/L	0.50	0.18	1	05/22/13	NA	

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** EarthCon Site Services Inc  
**Project:** IP Roanoke Rapids  
**Sample Matrix:** Water  
  
**Sample Name:** MW-5  
**Lab Code:** J1302840-003

**Service Request:** J1302840  
**Date Collected:** 05/21/13 11:15  
**Date Received:** 05/22/13 09:06

**Basis:** NA

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic, Total Recoverable	6020	2.9	ug/L	1.0	0.5	1	05/29/13 02:05	5/24/13	
Barium, Total Recoverable	6020	120	ug/L	2.0	0.5	1	05/29/13 02:05	5/24/13	
Cadmium, Total Recoverable	6020	0.10 U	ug/L	0.40	0.10	1	05/29/13 02:05	5/24/13	
Chromium, Total Recoverable	6020	1.4	ug/L	1.0	0.2	1	05/29/13 02:05	5/24/13	
Copper, Total Recoverable	6020	1.1	ug/L	1.0	0.3	1	05/29/13 02:05	5/24/13	
Iron, Total Recoverable	6010B	16200	ug/L	100	3	1	05/29/13 19:59	5/24/13	
Lead, Total Recoverable	6020	0.15 J	ug/L	0.50	0.12	1	05/29/13 02:05	5/24/13	
Manganese, Total Recoverable	6010B	10500	ug/L	10	3	1	05/29/13 19:59	5/24/13	
Mercury, Total	7470A	0.02 U	ug/L	0.10	0.02	1	05/24/13 19:10	5/24/13	
Selenium, Total Recoverable	6020	1.1 U	ug/L	2.0	1.1	1	05/29/13 02:05	5/24/13	
Silver, Total Recoverable	6020	0.06 U	ug/L	0.50	0.06	1	05/29/13 02:05	5/24/13	
Zinc, Total Recoverable	6020	9.6	ug/L	5.0	1.6	1	05/29/13 02:05	5/24/13	

Analytical Report

**Client:** EarthCon Site Services Inc  
**Project:** IP Roanoke Rapids  
**Sample Matrix:** Water  
**Sample Name:** MW-5  
**Lab Code:** J1302840-003

**Service Request:** J1302840  
**Date Collected:** 05/21/13 11:15  
**Date Received:** 05/22/13 09:06

**Basis:** NA

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Biochemical Oxygen Demand (BOD)	405.1	4.0 U	mg/L	4.0	4.0	2	05/22/13	NA	
Carbon, Total Organic (TOC)	415.1	8.7	mg/L	1.0	0.09	1	06/03/13	NA	
Chemical Oxygen Demand, Total	SM21 5220 D	35	mg/L	20	16	1	05/28/13	5/26/13	
Chloride	300.0	2.78	mg/L	0.50	0.11	1	05/22/13	NA	
Conductivity at 25 Degrees Celsius	120.1	611	uMHOS/cm	1.0	1.0	1	05/26/13	NA	
Fluoride	300.0	0.18 J	mg/L	0.20	0.02	1	05/22/13	NA	
Nitrate as Nitrogen	300.0	0.03 U	mg/L	0.20	0.03	1	05/22/13	NA	
pH	9040B	6.45	pH Units	-	-	1	05/23/13	NA	H
Solids, Total Dissolved (TDS)	160.1	502	mg/L	10	10	1	05/22/13	NA	
Sulfate	300.0	173	mg/L	0.50	0.18	1	05/22/13	NA	

Analytical Report

**Client:** EarthCon Site Services Inc  
**Project:** IP Roanoke Rapids  
**Sample Matrix:** Water  
**Sample Name:** MW-3  
**Lab Code:** J1302840-004

**Service Request:** J1302840  
**Date Collected:** 05/21/13 12:30  
**Date Received:** 05/22/13 09:06

**Basis:** NA

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic, Total Recoverable	6020	0.5 U	ug/L	1.0	0.5	1	05/29/13 02:10	5/24/13	
Barium, Total Recoverable	6020	67.2	ug/L	2.0	0.5	1	05/29/13 02:10	5/24/13	
Cadmium, Total Recoverable	6020	0.25 J	ug/L	0.40	0.10	1	05/29/13 02:10	5/24/13	
Chromium, Total Recoverable	6020	0.6 J	ug/L	1.0	0.2	1	05/29/13 02:10	5/24/13	
Copper, Total Recoverable	6020	0.8 J	ug/L	1.0	0.3	1	05/29/13 02:10	5/24/13	
Iron, Total Recoverable	6010B	560	ug/L	100	3	1	05/29/13 20:04	5/24/13	
Lead, Total Recoverable	6020	0.12 U	ug/L	0.50	0.12	1	05/29/13 02:10	5/24/13	
Manganese, Total Recoverable	6010B	1410	ug/L	10	3	1	05/29/13 20:05	5/24/13	
Mercury, Total	7470A	0.02 U	ug/L	0.10	0.02	1	05/24/13 19:15	5/24/13	
Selenium, Total Recoverable	6020	1.6 J	ug/L	2.0	1.1	1	05/29/13 02:10	5/24/13	
Silver, Total Recoverable	6020	0.06 U	ug/L	0.50	0.06	1	05/29/13 02:10	5/24/13	
Zinc, Total Recoverable	6020	2.0 J	ug/L	5.0	1.6	1	05/29/13 02:10	5/24/13	

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** EarthCon Site Services Inc  
**Project:** IP Roanoke Rapids  
**Sample Matrix:** Water  
**Sample Name:** MW-3  
**Lab Code:** J1302840-004

**Service Request:** J1302840  
**Date Collected:** 05/21/13 12:30  
**Date Received:** 05/22/13 09:06

**Basis:** NA

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Biochemical Oxygen Demand (BOD)	405.1	4.0	U mg/L	4.0	4.0	2	05/22/13	NA	
Carbon, Total Organic (TOC)	415.1	9.1	mg/L	1.0	0.09	1	06/03/13	NA	
Chemical Oxygen Demand, Total	SM21 5220 D	26	mg/L	20	16	1	05/28/13	5/26/13	
Chloride	300.0	59.2	mg/L	0.50	0.11	1	05/22/13	NA	
Conductivity at 25 Degrees Celsius	120.1	2180	uMHOS/cm	1.0	1.0	1	05/26/13	NA	
Fluoride	300.0	0.27	mg/L	0.20	0.02	1	05/22/13	NA	
Nitrate as Nitrogen	300.0	36.3	mg/L	2.0	0.3	10	05/22/13	NA	
pH	9040B	6.98	pH Units	-	-	1	05/23/13	NA	H
Solids, Total Dissolved (TDS)	160.1	1580	mg/L	40	40	4	05/22/13	NA	
Sulfate	300.0	340	mg/L	5.0	1.8	10	05/22/13	NA	

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** EarthCon Site Services Inc  
**Project:** IP Roanoke Rapids  
**Sample Matrix:** Water  
**Sample Name:** MW-7  
**Lab Code:** J1302840-005

**Service Request:** J1302840  
**Date Collected:** 05/21/13 14:45  
**Date Received:** 05/22/13 09:06

**Basis:** NA

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date	Date	Q
							Analyzed	Extracted	
Arsenic, Total Recoverable	6020	0.5 U	ug/L	1.0	0.5	1	05/29/13 02:26	5/24/13	
Barium, Total Recoverable	6020	343	ug/L	2.0	0.5	1	05/29/13 02:26	5/24/13	
Cadmium, Total Recoverable	6020	0.10 U	ug/L	0.40	0.10	1	05/29/13 02:26	5/24/13	
Chromium, Total Recoverable	6020	0.6 J	ug/L	1.0	0.2	1	05/29/13 02:26	5/24/13	
Copper, Total Recoverable	6020	0.9 J	ug/L	1.0	0.3	1	05/29/13 02:26	5/24/13	
Iron, Total Recoverable	6010B	30 J	ug/L	100	3	1	05/29/13 20:14	5/24/13	
Lead, Total Recoverable	6020	0.12 U	ug/L	0.50	0.12	1	05/29/13 02:26	5/24/13	
Manganese, Total Recoverable	6010B	72	ug/L	10	3	1	05/29/13 20:15	5/24/13	
Mercury, Total	7470A	0.02 U	ug/L	0.10	0.02	1	05/24/13 19:16	5/24/13	
Selenium, Total Recoverable	6020	1.1 U	ug/L	2.0	1.1	1	05/29/13 02:26	5/24/13	
Silver, Total Recoverable	6020	0.06 U	ug/L	0.50	0.06	1	05/29/13 02:26	5/24/13	
Zinc, Total Recoverable	6020	1.6 U	ug/L	5.0	1.6	1	05/29/13 02:26	5/24/13	

Analytical Report

**Client:** EarthCon Site Services Inc  
**Project:** IP Roanoke Rapids  
**Sample Matrix:** Water  
**Sample Name:** MW-7  
**Lab Code:** J1302840-005

**Service Request:** J1302840  
**Date Collected:** 05/21/13 14:45  
**Date Received:** 05/22/13 09:06

**Basis:** NA

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Biochemical Oxygen Demand (BOD)	405.1	4.0 U	mg/L	4.0	4.0	2	05/22/13	NA	
Carbon, Total Organic (TOC)	415.1	5.5	mg/L	1.0	0.09	1	06/03/13	NA	
Chemical Oxygen Demand, Total	SM21 5220 D	16 U	mg/L	20	16	1	05/28/13	5/26/13	
Chloride	300.0	24.2	mg/L	0.50	0.11	1	05/22/13	NA	
Conductivity at 25 Degrees Celsius	120.1	2450	uMHOS/cm	1.0	1.0	1	05/26/13	NA	
Fluoride	300.0	0.25	mg/L	0.20	0.02	1	05/22/13	NA	
Nitrate as Nitrogen	300.0	0.18 J	mg/L	0.20	0.03	1	05/22/13	NA	
pH	9040B	7.29	pH Units	-	-	1	05/23/13	NA	H
Solids, Total Dissolved (TDS)	160.1	1640	mg/L	40	40	4	05/22/13	NA	
Sulfate	300.0	67.5	mg/L	0.50	0.18	1	05/22/13	NA	

Analytical Report

**Client:** EarthCon Site Services Inc  
**Project:** IP Roanoke Rapids  
**Sample Matrix:** Water  
**Sample Name:** MW-1  
**Lab Code:** J1302840-006

**Service Request:** J1302840  
**Date Collected:** 05/21/13 15:40  
**Date Received:** 05/22/13 09:06

**Basis:** NA

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic, Total Recoverable	6020	1.4	ug/L	1.0	0.5	1	05/29/13 02:31	5/24/13	
Barium, Total Recoverable	6020	114	ug/L	2.0	0.5	1	05/29/13 02:31	5/24/13	
Cadmium, Total Recoverable	6020	0.13 J	ug/L	0.40	0.10	1	05/29/13 02:31	5/24/13	
Chromium, Total Recoverable	6020	1.7	ug/L	1.0	0.2	1	05/29/13 02:31	5/24/13	
Copper, Total Recoverable	6020	4.6	ug/L	1.0	0.3	1	05/29/13 02:31	5/24/13	
Iron, Total Recoverable	6010B	3700	ug/L	100	3	1	05/29/13 20:23	5/24/13	
Lead, Total Recoverable	6020	2.29	ug/L	0.50	0.12	1	05/29/13 02:31	5/24/13	
Manganese, Total Recoverable	6010B	980	ug/L	10	3	1	05/29/13 20:24	5/24/13	
Mercury, Total	7470A	0.03 J	ug/L	0.10	0.02	1	05/24/13 19:18	5/24/13	
Selenium, Total Recoverable	6020	1.1 U	ug/L	2.0	1.1	1	05/29/13 02:31	5/24/13	
Silver, Total Recoverable	6020	0.06 U	ug/L	0.50	0.06	1	05/29/13 02:31	5/24/13	
Zinc, Total Recoverable	6020	9.2	ug/L	5.0	1.6	1	05/29/13 02:31	5/24/13	

Analytical Report

**Client:** EarthCon Site Services Inc  
**Project:** IP Roanoke Rapids  
**Sample Matrix:** Water  
**Sample Name:** MW-1  
**Lab Code:** J1302840-006

**Service Request:** J1302840  
**Date Collected:** 05/21/13 15:40  
**Date Received:** 05/22/13 09:06

**Basis:** NA

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Biochemical Oxygen Demand (BOD)	405.1	4.0 U	mg/L	4.0	4.0	2	05/22/13	NA	
Carbon, Total Organic (TOC)	415.1	2.7	mg/L	1.0	0.09	1	06/03/13	NA	
Chemical Oxygen Demand, Total	SM21 5220 D	16 U	mg/L	20	16	1	05/28/13	5/26/13	
Chloride	300.0	2.66	mg/L	0.50	0.11	1	05/22/13	NA	
Conductivity at 25 Degrees Celsius	120.1	202	uMHOS/cm	1.0	1.0	1	05/26/13	NA	
Fluoride	300.0	0.18 J	mg/L	0.20	0.02	1	05/22/13	NA	
Nitrate as Nitrogen	300.0	0.14 J	mg/L	0.20	0.03	1	05/22/13	NA	
pH	9040B	6.41	pH Units	-	-	1	05/23/13	NA	H
Solids, Total Dissolved (TDS)	160.1	168	mg/L	10	10	1	05/22/13	NA	
Sulfate	300.0	25.8	mg/L	0.50	0.18	1	05/22/13	NA	

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** EarthCon Site Services Inc  
**Project:** IP Roanoke Rapids  
**Sample Matrix:** Water  
  
**Sample Name:** Method Blank  
**Lab Code:** J1302840-MB

**Service Request:** J1302840  
**Date Collected:** NA  
**Date Received:** NA  
  
**Basis:** NA

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date		Q
							Analyzed	Extracted	
Arsenic, Total Recoverable	6020	0.5 U	ug/L	1.0	0.5	1	05/29/13 01:25	5/24/13	
Barium, Total Recoverable	6020	0.5 U	ug/L	2.0	0.5	1	05/29/13 01:25	5/24/13	
Cadmium, Total Recoverable	6020	0.10 U	ug/L	0.40	0.10	1	05/29/13 01:25	5/24/13	
Chromium, Total Recoverable	6020	0.2 U	ug/L	1.0	0.2	1	05/29/13 01:25	5/24/13	
Copper, Total Recoverable	6020	0.3 U	ug/L	1.0	0.3	1	05/29/13 01:25	5/24/13	
Iron, Total Recoverable	6010B	6 J	ug/L	100	3	1	05/29/13 19:21	5/24/13	
Lead, Total Recoverable	6020	0.12 U	ug/L	0.50	0.12	1	05/29/13 01:25	5/24/13	
Manganese, Total Recoverable	6010B	3 U	ug/L	10	3	1	05/29/13 19:23	5/24/13	
Mercury, Total	7470A	0.02 U	ug/L	0.10	0.02	1	05/24/13 19:03	5/24/13	
Selenium, Total Recoverable	6020	1.1 U	ug/L	2.0	1.1	1	05/29/13 01:25	5/24/13	
Silver, Total Recoverable	6020	0.06 U	ug/L	0.50	0.06	1	05/29/13 01:25	5/24/13	
Zinc, Total Recoverable	6020	1.6 U	ug/L	5.0	1.6	1	05/29/13 01:25	5/24/13	

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

Client: EarthCon Site Services Inc  
Project: IP Roanoke Rapids  
Sample Matrix: Water

Service Request: J1302840  
Date Analyzed: 05/22/13 - 06/03/13

Lab Control Sample Summary  
General Chemistry Parameters

Units: mg/L  
Basis: NA

Lab Control Sample  
J1302840-LCS

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Biochemical Oxygen Demand (BOD)	405.1	168	198	85	84.6-115.4
Carbon, Total Organic (TOC)	415.1	49.5	50.0	99	90-110
Chemical Oxygen Demand, Total	SM21 5220 D	493	500	98	95-105
Chloride	300.0	51.5	50.0	103	90-110
Fluoride	300.0	5.35	5.00	107	90-110
Nitrate as Nitrogen	300.0	5.17	5.00	103	90-110
Solids, Total Dissolved (TDS)	160.1	306	300	102	85-115
Sulfate	300.0	53.1	50.0	106	90-110

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

Client: EarthCon Site Services Inc  
Project: IP Roanoke Rapids  
Sample Matrix: Water

Service Request: J1302840  
Date Analyzed: 5/26/13

Lab Control Sample Summary  
General Chemistry Parameters

Units: uMHOS/cm  
Basis: NA

Lab Control Sample  
J1302840-LCS

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Conductivity at 25 Degrees Celsius	120.1	1000	1000	100	90-110

Client: Earthlon Service Request #: 51302840  
 Project: IP Roanoke Rapids  
 Cooler received on 5/22/13 and opened on 5/22/13 by SL  
 COURIER: ALS UPS FEDEX Client Other \_\_\_\_\_ Airbill # 8025 3993 4814

- 1 Were custody seals on outside of cooler?  Yes No
- If yes, how many and where? #: 1 on lid other \_\_\_\_\_
- 2 Were seals intact and signature and date correct?  Yes No N/A
- 3 Were custody papers properly filled out?  Yes No N/A
- 4 Temperature of cooler(s) upon receipt (Should be > 0°C and < 6°C) 2.6"
- 5 Thermometer ID 781
- 6 Temperature Blank Present?  Yes No
- 7 Were Ice or Ice Packs present?  Ice Ice Packs No
- 8 Did all bottles arrive in good condition (unbroken, etc....)? Yes  No N/A
- 9 Type of packing material present Netting Vial Holder Bubble Wrap  
Paper Styrofoam Other N/A
- 10 Were all bottle labels complete (sample ID, preservation, etc....)?  Yes No N/A
- 11 Did all bottle labels and tags agree with custody papers?  Yes No N/A
- 12 Were the correct bottles used for the tests indicated?  Yes No N/A
- 13 Were all of the preserved bottles received with the appropriate preservative? Yes  No N/A  
HNO3 pH<2 H2SO4 pH<2 ZnAc2/NaOH pH>9 NaOH pH>12 HCl pH<2  
Preservative additions noted below
- 14 Were all samples received within analysis holding times?  Yes No N/A
- 15 Were all VOA vials free of air bubbles? If present, note below Yes No N/A
- 16 Where did the bottles originate? ALS Client

Sample ID	Reagent	Lot #	ml added	Initials Date/Time
<u>mw-6</u>	<u>HNO3</u>	<u>MC1-15-78E</u>	<u>3.0</u>	<u>SL 5/22/13 10:45</u>
<u>DUP-1</u>	↓	↓	<u>3.0</u>	↓
<u>mw-3</u>	↓	↓	<u>1.0</u>	↓
<u>mw-7</u>	↓	↓	<u>2.0</u>	↓

Additional comments and/or explanation of all discrepancies noted above:  
one vial for mw-3 arrived with broken lid

Client approval to run samples if discrepancies noted: \_\_\_\_\_ Date: \_\_\_\_\_



# CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

9143 Philips Highway, Ste 200 • Jacksonville, FL 32256 (904) 739-2277 • 800-695-7222 x06 • FAX (904) 739-2011

PAGE 1 OF 1

SR# **J1302840**  
CAS Contract

Project Name <b>J.P. Renselke Rapids</b>		Project Number						
Project Manager <b>Pat Reilly</b>		Email Address <b>PRELLEY@EARTHCON.COM</b>						
Company/Address <b>EarthCon Consulting, Inc.</b>		Company/Address <b>EarthCon Site Services Inc</b>						
<b>1880 West Oak Branch, Bld 100, STE 106</b>		<b>IP Roanoke Rapids</b>						
Phone # <b>MARIETTA, GA 30062</b>		FAX # <b>770-973-7395</b>						
Sample's Signature <i>[Signature]</i>		Sample's Printed Name <b>KENT M. DAVIS</b>						
CLIENT SAMPLE ID	LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	PRESERVATIVE	ANALYSIS REQUESTED (Include Method Number and Container Preservative)	
<b>MW-6</b>		<b>5/21/13</b>	<b>0915</b>	<b>GW</b>	<b>5</b>	<b>2</b>	<b>J1302840</b>	
<b>Dup-1</b>				<b>GW</b>	<b>1</b>	<b>1</b>	<b>EarthCon Site Services Inc</b>	
<b>MW-5</b>		<b>11/5</b>		<b>GW</b>	<b>6</b>	<b>1</b>	<b>IP Roanoke Rapids</b>	
<b>MW-3</b>		<b>12/30</b>		<b>GW</b>	<b>6</b>	<b>1</b>	<b>5</b>	
<b>MW-7</b>		<b>11/5</b>		<b>GW</b>	<b>6</b>	<b>1</b>	<b>EarthCon Site Services Inc</b>	
<b>MW-1</b>		<b>12/30</b>		<b>GW</b>	<b>6</b>	<b>1</b>	<b>IP Roanoke Rapids</b>	
SPECIAL INSTRUCTIONS/COMMENTS <b>All wells are LG - rusted off MW - 40 ml total for Dup - Ld broke</b>		TURNAROUND REQUIREMENTS <input checked="" type="checkbox"/> RUSH (SURCHARGES APPLY) <input type="checkbox"/> STANDARD		REPORT REQUIREMENTS I. Results Only II. Results + QC Summaries (LCS, DUP, MS/MSD as required) III. Results + QC and Calibration Summaries IV. Data Validation Report with Raw Data V. Specialized Forms / Custom Report		INVOICE INFORMATION PO # BILL TO:		
RECEIVED BY <i>[Signature]</i> Printed Name <b>Kent M. Davis</b> Firm <b>EarthCon</b> Date/Time <b>5/22/13 1700</b>		RECEIVED BY <i>[Signature]</i> Printed Name <b>Kent M. Davis</b> Firm <b>EarthCon</b> Date/Time <b>5/22/13 0906</b>		RECEIVED BY <i>[Signature]</i> Printed Name <b>Kent M. Davis</b> Firm <b>EarthCon</b> Date/Time <b>5/22/13 0906</b>		RECEIVED BY <i>[Signature]</i> Printed Name <b>Kent M. Davis</b> Firm <b>EarthCon</b> Date/Time <b>5/22/13 0906</b>		



ALS Environmental Services  
9143 Philips Highway, Suite 200  
Jacksonville, FL 32256  
Tel 904-739-2277  
Fax 904-739-2011

# **Appendix A**

## **Subcontracted Analytical Results**



**Summit**  
ENVIRONMENTAL TECHNOLOGIES, INC  
*Analytical Laboratories*

*Summit Environmental Technologies, Inc.*  
3310 Win St.  
Cuyahoga Falls, Ohio 44223  
TEL: (330) 253-8211 FAX: (330) 253-4489  
Website: <http://www.settek.com>

June 03, 2013

Jerry Allen  
ALS Environmental, Inc.  
9143 Philips HWY  
Jacksonville, FL 32256  
TEL: (904) 739-3277  
FAX: (904) 739-2011

RE: J1302840

Order No.: 13050754

Dear Jerry Allen:

Summit Environmental Technologies, Inc. received 6 sample(s) on 5/24/2013 for the analyses presented in the following report.

There were no problems with the analytical events associated with this report unless noted in the Case Narrative. Analytical results designated with a "J" qualifier are estimated and represent a detection above the Limit of Detection (LOD) and less than the Method Detection Limit (MDL). These analytes are not reviewed nor narrated as to whether they are laboratory artifacts.

Quality control data is within laboratory defined or method specified acceptance limits except where noted.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Dr. Mo Osman  
Project Manager  
3310 Win St.  
Cuyahoga Falls, Ohio 44223

A2LA 0724.01, Alabama 41600, Arkansas 88-0735, California 07256CA, Colorado, Connecticut PH-0105, Delaware, Florida NELAC E87688, Georgia E87688 and 943, Idaho OH00923, Illinois 200061 and Reg.5, Indiana C-OH-13, Kansas E-10347, Kentucky (underground Storage Tank) 3, Kentucky 90146, Louisiana 04061 and LA12004, Maine 2012015, Maryland 339, Massachusetts M-OPH923, Minnesota 409711, Montana CERT0099, New Hampshire 2996, New Jersey OH006, New York 11777, North Carolina 39705 and 631, Ohio 4170, Ohio VAP CL0052, Oklahoma 9940, Oregon OH200001, Pennsylvania 68-01335, Rhode Island LA000317, South Carolina 92016001, Tennessee TN04018, Texas T104704466-11-5, Region 8 8TMS-L, USDA/APHIS P330-11-00244, Utah OH009232011-1, Vermont VT-87688, Virginia 00440 and 1581, Washington C891, West Virginia 248 and 9957C and E87688, Wisconsin 399013010



**SUMMIT**  
ENVIRONMENTAL TECHNOLOGIES, INC.  
Analytical Laboratories

Summit Environmental Technologies, Inc.  
3310 Win St.  
Cuyahoga Falls, Ohio 44223  
TEL: (330) 253-8211 FAX: (330) 253-4489  
Website: <http://www.settek.com>

## Workorder Sample Summary

WO#: 13050754  
03-Jun-13

CLIENT: ALS Environmental, Inc.  
Project: J1302840

Lab SampleID	Client Sample ID	Tag No	Date Collected	Date Received	Matrix
13050754-001	J1302840-001		5/21/2013 9:15:00 AM	5/24/2013 11:00:00 AM	Non-Potable Water
13050754-002	J1302840-002		5/21/2013	5/24/2013 11:00:00 AM	Non-Potable Water
13050754-003	J1302840-003		5/21/2013 11:15:00 AM	5/24/2013 11:00:00 AM	Non-Potable Water
13050754-004	J1302840-004		5/21/2013 12:30:00 PM	5/24/2013 11:00:00 AM	Non-Potable Water
13050754-005	J1302840-005		5/21/2013 2:45:00 PM	5/24/2013 11:00:00 AM	Non-Potable Water
13050754-006	J1302840-006		5/21/2013 3:40:00 PM	5/24/2013 11:00:00 AM	Non-Potable Water



**SUMMIT**  
ENVIRONMENTAL TECHNOLOGIES, INC  
*Analytical Laboratories*

*Summit Environmental Technologies, Inc.*  
3310 Win St.  
Cuyahoga Falls, Ohio 44223  
TEL: (330) 253-8211 FAX: (330) 253-4489  
Website: <http://www.settek.com>

## Case Narrative

WO#: 13050754  
Date: 6/3/2013

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**CLIENT:** ALS Environmental, Inc.  
**Project:** J1302840

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This report in its entirety consists of the documents listed below. All documents contain the Summit Environmental Technologies, Inc. Work Order Number assigned to this report.

Paginated Report including: Cover Letter, Case Narrative, Analytical Results, Applicable Quality Control Summary Reports and copies of the Chain of Custody Documents supplied with this sample set.

Concentrations reported with a J flag in the Qual field are values below the Limit of Quantitation (LOQ) but greater than the established Limit of Detection (LOD). There is greater uncertainty associated with these results and data should be considered as estimated.

Concentrations reported with an E flag in the Qual field are values that exceed the upper quantification range. There is greater uncertainty associated with these results and data should be considered as estimated.

Any comments or problems with the analytical events associated with this report are noted below.

---

Original

# Memorandum

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Date: June 11, 2013  
To: Stephanie Saia, EarthCon Consultants  
From: Kathy J. Gunderson, Senior Quality Assurance Chemist  
Subject: Quality Assurance Review  
Project: International Paper - Roanoke Rapids, NC - Low Ground Landfill  
Sampling Date: May 21, 2013  
Project Number: 25.20090383.13

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## 1.0 Introduction

This memorandum presents the cursory validation of the water sample analyses listed in Table 1. The analyses were performed by Columbia Analytical Services, Inc. with the exception of the total organic halide (TOC) analyses that were subcontracted to Summit Environmental Technologies, Inc. The criteria used to qualify data are from the *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (USEPA 2004), the analytical methods, or the professional judgment of the validation chemist. The following laboratory deliverables were reviewed during the validation process:

- Chain-of-custody (COC) documentation to assess holding times and verify report completeness
- Laboratory quality control (QC) sample results, including method blanks, laboratory control samples (LCSs), matrix spike/matrix spike duplicates (MS/MSDs), and laboratory duplicates
- Analytical results to verify reporting limits

**Table 1—Sample Data Reviewed**

Sample ID	Laboratory ID	Metals <sup>a</sup>	Wet Chem <sup>b</sup>
MW-6	J1302840-001	X	X
Dup-1	J1302840-002	X	X
MW-5	J1302840-003	X	X
MW-3	J1302840-004	X	X
MW-7	J1302840-005	X	X
MW-1	J1302840-006	X	X

<sup>a</sup> Total metals by methods 6010B, 6020, and 7470A (USPEPA 1996)

<sup>b</sup> BOD by method 405.1, TOC by method 415.1, COD by method 5220D, pH by method 9040B, conductivity by method 120.1, TDS by 160.1, TOX by method 9020 and nitrate, sulfate, fluoride and chloride by method 300.0 (SM 1992, USEPA 1983, USEPA 1996, and USEPA 1999b)

## **2.0 Data Validation Findings**

### **2.1 Custody, Preservation, and Completeness**

Sample custody was maintained from sample collection to receipt at the laboratory. The report is complete and contains results for the samples and tests requested on the COC form. The samples were received intact and were properly preserved.

- The COC did not list pH analysis. The samples were analyzed for pH as required.
- The preservation pH of the metals aliquots of samples MW-3, MW-6, MW-7, and Dup-1 was not less than 2 as required. The sample aliquots were acidified prior to analysis. Data qualifiers are not required.

### **2.2 Metals Analyses**

The samples noted on Table 1 were analyzed for total metals by methods 6010B, 6020 and 7470A.

#### **2.2.1 Holding Times**

The samples were analyzed within the method-required holding times.

#### **2.2.2 Blank Analyses**

##### **2.2.2.1 Method Blanks**

Method blanks were analyzed at the required frequency. With one exception, target metals were not detected at concentrations above the method detection limits in the method blank samples.

- Total iron was detected in the method blank at 6 µg/L. Functional Guidelines 2004 prescribes two qualifications schemes for blank contamination: (1) associated sample concentrations greater than the action level (ten times the blank concentration ) are not qualified, and (2) associated sample concentrations less than the action level are qualified as undetected (U) at the reported value. Only sample MW-7 required qualification as shown in Section 5.0.

##### **2.2.2.2 Field Blanks**

Field blank samples were not collected. Data qualification is not required.

#### **2.2.3 Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses**

MS/MSDs were analyzed as required. The recovery and RPD values for the MS/MSD analyses are within the laboratory QC limits.

#### 2.2.4 Laboratory Control Sample Analyses

LCS samples were analyzed as required. The recovery values are within the laboratory QC limits.

#### 2.2.5 Laboratory Reporting Limits

The reporting limits are consistent with method reporting limits (MRL) with the exception of samples requiring analysis at a dilution.

#### 2.2.6 Field Duplicates

One field duplicate pair (MW-6/ DUP-1) was collected with these samples. The field duplicate results are consistent with the sample results. The RPDs for the detected analytes are provided in the table below.

Parameter	Units	MW-6 Sample Result	Dup-1 Duplicate Result	RPD
Total Barium	ug/L	448	446	0.4
Total Chromium	ug/L	3.2	3.6	12
Total Copper	ug/L	0.8	0.9	12
Total Iron	ug/L	130	120	8.0
Total Manganese	ug/L	1320	1330	0.8

#### 2.2.7 Overall Assessment of Data Usability

The usability of the data is based on the EPA guidance documents noted previously. Based upon the information presented here, the data are acceptable with qualification.

### 2.3 General Chemistry Analyses

The samples were analyzed for biochemical oxygen demand (BOD), total organic carbon (TOC), chemical oxygen demand (COD), pH, conductivity, total dissolved solids (TDS), nitrate, fluoride, sulfate, chloride, and total organic halides (TOX).

#### 2.3.1 Holding Times

The samples were analyzed within the method-required holding times with the following exception.

- The pH analyses were performed beyond the holding time of ASAP (usually interpreted as less than 15 minutes). The pH results for each sample are qualified as estimated (J).

#### 2.3.2 Blank Analyses

##### 2.3.2.1 Method Blanks

Method blanks were analyzed at the required frequency. Target constituents were not detected in the method blanks, with one exception.

- TOC was detected in the method blank at a concentration of 0.09 mg/L. Data qualifiers are not required because the TOC concentrations in the field samples are greater than ten times the method blank concentration.

#### **2.3.2.2 Field Blanks**

Field blank samples were not collected. Data qualification is not required.

#### **2.3.3 Matrix Spike Analyses**

Matrix spikes were reported for TOX. The MS recovery values are within the laboratory QC limits.

- Matrix spike analyses were not report for COD, TOC, chloride, sulfate, nitrate, or fluoride. It is Test America's policy not to report the results of QC analyses performed on non-project samples. Data qualifiers are not required based on a lack of laboratory QC samples. Note that the LCS results are acceptable, demonstrating the analytical system is in-control.

#### **2.3.4 Matrix Duplicate Analyses**

Matrix duplicates (MD) were analyzed as required for conductivity and TOX. The RPD values are within the laboratory QC limits.

- Matrix duplicates were not report for pH, COD, TOC, chloride, sulfate, nitrate, or fluoride. It is Test America's policy not to report the results of QC analyses performed on non-project samples. Data qualifiers are not required based on a lack of laboratory QC results. Note that the field duplicate results are acceptable, demonstrating acceptable analytical system precesion.

#### **2.3.5 Laboratory Control Sample Analyses**

LCSs were analyzed as required. The recovery values are within the laboratory QC limits.

#### **2.3.6 Laboratory Reporting Limits**

The reporting limits are consistent with method reporting limits.

#### **2.3.7 Field Duplicates Analyses**

One field duplicate pair (MW-6/DUP-1) was collected with these samples. The field duplicate results are consistent with the sample results. The RPDs for the detected analytes are provided in the table below.

Parameter	Units	MW-6 Sample Result	Dup-1 Duplicate Result	RPD
Biochemical oxygen demand	mg/L	2.9	4.1	34
Total organic carbon	mg/L	17.6	17.5	0.6
Chemical oxygen demand	mg/L	55	55	0
Chloride	mg/L	23.6	23.1	2.1
Conductivity	umhos/cm	2960	2950	0.3
Fluoride	mg/L	0.30	0.30	0
pH	S.U.	7.35	7.28	0.9
Total dissolved solids	mg/L	2070	1990	3.9
Sulfate	mg/L	75.4	74.2	1.6

### 2.3.8 Overall Assessment of Data Usability

The usability of the data is based on the EPA guidance documents noted previously. Based upon the information presented here, the data are acceptable with qualification.

### 3.0 Data Qualifier Definitions

The following data validation qualifiers were used in the review of this data set. These qualifiers are from the *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (USEPA 1999).

- U The analyte was analyzed for but not detected above the reported sample quantitation limit.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a “tentative identification”.
- NJ The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents its approximate concentration.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the samples and meet quality control criteria. The presence or absence of the analyte cannot be verified.

## 4.0 References

- SM 1992. Standard Methods for the Examination of Water and Waste, 18<sup>th</sup> Edition. 1992.
- USEPA. 1983. Methods for Chemical Analysis of Water and Waste EPA/600/4-79/020. United States Environmental Protection Agency. Office of Research and Development. March 1983.
- USEPA. 1996. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846) Third Edition, Updates I, II, IIA, IIB, and III. United States Environmental Protection Agency. Office of Solid Waste. December 1996.
- USEPA. 1999a. Contract Laboratory Program National Functional Guidelines for Organic Data Review. U.S. Environmental Protection Agency Office of Emergency and Remedial Response. EPA540/R-99/008. October 1999.
- USEPA. 1999b. Method 1664, Revision A: N-Hexane Extractable Material (HEM; Oil and Grease) and Silica Gel Treated N-Hexane Extractable Material by Extraction and Gravimetry EPA-821-R-98-002. United States Environmental Protection Agency. Office of Water. February 1999.
- USEPA. 2004. Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. U.S. Environmental Protection Agency Office of Superfund Remediation and Technology Innovation. EPA 540-R-04-004. October 2004.

## 5.0 Summary of Qualified Data

The following sample results were qualified during the review of this data set.

Sample ID	Analyte	Qualifier	Reason for Qualification
MW-6	pH	J	Analyzed beyond the holding time
MW-5	pH	J	Analyzed beyond the holding time
MW-3	pH	J	Analyzed beyond the holding time
MW-7	pH	J	Analyzed beyond the holding time
MW-1	pH	J	Analyzed beyond the holding time
DUP-1	pH	J	Analyzed beyond the holding time
MW-7	Total iron	U	Result less than 10X the method blank concentration