December 24, 2014
File No. 21.0056546.00

Mr. Glenn May
NYSDEC Region 9
270 Michigan Avenue
Buffalo, New York 14203

535 Washington Street
11th Floor
Buffalo, New York
14203
716-685-2300
FAX 716-685-3629
http://www.gza.com

Re: Results of May 2014 Monitored Natural Attenuation Groundwater Sampling
Delphi Harrison Thermal Systems Site (Site)
Lockport, New York
Registry Site No. 932113

Dear Mr. May:

GZA GeoEnvironmental of New York (GZA) presents this letter report to summarize results of the May 2014 groundwater and monitored natural attenuation (MNA) parameter sampling event at the above-referenced Site. The groundwater sampling event conducted from May 13 through May 30 included eight monitoring wells (MW-4, -7, -10, -11, -12, -13, -14 and -15) that were sampled for the five compounds of concern (COCs)[1] and MNA parameters as identified in the Site Management Plan[2] (SMP). In addition to the MNA parameters identified in the SMP, carbon dioxide, hydrogen, ethene, and ethane were added to the sampling parameter list for 2014. These parameters are consistent with the 2011 through 2013 sampling events with the exception of the analysis of sodium (Na), calcium (Ca), potassium (K) and volatile fatty acids (VFAs) which were not included in the 2014 analyses as these parameters provide limited benefit in the further evaluation of MNA at this site.

GZA also performed a treatability study to evaluate whether the addition of an organic carbon amendment might re-stimulate natural attenuation by reductive dechlorination.

BACKGROUND

In March 2005, NYSDEC issued a Record of Decision (ROD) for the Site, which selected MNA as the remedial alternative to address the COCs present at the Site. Annual MNA groundwater sampling was completed voluntarily from October 2006 to May 2011. In November 2011, GM Components Holdings, LLC (GMCH) entered into an Order on Consent and Administrative Settlement, discussed later in this section, which requires that annual sampling be conducted as part of the SMP.

---

[1] The five COCs are trichloroethylene, tetrachloroethylene, *cis*-1,2-dichloroethene, *trans*-1,2-dichloroethylene, and vinyl chloride.

[2] "Delphi Harrison Thermal Systems Site, Niagara County, New York, Site Management Plan, NYSDEC Site Number 9-32-113" dated October, 2011. Prepared for GM Components Holdings, LLC by GZA.

Six monitoring wells (MW-7, MW-11, MW-12, MW-13, MW-14 and MW-15) were monitored in October 2006, November 2007 and November 2008 (see Figure 1 for locations). MW-7 is located in the vicinity of the Area of Concern (AOC) and the other five wells, MW-11 through MW-15, are downgradient monitoring locations.

Based on the results of the groundwater sampling program through March 2009, the sampling program was expanded in July 2009 to include 10 monitoring well locations: MW-4, -7, -8, -9, -10, -11, -12, -13, -14 and -15.

The next groundwater sampling event, completed in April 2010, indicated that natural attenuation is occurring with limited evidence of reductive dechlorination near the source area (MW-7) and midpoint (MW-4 and -10) of the groundwater plume. However, there was adequate to strong evidence for anaerobic biodegradation of COCs at the leading edge of the groundwater plume (MW-11 through -15). Given these conditions, coupled with the lack of evidence of an expanding plume, it appeared that natural attenuation processes were effectively managing the COC plume migration.

Results of the April 2011 sampling round were similar to the April 2010 results *i.e.*, natural attenuation of COCs was apparently occurring. However, there appeared to be a decreasing total organic carbon (TOC) concentration trend across the Site indicating that the "fuel" that drives reductive dechlorination may becoming depleted. GZA recommended continuing the annual groundwater sampling event utilizing eight monitoring wells (MW-4, -7, -10, -11, -12, -13, -14 and -15), as stated in the SMP, in the Spring of 2012 and expanding the analyte list to include the following:

- Carbon dioxide;
- Alkalinity;
- Hydrogen;
- Volatile Fatty Acids (VFAs); and
- Ethene/Ethane.

In November 2011, GMCH entered into an Order on Consent and Administrative Settlement (Index #B9-0553-99-06) for the Site. The Final Engineering Report for the Site was submitted in March 2012 and a Certificate of Completion was issued by NYSDEC dated March 13, 2012. The Certificate of Completion required the following be completed:

- A record of notice for the Certificate of Completion must be filed with Niagara County within 30 days of issuance of the Certificate of Completion. The record of notice was recorded on April 10, 2012.
- A fact sheet must be issued describing the institutional and engineering controls that are required at the Site. The fact sheet was distributed by NYSDEC to their Listserv contact list in April 2012.
- The NYSDEC-approved SMP must be implemented.

The April 2012 groundwater sampling and natural attenuation parameter monitoring event was completed in accordance with the SMP.

The report of the April 2012 results indicated that natural attenuation of COCs is occurring via reductive dechlorination, and offered the following observations:

- The COC concentrations of the parent compounds were decreasing from the source area (MW-7) downgradient to the mid-point of the plume (MW-4 and MW-10) and on to the downgradient portions of the Site (MW-11 through MW-15).
- There was an increase in daughter compounds concentrations from the source area to the mid-point of the plume, with an overall decrease in total COC concentrations.
- The COC concentrations at the downgradient property line did not exceed the NYSDEC Class GA criteria.

There appears to be a temporal decreasing trend in TOC concentrations. TOC represents a surrogate measurement of the "fuel" that drives reductive dechlorination.

GZA recommended continuing the annual groundwater sampling event utilizing eight monitoring wells (MW-4, -7, -10, -11, -12, -13, -14 and -15), as stated in the SMP, in the Spring of 2013, and utilize the natural attenuation analytical parameter list used during the 2012 testing in the 2013 sample round.

The May 2013 groundwater sampling and natural attenuation parameter monitoring event was completed in accordance with the SMP.

Like the 2012 report, the report of the May 2013 results indicated that natural attenuation of COCs is occurring via reductive dechlorination, and offered the following observations:

- The COC concentrations of the parent compounds are decreasing from the source area (MW-7) downgradient to the mid-point of the plume (MW-4 and MW-10), and from the mid-point and on to the downgradient portions of the Site (MW-11 through MW-13).
- There was an increase in daughter compound concentrations from the source area to the mid-point of the plume, with an overall decrease in total COC concentrations.
- The COC concentrations at the downgradient property line do not exceed the NYSDEC Class GA criteria.

Also, the 2013 data indicated that ethene was detected in groundwater samples collected from all eight monitoring wells. Assuming the ethene represents the ultimate daughter product of cVOC reductive dechlorination, its detection at each monitoring well was a direct line of evidence that cVOCs have been degraded to completion at the Site.

The temporal decreasing trend in TOC concentrations continued through the 2013 monitoring event. GZA recommended a treatability study to evaluate whether the addition of an organic carbon amendment might re-stimulate natural attenuation by reductive dechlorination. The recommended study involved deployment of *in-situ* microcosms (Bio-Trap® ISMs, manufactured by Microbial Insights, Inc. of Knoxville, Tennessee) "baited" with an organic carbon additive to evaluate whether reductive dechlorination can be re-stimulated.

GZA also recommended continuing the annual groundwater sampling event utilizing eight monitoring wells (MW-4, -7, -10, -11, -12, -13, -14 and -15), as stated in the SMP, in the Spring of 2014.

MAY 2014 GROUNDWATER MONITORING & SAMPLING

The May 2014 groundwater monitoring and sampling event was conducted from May 13 through May 30, 2014 in accordance with the SMP and included eight monitoring wells (MW-4, MW-7, and MW-10 through MW-15, see Figure 1).

Methodology

The groundwater monitoring and sampling was performed using low flow sampling techniques with a peristaltic pump, disposable polyethylene tubing and a water quality meter with a flow-through cell to collect water quality field parameters. The sampling technique and analytical parameters were consistent with the SMP.

The following is the list of the analytical parameters for this sampling event:

Field Measured Parameters: temperature, specific conductance, pH, turbidity, dissolved oxygen (DO) and oxidation reduction potential (ORP).

Compounds of Concerns: tetrachloroethylene (PCE), trichloroethylene (TCE), *cis*-1,2-dichloroethylene (*cis*-DCE), *trans*-1,2-dichloroethylene (*trans*-DCE) and vinyl chloride (VC).

Natural Attenuation Parameters: methane, iron, magnesium, manganese, alkalinity, TOC, chloride, nitrate, nitrite, sulfate, sulfide, carbon dioxide, hydrogen, ethene, and ethane.

Groundwater pumping rates varied from one well to another during monitoring/sampling in order to establish a relatively stable water level. Once a stable water level was established within the monitoring well, flow rates were maintained during the monitoring/sampling period. Samples were collected for analysis after field-measured parameters stabilized, and a minimum of one well volume was purged. It should be

noted that a stable water level could not be established at well MW-7 (similar to previous rounds). Therefore, this location was purged to dry-like conditions and allowed to recharge until the recharge volume was sufficient to collect the sample parameters. Also, due to the lack of a stable water level, the hydrogen sample could not be collected. The Monitoring Well Observations & Groundwater Sampling Logs are included in Appendix A.

ANALYTICAL RESULTS & DISCUSSION

Analytical results for the COCs for the current sampling event along with the data from previous sample rounds are shown on Figure 1. A contour map of the Total COC concentrations is presented on Figure 2 and a groundwater elevation contour map of the groundwater elevation data collected is shown on Figure 3. It should be noted that the concentrations of *cis*-DCE and *trans*-DCE have been combined for presentation purposes as total 1,2-DCE in Figure 1, although the bulk of total 1,2-DCE mass includes the *cis* isomer. The analytical results for the COCs (current and historic) shown on Figure 1 have been graphically depicted and are included in Appendix B.

Analytical results for the MNA parameters are shown on Table 1, along with the data from previous sample rounds. The TestAmerica Laboratories, Inc. laboratory report is provided in Attachment A.

Compounds of Concern

Source Area Monitoring Well

MW-7: The TCE concentrations over time at MW-7 have generally been in the range of 500 to 800 mg/L from October 1996 through May 2014 with the exception of four contiguous sample rounds from April 2003 through November 2008, where the results ranged from 1.1 to 430 ppm. The TCE concentration graph in Appendix B indicates a downward temporal trend in concentrations from April 1996 to April of 2003, which is consistent with natural attenuation. The TCE concentrations from November 2008 to May 2014 fluctuated with a near order of magnitude upward trend that may be attributed to the decrease in TOC concentrations. The TCE concentrations from May 2013 to May 2014 have not shown any change in magnitude, indicating that the rebound in concentration may be nearing its maximum level.

The concentrations of the PCE, 1,2-DCE and VC appear to generally be consistent since the start of the sampling in 1996, with some minor fluctuation.

Mid Plume Monitoring Wells

MW-4: The concentrations of the TCE, PCE, and VC appear to generally be consistent since the start of the sampling in 1996, with some minor fluctuations.

Since 2003, there has been a consistent downward temporal trend of 1,2-DCE concentrations at MW-4, which may reflect the decreasing TOC concentration temporal trend that would drive the microbially-mediated transformation of TCE→*cis*1,2-DCE.

MW-10: There is a downward temporal trend of TCE and 1,2-DCE concentrations at MW-10 since 1996, which is consistent with natural attenuation with some minor fluctuations. VC and PCE concentrations have been generally lower since 1999, also consistent with natural attenuation, with some fluctuation.

Downgradient Monitoring Wells

MW-11: The detected concentrations of PCE and TCE have been below method detection limits since the start of sampling in 1997, generally consistent with natural attenuation at this downgradient location.

The concentrations of 1,2-DCE have fluctuated from below method detection limits (multiple sample rounds) to 0.013 ppm (December 1998) with the majority of the detected concentrations (14 of 16 sample rounds) being below the NYSDEC Class GA criteria (0.005 ppm), including the 2014 sampling event.

The concentrations of VC have fluctuated from below method detection limits (multiple sample rounds) to 0.008 ppm (August 2001) in a temporal pattern generally similar to the 1,2-DCE. Results from the last several sample rounds have been at or below the NYSDEC Class GA criteria (0.002 ppm), including the 2014 sampling event, which was below the method detection limit (<0.0009 ppm).

MW-12: PCE and TCE were not detected above their respective Class GA criteria (0.005 ppm) from 2009 to 2013. TCE (0.0074 ppm) has been detected slightly above the NYSDEC Class GA criteria during this sampling event. PCE (0.002 ppm) was also detected during this sampling event, but below the NYSDEC Class GA criteria. The rise in contaminant concentration may be related to sewer line excavations completed in the area since the 2013 sampling event, which may have provided a temporary preferential pathway for the compounds to travel.

The concentrations of 1,2-DCE have fluctuated from 0.011 ppm (November 2007) to 0.272 ppm (April 2010). The 1,2-DCE concentration for the 2014

sampling event was 0.13 ppm, which is above the average 1,2-DCE concentration detected at this location to date.

The concentrations of VC have fluctuated from 0.011 ppm (October 2001) to 0.190 ppm (August 1997). The VC concentration for the 2014 sampling event was 0.044 ppm, which is below the average VC concentration detected at this location.

MW-13: The detected concentrations of PCE, TCE, 1,2-DCE and VC have been below method detection limits in all but one sample round (October 2006) since the start of sampling in 2001. The results for 2014 were below method detection limits.

MW-14: The detected concentrations of TCE have been below method detection limits in 10 of the 12 sample rounds conducted since the start of sampling in 2001. The results for 2014 were below method detection limits.

The detected concentrations of PCE have all been below method detection limits since the start of sampling in 2001.

The detected concentrations of 1,2-DCE have been below method detection limits or below its respective NYSDEC Class GA criteria in nine of the 12 sample rounds conducted since the start of sampling in 2001. The concentration of 1,2-DCE during the 2014 sampling round was below method detection limit.

The detected concentrations of VC have been below method detection limits in 10 of the 12 sample rounds conducted since the start of sampling in 2001. The one round where VC (0.003 ppm) did slightly exceed its respective NYSDEC Class GA criteria was in November 2008. The concentration of VC for this round was below the method detection limit.

MW-15: The detected concentrations of TCE were below method detection limits (<0.002 ppm) in the first six of the 12 sample rounds conducted since the start of sampling in 2001. TCE has been detected in the most recent five rounds at concentrations above the method detection limits (0.00064 to 0.0007 ppm), but below the NYSDEC Class GA criterion.

The detected concentrations of PCE have been above its NYSDEC Class GA criteria in the 11 sample rounds conducted since the start of sampling in 2001, ranging from 0.02 ppm (October 2001) to 0.0059 ppm (November 2008). There was a decrease in PCE concentrations in 2001, followed by asymptotic concentrations between approximately 0.005 and 0.01 mg/L thereafter. The detected concentration of PCE in the 2014 sample round was 0.0064, which is slightly above the NYSDEC Class GA criterion.

The detected concentrations of 1,2-DCE and VC have been below their method detection limits in the 11 sampling rounds conducted since the start of sampling in 2001.

Natural Attenuation Performance

Findings of the May 2014 groundwater analytical and water quality data are generally consistent with the substantive conclusions and trends noted in prior reports. During 2014, GZA used Wiedemeier *et. al.'s* (1998[3]) approach to evaluate the performance data to re-assess the strength of the evidence supporting reductive dechlorination. Tables summarizing the results of that evaluation are included in Appendix C, and the results are tabulated below.

WELL	STRENGTH OF NATURAL ATTENUATION EVIDENCE			
	INADEQUATE EVIDENCE	**LIMITED EVIDENCE**	**ADEQUATE EVIDENCE**	**STRONG EVIDENCE**
Source Area Well				
MW-7		X		
Mid Plume Wells				
MW-4			X	
MW-10		X		
Downgradient Wells				
MW-11		X		
MW-12		X		
MW-13		X		
MW-14		X		
MW-15		X		

Note: "X" indicates the respective strength of the evidence for natural attenuation by reductive dechlorination for the May 2014 groundwater monitoring round in accordance with Wiedemeier *et. al.*. (1998).

As summarized above in the embedded table, there is no strong evidence for natural attenuation by reductive dechlorination at any of the monitoring wells currently sampled annually for performance monitoring. There is adequate evidence for natural attenuation by reductive dechlorination at well MW-4 and limited evidence in the remaining seven wells. A decreasing TOC temporal trend may be limiting the effectiveness of natural attenuation by reductive dechlorination for managing cVOC migration at the Site.

TREATABILITY STUDY

GZA performed a treatability study to evaluate whether the addition of an organic carbon amendment might re-stimulate natural attenuation by reductive dechlorination. The study involved deployment of Bio-Trap® In-Situ Microcosms (ISMs, manufactured by Microbial Insights, Inc. of Knoxville, Tennessee) "baited" with an organic carbon additive. The organic carbon amendment serves as an electron donor, stimulating native microbes to scavenge electron acceptors that compete with cVOCs (dissolved oxygen, nitrate, and

[3] Wiedemeier, T.H., Swanson, M.A., Moutoux, D.E., Gordon, E.K., Wilson, J.T., Wilson, B.H., Kampbell, D.H., Haas, P.E., Miller, R.N., Hansen, J.E., and Chapelle, F.H., 1998, Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water, EPA/600/R-98/128, 78 p.

sulfate, and oxidized forms of iron and manganese). As the organic carbon is degraded, it also serves as a source of hydrogen. Hydrogen is the electron donor used by dechlorinating microbes to promote the transformation of cVOCs (electron acceptors) to dechlorinated end products, e.g., ethene, ethane, and ultimately carbon dioxide and water.

Bio-Trap Deployment

The Bio-Trap In-Situ Microcosm (ISM) study was performed at two monitoring well locations, MW-7 and MW-4. MW-7 is located near the contaminant source area of the Delphi Site and MW-4 is representative of mid-plume conditions, approximately 350 feet east and downgradient of MW-7. The treatability study was designed to investigate whether an organic carbon/nutrient additive could re-stimulate biodegradation of cVOCs. The ISM assemblies deployed in the two wells consisted of two units each, denoted as "MNA" and "BioStim." The MNA units contained no exogenous amendment, simulating natural attenuation conditions. The BioStim units contained a lactose sugar/yeast/vitamin blend as a source of organic carbon electron donor and microbial nutrients. An ISM assembly (containing an "MNA" unit and a "BioStim" unit) was deployed on June 5, 2014 at each monitoring well location. The two traps were suspended in series and lowered into the monitoring well with a nylon cord. The ISMs were suspended near the midpoint of the respective well screens. The ISM assemblies were recovered after a 91-day incubation period and sent to Microbial Insights for analytical testing following typical chain-of-custody protocols.

Testing included qPCR (Quantitative Polymerase Chain Reaction) analysis of dechlorinating bacteria and enzyme markers (CENSUS®), and quantification of cVOCs, dissolved gases, volatile fatty acids (VFAs), and anions (nitrate, nitrite, ortho-phosphate, sulfate, and chloride).

Analytical Results & Discussion

The Bio-Trap ISMs were analyzed for the following parameters:

VOC contaminants of concern (EPA Method 8260):
Trichloroethene, tetrachloroethene, cis-1,2-dichloroethene, vinyl chloride
MNA Parameters
Anions (Ion Chromatography):
Nitrate, Nitrite, Ortho Phosphate, Sulfate, Chloride
Dissolved Gases (AM20GAX):
Ethane, Ethene, and Methane
Volatile Fatty Acids (AM21G):
Lactic, Acetic Propionic, Butyric, Pyruvic
CENSUS (Quantitative Polymerase Chain Reaction, qPCR):
Dehalococcoides (DHC), trichloroethene reductase tceA), vinyl chloride reductase (bvcA and vcrA)

The CENSUS analysis is a molecular biological tool using qPCR to detect and quantify specific microorganisms or functional genes deemed critical for successful bioremediation. The data obtained for the Bio-Trap ISM study are provided in Appendix C.

Source Area Monitoring Well MW-7

- *Dehalococcoides* populations in both the control (MNA) and sugar/yeast/ vitamin biostimulated (BioStim) units were detected, but were below the 10^4 cells/mL considered a threshold concentration for a generally effective rate of dechlorination. Dechlorinating enzyme gene copies were low to non-detect, consistent with low *Dehalococcoides* populations.
- Although DCE, VC, and ethene daughter products were detected in both the MNA and BioStim units, TCE was the contaminant present in the highest concentration (205,000 µg/L). These results are consistent with low *Dehalococcoides* populations.
- The methane concentrations were similar in both the MNA and BioStim units, and VFAs (volatile fatty acids) were not detected in either unit.
- Anion concentrations were similar in both the MNA and BioStim units.
- *Dehalococcoides* and contaminant concentrations were comparable in both units, suggesting that the sugar/yeast/vitamin blend did not substantially enhance growth of dechlorinating bacteria and increase reductive dechlorination within the 91-day study period.

Mid Plume Monitoring Well MW-4

- High concentrations of *Dehalococcoides* and both vinyl chloride reductase enzyme genes were detected in the MNA unit, indicating the potential for complete reductive dechlorination of TCE to ethene under existing site conditions.
- Consistent with the qPCR results, *cis*-DCE was the predominant contaminant, and vinyl chloride and ethene daughter products were also present in the MNA unit.
- The *Dehalococcoides* population in the BioStim unit was an order of magnitude higher compared to the MNA unit. Vinyl chloride reductase genes were also higher in the BioStim unit compared to MNA levels, suggesting that the sugar/yeast/vitamin blend enhanced growth of dechlorinating bacteria within the 91-day study period.
- The contaminant results were similar in both the MNA and BioStim units. The primary contaminant was *cis*-DCE (37,900 µg/L), and substantial concentrations of vinyl chloride (3,420 µg/L) and ethene (700 µg/L) were also detected.
- While the methane concentration was only slightly higher in the BioStim unit compared to the MNA unit, the concentrations in both units were two orders of magnitude higher than in the units deployed in MW-7. The higher methane concentrations in MW-4 also correlated with higher concentrations of *Dehalococcoides* and increased degradation of chlorinated ethenes compared to MW-7.
- Anion concentrations were similar in both the MNA and BioStim units.
- Overall, the results from the MNA unit indicated that current environmental conditions are conducive to reductive dechlorination. With the addition of the sugar/yeast/vitamin blend, concentrations of *Dehalococcoides* and vinyl chloride

reductase genes did increase, but contaminant concentrations and geochemistry were not substantially different from those in the MNA unit.

The Bio-Trap ISM treatability study provided a tertiary line of evidence demonstrating that MNA via intrinsic biodegradation is functional at the Site. There was a slight downward trend in contaminant concentrations in the biostimulated ISMs compared to the MNA control units, with TCE decreasing from 205,000 to 168,000 µg/L (MW-7) and 155 to 66 µg/L (MW-4); *cis*-DCE decreasing from 42,900 to 35,100 µg/L (MW-7) and 39,800 to 37,900 µg/L (MW-4); and VC decreasing from 2,200 to 1,800 µg/L (MW-7) and 4,810 to 3,420 µg/L (MW-4). Since the molecular biological indicators are favorable, it is reasonable to expect contaminant concentrations to continue to decline over time in response to an increase in organic carbon.

CONCLUSIONS

Based on the results of the May 2014 sampling round within the framework of the historical results, natural attenuation of COCs is occurring via reductive dechlorination. GZA offers the following additional observations relative to the 2014 sampling round:

- The COC concentrations of the parent compounds are decreasing from the source area (MW-7) downgradient to the mid-point of the plume (MW-4 and MW-10), and from the mid-point and on to the downgradient portions of the Site (MW-11 through MW-13).
- There is an increase in daughter compound concentrations from the source area to the mid-point of the plume, with an overall decrease in total COC concentrations.
- The COCs were not detected above laboratory method detection limits at the downgradient property line (MW-11 and MW-13).

It should be noted that there is a temporal decreasing trend in TOC concentrations across the Site. TOC, as discussed previously, represents a surrogate measurement of the "fuel" driving reductive dechlorination and should continue to be monitored.

Conclusions of the Treatability Study:

<u>At the Source area (MW-7):</u>

- *Dehalococcoides* populations were detected in both the control and carbon amendment units. However, population counts were below the concentration at which an effective rate of dechlorination generally occurs.
- Addition of the organic carbon amendment at the source location did not substantially enhance growth of dechlorinating bacteria and increase reductive dechlorination within the study period.

<u>At the mid-plume location (MW-4):</u>

- High concentrations of *Dehalococcoides* and both vinyl chloride reductase enzyme genes were detected in the MNA unit, indicating the potential for complete reductive dechlorination of TCE to ethene under existing site conditions.
- The *Dehalococcoides* population in the BioStim unit, in which the organic carbon was added, was an order of magnitude higher compared to the MNA unit. Vinyl chloride reductase genes were also higher in this unit compared to MNA levels, suggesting that the carbon amendment enhanced growth of dechlorinating bacteria within the study period. Contaminant concentrations and geochemistry, however, were not substantially different from those in the MNA unit.

RECOMMENDATIONS:

The treatability study confirmed that current conditions mid-plume show potential for complete reductive dechlorination of TCE to ethane. COCs were not detected in groundwater collected from the downgradient Site boundary, providing additional confirmation of continued natural attenuation. GZA recommends continued annual groundwater monitoring to confirm maintenance of natural attenuation parameters and continued spatial and temporal decrease in COCs.

Recommended groundwater monitoring will utilize the same eight monitoring wells (MW-4, -7, -10, -11, -12, -13, -14 and -15), as stated in the SMP, in the Spring of 2015. The natural attenuation analytical parameter list used during the 2014 sample round should also be used in the 2015 sample round.

Please do not hesitate to contact the undersigned if you have any questions or require any additional information.

Sincerely,

GZA GEOENVIRONMENTAL OF NEW YORK

Thomas Bohlen
Project Geologist

James Richert
Senior Project Manager

Bart A. Klettke, P.E.
Principal

Karen Kinsella
Consultant Reviewer

Table 1	Natural Attenuation Parameter Results
Figure 1	Groundwater Analytical Data Summary
Figure 2	Total COC Contour Map
Figure 3	Groundwater Isopotential Map
Appendix A:	Monitoring Well Observations & Groundwater Sampling Logs
Appendix B:	COC Data Graphs
Appendix C:	Results EPA cVOC Monitored Natural Attenuation Ranking System

Attachment A: Analytical Laboratory Reports

TABLE

Table 1
Summary of Groundwater Field Measurements and Analytical Test Results for Natural Attenuation Parameters
DRAFT May 2014 Groundwater Sampling
Delphi Thermal Systems
West Lockport Complex
Lockport, New York

		Field Parameters					Analytical Test Results - Inorganic and Miscellan																
Location	Sample Date	Temp. (Deg. C)	Specific Cond. (mS/cm)	DO (mg/L)	ORP (mv)	pH (Std Units)	Methane (mg/L)	Ethane (mg/L)	Ethene (mg/L)	Carbon Dioxide (mg/L)	Hydrogen (nm)	Organic Carbon (mg/L)	Alkalinity (mg/L)	Ammonia (mg/L)	Chloride (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)	Nitrate Nitrite (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Calcium (mg/L)	Dissolved Calcium (mg/L)	Iron (mg/L)
MW-4	12/2/1998	14.2	2.730	0.23	-56	6.6	2.9					19	354	1.23	986	0.30	<0.05		120	0.2	503	443	0.58
MW-4 DUP	12/2/1998	NA	NA	NA	NA	NA	5.5					8	368	1.57	971	0.05	<0.05		120	0.2	431	335	0.59
MW-4	10/7/1999	13.8	3.412	0.08	-92.8	6.7	4.2					47	360	1.03	1,010			0.08	110	0.3	269	318	0.42
MW-4	8/9/2001	12.6	3.420	0.12	-5.1	6.5	0.12					20.2	366	1.20	1,300	0.11	<0.05		190	0.2	371		1.01
MW-4	10/31/2001	13.8	3.444	0.10	-128.0	6.6	3.3					10.8	366	1.17	1,100	<0.05	<0.05		160	1.2			0.77
MW-4	7/20/2009	17.7	1.263	0.28	35.1	6.41	5.28					13	330	3.83	5,320	<0.6	<0.6		295	2.0			
MW-4	4/29/2010	15.0	9.664	0.96	-2.1	6.5	1.8					4.3	333	NA	3,510	<0.05	<0.05		272	<1.0			
MW-4 DUP	4/22/2011	11.85	7.391	0.73	-349.0	6.77	2					0.6	343	1.9	3,260	<0.05	<0.05		370	<0.1	493		3.1
MW-4	4/20/2012 [9]	14.5	10.130	6.00	40.5	6.09	3.8	0.65	2.3	9.5	28	3.1	320	2.6	3,580	<0.05	<0.05		282	<0.1			2.7
MW-4	5/1/2013	14.5	13.320	0.18	-34.2	6.62	<0.22	<0.0049	<0.0052	23	0.63	2.8	329	3.4	4,300	<0.02	<0.02		268	<0.052			3.9
MW-4	5/13/2014	14.6	6.830	0.04	-21.1	6.92	1.2	0.075	0.31	14	0.52	2.9	299	1.7	1,750	0.079	<0.02		223	<0.052			0.81
MW-6	12/2/1998	19.5	3740.000	0.30	-67	6.8	0.84					9	319	0.45	897	0.22	<0.05		160	0.2	161	156	7.98
MW-6	10/7/1999	21.9	3283.000	0.12	-145.8	7.1	0.34					30	260	0.32	476			0.09	140	0.4	86.4	108	3.62
MW-7	12/3/1998	17.3	3.130	0.33	-35	7.0	0.06					36	376	1.43	944	0.29	<0.05		200	0.4	382	375	0.14
MW-7 [3]	10/7/1999	19.4	3.049	0.69	-52	7.1	0.02					58	420	1.10	1,180			0.11	180	0.4	286	255	0.86
MW-7	10/25/2006	17.4	2.620	1.08	-92	7.1	0.06					28	376	1.33	600	<0.05	<0.05		470	<0.01			0.23
MW-7	11/29/2007	15.5	2.162	0.83	-195	7.2	0.13					14	322	1.14	430	<0.05	<0.05		519	0.8			0.58
MW-7	11/4/2008	16.2	3.152	0.33	-80	6.8	0.11					4.4	348	0.08	980	<0.05	<0.05		23	<0.1	327		6.06
MW-7	2/24/2009	13.1	1.718	1.22	-68	7.3	0.04					NM	270	0.98	410	<0.05	<0.05		430	<0.1	193		0.09
MW-7	7/20/2009	16.4	2.558	0.88	32	7.1	0.07					28	310	1.28	452	<0.6	<0.6		460	2.4			
MW-7	4/29/2010	15.0	1.540	3.14	-13.4	7.24	0.057					10.9	239	NA	280	<0.05	<0.05		479	<1.0			
MW-7	4/22/2011	10.4	1.241	3.75	-334	7.68	0.015					9.2	223	0.53	267	<0.05	<0.05		463	<0.1	121		0.20
MW-7	4/20/2012	15.4	1.830	0	-34	7.49	0.046	0.017	0.098	1.6		8.7	240	0.77	416	<0.05	<0.05		332	<0.1			0.06
MW-7	5/3/2013	13.2	2.530	2.05	-55.6	7.3	0.12	0.032	0.25	4.4		7.6	242	0.75	569	<0.02	<0.02		253	<0.052			0.02
MW-7	5/30/2014	13..2	2.230	1.78	-10.7	7.32	0.009	<0.0075	0.048	4.3	NM	5.4	258	0.43	292	<0.02	<0.02		138	<0.052			<0.019
MW-8	12/2/1998	16.7	3.210	0.90	-68	6.9	0.09					12	300	0.40	138	<0.05	<0.05		550	0.2	215	227	0.33
MW-8	10/7/1999	19.7	1.640	0.08	-116.1	7.1	0.04					19	280	0.33	144			0.10	570	0.3	174	188	0.22
MW-8	7/15/2009	16.3	2.408	0.20	-48.6	6.9	2.0					22	300	0.76	457	<0.6	<0.6		588	2			
MW-8	4/22/2011	9.39	2.327	4.56	-334	7.26	0.018					<1	244	0.30	683	<0.05	<0.05		562	<0.1	220		0.12
MW-9	12/2/1998	16.2	7.150	1.6	120	6.9	0.04					3	309	0.23	640	0.25	<0.05		680	<0.1	330	300	0.33
MW-9	10/5/1999	18.7	4.042	0.08	103.5	6.9	0.02					24	330	0.20	963	0.46	<0.05		520	<0.1	250	283	0.20
MW-9 DUP	10/5/1999	NA	NA	NA	NA	NA	0.02					27	340	0.14	833	0.63	<0.05		490	<0.1	252	284	0.20
MW-9	7/20/2009	17.8	8.381	0.41	109.1	6.7	0.03					17	290	0.26	3,100	<0.6	0.9		379	1.2			
MW-9	4/22/2011	9.49	7.263	0.24	-345	7.08	0.0069					<1	233	0.11	3,410	0.39	<0.05		362	<0.1	392		0.03
MW-10	12/1/1998	14.5	4.100	0.40	-13.7	6.7	0.23					11	320	0.32	1,220	0.19	<0.05		270	0.2	310	305	1.95
MW-10	10/5/1999	14.2	4.775	0.07	-2.0	6.8	0.14					24	280	0.29	1,010	0.15	0.10		240	<0.1	39.8	254	0.73
MW-10	8/9/2001	12.2	5.033	0.17	249.1	6.6	0.018					10.0	334	0.16	1,700	0.08	<0.05		330	0.1	330		0.14
MW-10	10/31/2001	14.4	3.990	0.15	90.9	6.7	0.20					3.6	336	0.12	2,800	0.17	<0.05		280	1.6			0.05
MW-10	7/15/2009	13.2	9.579	0.76	79.6	6.6	0.36					33.0	330	0.27	4,260	<0.6	<0.6		276	0.8			
MW-10 (DUP)	4/28/2010	11.0	3.741	0.35	16.2	6.88	0.14					4.3	263	NA	1,460	0.053	<1.0		168	<1.0			
MW-10	4/19/2012 [9]	12.71	7.974	5.16	129.1	6.1	0.170	0.009	0.009	5.6	1	2.3	280	0.11	3,790	<0.05	<0.05		210	<0.1			0.32
MW-10	5/1/2013	11.9	4.820	0.75	131.2	7.05	0.058	0.001	0.001	7.4	0.77	3.3	270	0.039	1,470	0.33	<0.02		153	<0.052			0.48
MW-10	5/14/2014	13.2	8.370	0.1	105.7	6.85	0.110	<0.0015	<0.0015	15.0	0.95	3.5	272	0.01	2,580	<0.02	<0.02		370	<0.052			0.07
MW-11	12/1/1998	11.9	4.360	0.22	-271	7.6	0.01					17	275	0.58	188	0.17	<0.05		110	0.2	122	97.3	1.00
MW-11	10/5/1999	11.9	5.228	2.34	-231	7.7	0.05					20	270	0.76	192	0.05	<0.05		210	0.5	93.4	150	0.34
MW-11	8/8/2001	10.4	3.576	0.12	-73.6	7.4	<0.002					12	285	0.46	250	<0.05	<0.05		140	0.1	111		0.14
MW-11	10/30/2001	12.0	4.126	0.04	-248.8	7.5	<0.002					3.1	265	0.46	230	<0.05	<0.05		110	2.8			0.02
MW-11	10/24/2006	13.1	8.000	1.61	-106	7.3	0.008					1.9	341	0.12	108	0.16	<0.05		66	<0.1			0.80
MW-11	11/28/2007	10.7	1.390	0.38	-309	7.2	0.008					3	233	0.38	410	0.18	<0.05		144	1.0			0.74
MW-11	11/4/2008	14.4	1.377	0.56	-200	7.3	0.005					2.38	249	0.28	200	<0.05	<0.05		101	0.2	95.6		0.38
MW-11	7/16/2009	13.7	1.143	0.33	-15.2	7.3	0.019					16	260	0.45	246	<0.6	<0.6		112	2.0			
MW-11	4/28/2010	9.2	1.145	0.46	-126.3	7.3	0.013					2.1	245	NA	325	0.109	<0.05		93.6	<1.0			
MW-11	4/21/2011	7.5	0.807	1.72	-325	7.56	0.0071					2.8	294	0.038	170	0.32	<0.05		53.5	<0.1	92.5		0.14
MW-11	4/18/2012	10.9	1.450	0	-75	7.6	0.014	0.00099	0.0013	2.1	12	1.3	248	0.27	360	0.095	<0.05		98.9	0.053			0.20
MW-11	5/2/2013	9.7	1.670	0.71	-101.9	7.41	0.04	0.001	0.0013	4.2	0.91	1.6	259	0.15	333	0.34	<0.02		84.6	<0.052			0.70
MW-11	5/20/2014	9.6	1.310	0.64	-72.6	7.41	0.0067	<0.0015	<0.0015	5	60	1.2	274	0.12	200	0.29	<0.02		61.5	<0.052			0.18

Notes:
1. In general the field parameters were stable with very little variation. However, as noted, some readings varied.
2. Readings were collected using a low flow peristalic pump and water quailty meter with flow through cell..
3. Analytical Testing completed by TestAmerica Laboratories, Inc.
4. < - Indicates compound not detected above the specified detection limit.
5. Blank = Not tested.

Table 1
Summary of Groundwater Field Measurements and Analytical Test Results for Natural Attenuation Parameters
DRAFT May 2014 Groundwater Sampling
Delphi Thermal Systems
West Lockport Complex
Lockport, New York

		Field Parameters					Analytical Test Results - Inorganic and Miscellan																
Location	Sample Date	Temp. (Deg. C)	Specific Cond. (mS/cm)	DO (mg/L)	ORP (mv)	pH (Std Units)	Methane (mg/L)	Ethane (mg/L)	Ethene (mg/L)	Carbon Dioxide (mg/L)	Hydrogen (nm)	Organic Carbon (mg/L)	Alkalinity (mg/L)	Ammonia (mg/L)	Chloride (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)	Nitrate Nitrite (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Calcium (mg/L)	Dissolved Calcium (mg/L)	Iron (mg/L)

6. NM = not measured
7. ND = non-detect for tested volatile fatty acids: acetic acid, formic acid, lactic acid, n-Butyric acid, propionic acid, and pyruvic acid.
8. All tested volatile fatty acids = ND; except acetic acid (7.0 ppm).
9. Water quality readings were recollected on 5/4/2012 due to lack of DO readings collected with initial water quality meter.

Table 1
Summary of Groundwater Field Measurements and Analytical Test Results for Natural Attenuation Parameters
DRAFT May 2014 Groundwater Sampling
Delphi Thermal Systems
West Lockport Complex
Lockport, New York

		Field Parameters					Analytical Test Results - Inorganic and Miscellan																
Location	Sample Date	Temp. (Deg. C)	Specific Cond. (mS/cm)	DO (mg/L)	ORP (mv)	pH (Std Units)	Methane (mg/L)	Ethane (mg/L)	Ethene (mg/L)	Carbon Dioxide (mg/L)	Hydrogen (nm)	Organic Carbon (mg/L)	Alkalinity (mg/L)	Ammonia (mg/L)	Chloride (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)	Nitrate Nitrite (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Calcium (mg/L)	Dissolved Calcium (mg/L)	Iron (mg/L)
MW-12	12/1/1998	13.4	2.006	0.39	-41	6.9	0.5					7	284	0.94	294	0.48	<0.05		73	0.2	119	104	7.48
MW-12	10/5/1999	15.8	1.849	0.10	-105.2	7.0	0.36					30	300	0.90	342	0.27	<0.05		66	0.2	104	126	<0.01
MW-12	8/8/2001	13.5	3.300	0.24	-38.5	6.6	0.50					13.9	336	1.77	920	<0.05	<0.05		160	<0.1	217		16.9
MW-12 DUP	8/8/2001	NA	NA	NA	NA	NA	0.74					14.9	338	1.85	930	<0.05	<0.05		160	<0.1	217		14.8
MW-12	10/30/2001	14.2	2.850	0.14	-127.1	6.8	0.57					5.7	309	1.35	590	0.18	<0.05		110	3.5			4.73
MW-12	10/25/2006	13.7	3.500	1.26	-127.1	6.9	0.024					6.5	333	1.55	1,300	<0.05	<0.05		110	<0.1			7.50
MW-12	11/28/2007	11.2	3.307	0.18	-302	7.0	0.012					4.0	274	1.47	1,300	<0.05	<0.05		79	<0.04			6.68
MW-12	11/4/2008	14.3	6.319	0.02	-88	6.7	0.12					2.74	332	2.08	2,000	<0.05	<0.05		138	<0.1	259		13.70
MW-12	3/16/2009	6.1	4.516	1.08	-48	6.6	0.87					NM	270	1.89	2,300	<0.05	<0.05		140	<0.1	269		11.50
MW-12	7/16/2009	14.5	6.493	0.64	-39.3	6.7	0.9					14	360	2.57	2,480	<0.6	<0.6		148	0.8			
MW-12	4/28/2010	8.8	6.562	0.32	-46.1	6.6	0.46					5.0	315	NA	2,630	<0.05	0.039		153	<1.0			
MW-12	4/20/2011	8.83	6.320	0.00	-65	6.9	0.042					3.3	272	1.1	1,880	<0.05	<0.05		108	<1.0	227		6.6
MW-12	4/18/2012	10.02	7.920	0.59	-74	7.0	0.3	0.011	0.011	15	0.76	3.7	280	1.8	2,900	<0.05	<0.05		133	<1.0			12.7
MW-12	5/3/2013	9	7.300	0.31	-48.3	6.8	0.2	0.0031	0.0042	14	1.1	3.6	232	1.2	3,090	<0.02	<0.02		120	<0.052			8.1
MW-12	5/19/2014	11.1	5.400	0.11	-41.2	6.9	0.11	<0.0015	<0.0015	16	33	4	291	1.2	1,650	0.032	<0.02		96.5	<0.052			3.7
MW-13	8/8/2001	15.4	5.742	0.23	-118.5	7.8	0.08					15.2	255	1.45	1,900	0.05	<0.05		160	<0.1	209		2.59
MW-13	10/29/2001	15.5	6.625	0.20	-136	7.4	0.07					9.9	426	1.29	1,700	0.61	0.08		120	2.2			3.75
MW-13	10/24/2006	15.2	6.090	2.67	-146	7.3	0.16					8.4	431	1.35	2,200	<0.05	<0.05		98	<0.1			9.21
MW-13	11/28/2007	12.7	5.696	0.08	-274	7.3	0.003					7.0	420	1.74	2,200	0.05	<0.05		95	0.4			7.83
MW-13	11/5/2008	7.08	6.782	0.12	-97	7.1	0.021					3.8	410	1.57	2,000	<0.05	<0.5		91	<0.1	196		7.60
MW-13	7/16/2009	16.0	6.476	0.60	-113.4	7.2	6.15					15	400	2.10	2,290	<0.6	<0.6		112	<0.5			
MW-13	4/28/2010	9.4	5.783	0.28	-133.5	7.2	0.17					6.1	382	NA	2,280	0.069	<0.05		102	<1.0			
MW-13	4/21/2011	7.64	5.023	0.34	-336	7.4	0.058					5.8	368	0.94	2,090	0.069	<0.05		105	<0.1	210		7.4
MW-13 DUP	4/19/2012	10.7	5.480	0.00	-120	7.4	0.093	0.0086	0.008	4.5	0.79	4	360	0.96	1,490	0.081	<0.05		71.3	<0.1			5.8
MW-13	5/2/2013	10.5	5.410	1.27	-71.2	7.3	0.11	<0.0049	<0.0052	3.7	0.69	3.8	382	0.6	1,590	0.57	<0.02		62.7	<0.052			4.7
MW-13	5/20/2014	11.5	5.850	0.24	-82.1	7.1	0.073	<0.0015	<0.015	16	1.8	4.5	419	0.88	1,740	0.089	<0.05		82.5	<0.052			6.4
MW-14	8/9/2001	11.5	2.064	3.66	330.7	7.2	<0.002					14.1	328	0.19	680	0.08	<0.05		130	<0.1	144		0.18
MW-14	10/30/2001	13.2	2.478	0.80	-39.1	7.2	0.013					4.3	334	0.31	770	<0.05	<0.05		120	2.5			0.06
MW-14	10/24/2006	12.9	4.310	3.11	-60.6	7.2	0.31					3.3	336	0.25	1,700	<0.05	<0.05		88	<0.1			0.15
MW-14	11/29/2007	10.3	4.402	1.27	-110	7.1	0.16					4.0	371	0.53	1,800	<0.05	<0.05		87	0.12			0.44
MW-14	11/4/2008	14.5	6.397	0.13	11.2	6.8	0.14					2.4	340	0.39	2,100	<0.05	<0.05		80	<0.1	320		0.39
MW-14	2/24/2009	5.3	3.534	0.73	-34	7.2	0.15					NM	299	0.23	1,500	0.07	<0.05		68	<0.1	165		0.06
MW-14	7/16/2009	11.6	5.970	1.87	72.6	6.8	0.465					51	380	0.69	2,430	<0.6	<0.6		81.4	1.2			
MW-14	4/27/2010	9.8	3.726	0.32	16.8	7.1	0.055					2.7	354	NA	1,450	0.03	<0.05		65.7	<1.0			
MW-14	4/21/2011	7.72	3.779	2.45	-335	7.5	0.016					2.8	339	0.14	1,750	0.093	<0.05		78.2	<0.1	149		0.052
MW-14	4/19/2012	10.85	5.460	0.00	-9	7.3	0.071	0.0086	0.0083	2.9	6.7	1.5	328	0.25	1,720	<0.05	<0.05		88.2	<0.1			0.140
MW-14	5/3/2013	10.1	4.670	0.17	-1.8	7.3	0.05	<0.00049	<0.00052	6.2	16	1.7	361	0.15	1,340	0.061	<0.02		60	<0.052			0.038
MW-14	5/23/2014	9.4	3.400	0.07	22.7	7.3	0.0083	<0.015	<0.015	7.14	2.3	1.6	396	0.055	790	<0.02	0.036		34.7	<0.052			0.036
MW-15	10/30/2001	14.6	1656.000	0.16	83.9	6.8	<0.002					4.1	395	0.07	410	0.85	<0.05		110	1.4			0.02
MW-15 DUP	11/4/2008	14.3	4.719	2.42	75	6.8	<0.002					1.77	345	0.07	1,900	0.34	<0.05		110	<0.1	327		<0.02
MW-15	7/16/2009	14.6	3.349	1.49	135.7	6.8	<0.004					12	400	<0.1	1,130	1.7	<0.6		88.7	1.6			
MW-15	4/28/2010	9.5	1.998	0.35	41.1	6.8	<0.0022					3.3	419	NA	627	1.03	<0.02		66.0	<0.7			
MW-15	4/21/2011	7.71	2.294	2.43	-328	6.8	<0.0022					3.5	394	<0.02	895	0.95	<0.02		86.7	<0.1	217		0.02
MW-15	4/18/2012	10.95	3.537	4.77	385.1	7.1	0.00047	0.00078	0.00064	11	0.82	2	384	<0.02	962	0.73	<0.02		111	<0.1			<0.05
MW-15	5/1/2013	11	2.950	0.19	88.3	6.9	<0.00022	<0.00049	<0.00052	15	0.75	2.1	415	<0.009	672	1.4	<0.02		74.7	<0.052			<0.019
MW-15	5/19/2014	10	2.500	0.10	120.4	6.9	<0.001	<0.0015	<0.0015	21	0.83	2.2	439	0.033	590	0.46	<0.02		55.2	<0.052			<0.019
TK-2	10/6/1999	13.3	7.02	0.19	66.9	7.5							380		20.2								
Stream (SS-1)	12/2/1998	8.0	300	10.0	50	8.0																	
Stream (SS-2)	10/7/1999	10.2	718	17.5	53.1	8.4																	
Stream (SS-3)	10/7/1999	8.5	1552	8.9	-28.9	7.7																	

Notes:
1. In general the field parameters were stable with very little variation. However, as noted, some readings varied.
2. Readings were collected using a low flow peristalic pump and water quailty meter with flow through cell..
3. Analytical Testing completed by TestAmerica Laboratories, Inc.
4. < - Indicates compound not detected above the specified detection limit.
5. Blank = Not tested.
6. NM = not measured
7. ND = non-detect for tested volatile fatty acids: acetic acid, formic acid, lactic acid, n-Butyric acid, propionic acid, and pyruvic acid.
8. All tested volatile fatty acids = ND; except acetic acid (7.0 ppm).
9. Water quality readings were recollected on 5/4/2012 due to lack of DO readings collected with initial water quality meter.

eous Water Quality Parameters

Dissolved Iron (mg/L)	Magnesium (mg/L)	Dissolved Magnesium (mg/L)	Manganese (mg/L)	Dissolved Manganese (mg/L)	Sodium (mg/L)	Dissolved Sodium (mg/L)	Potassium (mg/L)	Dissolved Potassium (mg/L)	Volatile Fatty Acids (mg/L)
0.51	105	106	0.40	0.32	282	293	13.3	12.8	
0.52	107	100	0.39	0.34	282	306	13.2	13.5	
0.45	98	116	0.23	0.34	240	305	10.4	13.1	
	107		0.54		384		12.7		
	102		0.46		358		12.3		
3.21		193		2.64		2,100		50.5	
3.15		152		1.86		1,700		26.1	
	139		1.6		1420		17.8		
	138		1.5		1400		15.6		ND
	163		2.0		2080		20.2		ND
	63.8		0.47						
1.13	35.6	28.8	0.48	0.29	619	638	9.64	9.51	
0.55	24	30.2	0.24	0.19	300	311	7.4	8.8	
0.02	118	136	<0.01	<0.01	288	351	20.5	23.0	
0.05	138	145	0.05	0.02	292	306	21.4	24.0	
	112		0.02		237		19.4		
	98.5		0.05		278		20.7		
	74		2.28		277		4.39		
	86.7		0.04		213		14.2		
0.03		84.9		0.03		230		24.1	
0.41		70.2		0.02		204		13.9	
	60.1		0.025		3290		13.8		
	67.1		0.024		193		13.2		Note 8.
	76		0.190		254		14.3		Note 8.
	34.7		0.009						
0.17	76	78	0.31	0.32	102	114	6.31	6.67	
0.15	82.4	97.5	0.30	0.31	112	110	7.6	8.1	
0.03		102		0.40		246		15.7	
	102		0.53		355		7.9		
<0.01	89	84.5	1.74	0.93	444	445	5.52	5.91	
0.02	63.8	89	1.36	0.99	476	535	4.6	26.5	
0.02	72	86	1.46	0.94	478	560	5.0	5.6	
<0.01		117		0.31		1,600		19.0	
	94.9		0.11		1,710		6.9		
0.76	54.6	85.5	2.30	2.07	584	645	13.4	13.2	
0.04	9.94	102	0.99	1.12	33.2	635	18.8	10.1	
	98.9	99.6	1.66		857	845	9.2		
	92.1		0.91		720		7.6		
0.08		103		2.63		1,950		21.1	
10.5		35.0		1.31		890		4.57	
	95.5		2.40		2110		7		ND
	31.8		1.50		845		3.4		ND
	53.7		1.90						
0.26	39.0	36.4	0.11	0.08	116	129	8.88	10.1	
0.30	46.4	103	0.08	0.08	180	695	10.9	27	
	43.2		0.12		130		8.0		
	38.7		0.41		120		9.1		
	30.7		0.08		85		7.6		
	42.1		0.08		235		12.3		
	38.8		0.08		134		8.4		
0.11		41.3		0.11		138		11.4	
2.55		44.3		0.220		152		8.94	
	30.8		0.09		119		5.7		
	48.5		0.14		143		8.3		ND
	47.0		0.17		151		9.0		ND
	34.4		0.13						

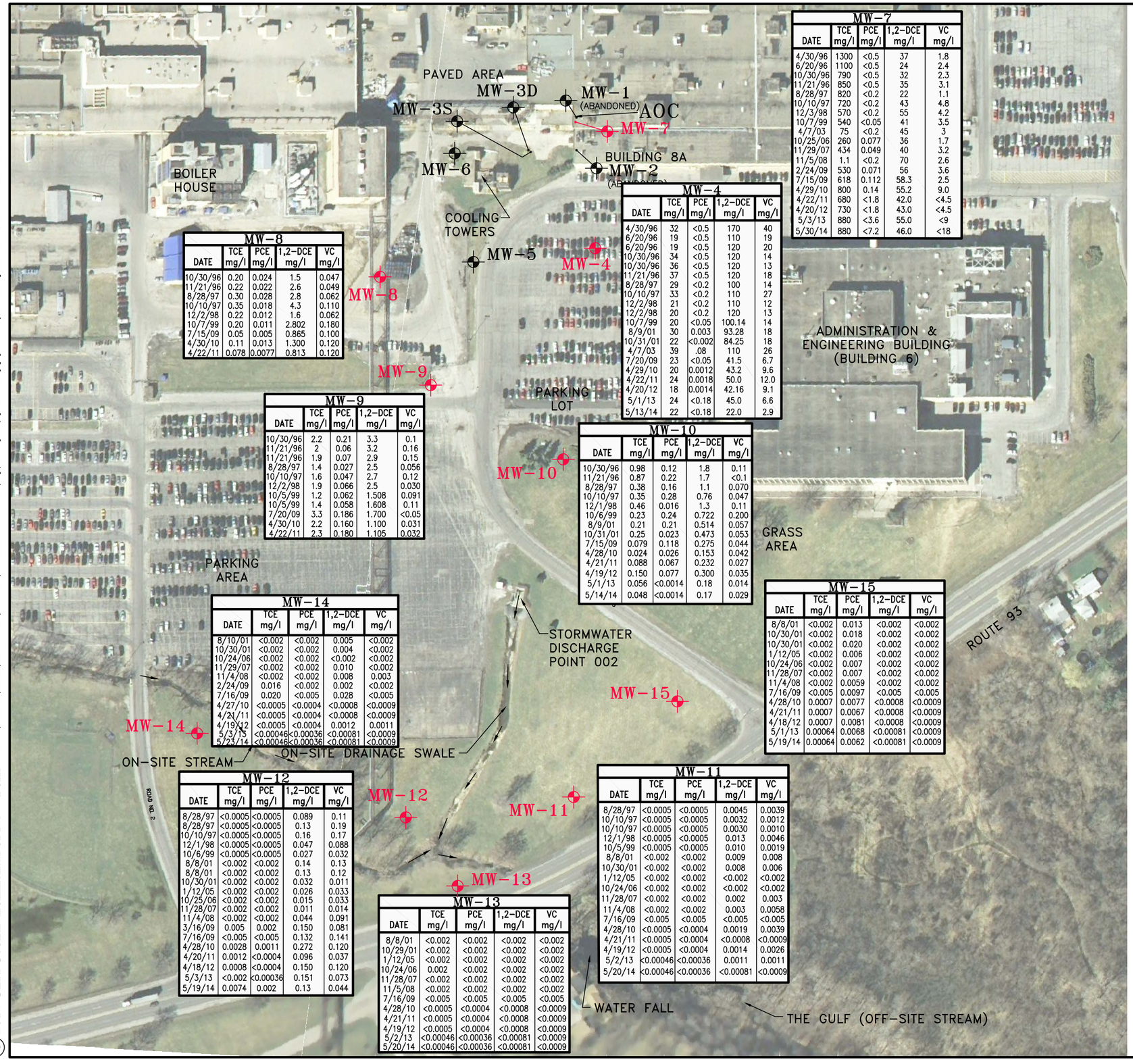
eous Water Quality Parameters

Dissolved Iron (mg/L)	Magnesium (mg/L)	Dissolved Magnesium (mg/L)	Manganese (mg/L)	Dissolved Manganese (mg/L)	Sodium (mg/L)	Dissolved Sodium (mg/L)	Potassium (mg/L)	Dissolved Potassium (mg/L)	Volatile Fatty Acids (mg/L)

eous Water Quality Parameters

Dissolved Iron (mg/L)	Magnesium (mg/L)	Dissolved Magnesium (mg/L)	Manganese (mg/L)	Dissolved Manganese (mg/L)	Sodium (mg/L)	Dissolved Sodium (mg/L)	Potassium (mg/L)	Dissolved Potassium (mg/L)	Volatile Fatty Acids (mg/L)
4.01	26.8	25.3	4.41	4.40	183	197	4.1	3.81	3.81
3.66	27.8	31.6	<0.01	4.90	166	226	4.9	5.3	5.3
	57.5		8.41		427		6.3		
	56.2		8.14		433		6.0		
	37.0		4.69		342		5.0		
	44.8		6.02		684		4.5		
	46.0		4.44		666		3.9		
	69.7		7.82		1110		5.6		
	81.7		8.60		1060		5.1		
15.10		79.1		9.07		1,170		10.9	10.9
14.0		98.0		10.40		1,470		5.22	5.22
	65.1		7.1		958		3.7		
	84.3		9.1		1250		3.7		ND
	76.4		7.4		1260		3.9		ND
	50.0		4.9						
	49.6		2.67		1,200		12.1		
	40.9		2.96		1,160		8.2		
	53.7		6.03		1,210		9.1		
	50.8		4.95		1,250		9.6		
	52.3		5.40		1,430		11.0		
1.75		53.9		6.51		1,390		18.9	18.9
9.12		59.9		7.18		1,380		11.2	11.2
	53.2		6.30		1,320		8.3		
	38.5		4.40		940		5.4		ND
	39.4		4.30		964		6.2		ND
	42.3		4.40						
	64.1		0.04		394		6.4		
	64.8		0.06		466		7.3		
	94.9		0.20		831		8.0		
	111		0.25		777		10.5		
	138		0.28		1010		13.5		
	79.8		0.18		833		7.3		
0.11		132		0.53		931		21.1	21.1
0.06		70.2		0.194		870		6.22	6.22
	68		0.19		875		5.4		
	86.7		0.29		916		6.2		ND
	59.4		0.20		850		5.1		ND
	40.1		0.30						
	47.5		0.40		196		3.8		
	82.3		0.82		594		6.1		
0.02		65.0		0.14		475		7.94	7.94
<0.019		48.2		0.13		318		3.14	3.14
	55.5		0.24		390		3.7		
	54.4		0.24		424		3.3		ND
	43.7		0.21		384		3.2		ND
	42.5		0.11						

FIGURES



MW-8

DATE	TCE mg/l	PCE mg/l	1,2-DCE mg/l	VC mg/l
10/30/96	0.20	0.024	1.5	0.047
11/21/96	0.22	0.022	2.6	0.049
8/28/97	0.30	0.028	2.8	0.062
10/10/97	0.35	0.018	4.3	0.110
12/2/98	0.22	0.012	1.6	0.062
10/7/99	0.20	0.011	2.802	0.180
7/15/09	0.05	0.005	0.865	0.100
4/30/10	0.11	0.013	1.300	0.120
4/22/11	0.078	0.0077	0.813	0.120

MW-9

DATE	TCE mg/l	PCE mg/l	1,2-DCE mg/l	VC mg/l
10/30/96	2.2	0.21	3.3	0.1
11/21/96	2	0.06	3.2	0.16
11/21/96	1.9	0.07	2.9	0.15
8/28/97	1.4	0.027	2.5	0.056
10/10/97	1.6	0.047	2.7	0.12
12/2/98	1.9	0.066	2.5	0.030
10/5/99	1.2	0.062	1.508	0.091
10/5/99	1.4	0.058	1.608	0.11
7/20/09	3.3	0.186	1.700	<0.05
4/30/10	2.2	0.160	1.100	0.031
4/22/11	2.3	0.180	1.105	0.032

MW-14

DATE	TCE mg/l	PCE mg/l	1,2-DCE mg/l	VC mg/l
8/10/01	<0.002	<0.002	0.005	<0.002
10/30/01	<0.002	<0.002	0.004	<0.002
10/24/06	<0.002	<0.002	<0.002	<0.002
11/29/07	<0.002	<0.002	0.010	<0.002
11/4/08	<0.002	<0.002	0.008	0.003
2/24/09	0.016	<0.002	0.002	<0.002
7/16/09	0.020	<0.005	0.028	<0.005
4/27/10	<0.0005	<0.0004	<0.0008	<0.0009
4/21/11	<0.0005	<0.0004	<0.0008	<0.0009
4/19/12	<0.0005	<0.0004	0.0012	0.0011
5/3/13	<0.00046	<0.00036	<0.00081	<0.0009
5/23/14	<0.00046	<0.00036	<0.00081	<0.0009

MW-12

DATE	TCE mg/l	PCE mg/l	1,2-DCE mg/l	VC mg/l
8/28/97	<0.0005	<0.0005	0.089	0.11
8/28/97	<0.0005	<0.0005	0.13	0.19
10/10/97	<0.0005	<0.0005	0.16	0.17
12/1/98	<0.0005	<0.0005	0.047	0.088
10/6/99	<0.0005	<0.0005	0.027	0.032
8/8/01	<0.002	<0.002	0.14	0.13
8/8/01	<0.002	<0.002	0.13	0.12
10/30/01	<0.002	<0.002	0.032	0.011
1/12/05	<0.002	<0.002	0.026	0.033
10/25/06	<0.002	<0.002	0.015	0.033
11/28/07	<0.002	<0.002	0.011	0.014
11/4/08	<0.002	<0.002	0.044	0.091
3/16/09	0.005	0.002	0.150	0.081
7/16/09	<0.005	<0.005	0.132	0.141
4/28/10	0.0028	0.0011	0.272	0.120
4/20/11	0.0012	<0.0004	0.096	0.037
4/18/12	0.0008	<0.0004	0.150	0.120
5/3/13	<0.002	<0.00036	0.151	0.073
5/19/14	0.0074	0.002	0.13	0.044

MW-13

DATE	TCE mg/l	PCE mg/l	1,2-DCE mg/l	VC mg/l
8/8/01	<0.002	<0.002	<0.002	<0.002
10/29/01	<0.002	<0.002	<0.002	<0.002
1/12/05	<0.002	<0.002	<0.002	<0.002
10/24/06	0.002	<0.002	<0.002	<0.002
11/28/07	<0.002	<0.002	<0.002	<0.002
11/5/08	<0.002	<0.002	<0.002	<0.002
7/16/09	<0.005	<0.005	<0.005	<0.005
4/28/10	<0.0005	<0.0004	<0.0008	<0.0009
4/21/11	<0.0005	<0.0004	<0.0008	<0.0009
4/19/12	<0.0005	<0.0004	<0.0008	<0.0009
5/2/13	<0.00046	<0.00036	<0.00081	<0.0009
5/20/14	<0.00046	<0.00036	<0.00081	<0.0009

MW-4

DATE	TCE mg/l	PCE mg/l	1,2-DCE mg/l	VC mg/l
4/30/96	32	<0.5	170	40
6/20/96	19	<0.5	110	19
6/20/96	19	<0.5	120	20
10/30/96	34	<0.5	120	14
10/30/96	36	<0.5	120	13
11/21/96	37	<0.5	120	18
8/28/97	29	<0.2	100	14
10/10/97	33	<0.2	110	27
12/2/98	21	<0.2	110	12
12/2/98	20	<0.2	120	13
10/7/99	20	<0.05	100.14	14
8/9/01	30	0.003	93.28	18
10/31/01	22	<0.002	84.25	18
4/7/03	39	.08	110	26
7/20/09	23	<0.05	41.5	6.7
4/29/10	20	0.0012	43.2	9.6
4/22/11	24	0.0018	50.0	12.0
4/20/12	18	0.0014	42.16	9.1
5/1/13	24	<0.18	45.0	6.6
5/13/14	22	<0.18	22.0	2.9

MW-10

DATE	TCE mg/l	PCE mg/l	1,2-DCE mg/l	VC mg/l
10/30/96	0.98	0.12	1.8	0.11
11/21/96	0.87	0.22	1.7	<0.1
8/28/97	0.38	0.16	1.1	0.070
10/10/97	0.35	0.28	0.76	0.047
12/1/98	0.46	0.016	1.3	0.11
10/6/99	0.23	0.24	0.722	0.200
8/9/01	0.21	0.21	0.514	0.057
10/31/01	0.25	0.023	0.473	0.053
7/15/09	0.079	0.118	0.275	0.044
4/28/10	0.024	0.026	0.153	0.042
4/21/11	0.088	0.067	0.232	0.027
4/19/12	0.150	0.077	0.300	0.035
5/1/13	0.056	<0.0014	0.18	0.014
5/14/14	0.048	<0.0014	0.17	0.029

MW-11

DATE	TCE mg/l	PCE mg/l	1,2-DCE mg/l	VC mg/l
8/28/97	<0.0005	<0.0005	0.0045	0.0039
10/10/97	<0.0005	<0.0005	0.0032	0.0012
10/10/97	<0.0005	<0.0005	0.0030	0.0010
12/1/98	<0.0005	<0.0005	0.013	0.0046
10/5/99	<0.0005	<0.0005	0.010	0.0019
8/8/01	<0.002	<0.002	0.009	0.008
10/30/01	<0.002	<0.002	0.008	0.006
1/12/05	<0.002	<0.002	<0.002	<0.002
10/24/06	<0.002	<0.002	<0.002	<0.002
11/28/07	<0.002	<0.002	0.002	0.003
11/4/08	<0.002	<0.002	0.003	0.0058
7/16/09	<0.005	<0.005	<0.005	<0.005
4/28/10	<0.0005	<0.0004	0.0019	0.0039
4/21/11	<0.0005	<0.0004	<0.0008	<0.0009
4/19/12	<0.0005	<0.0004	0.0014	0.0026
5/2/13	<0.00046	<0.00036	0.0011	0.0011
5/20/14	<0.00046	<0.00036	<0.00081	<0.0009

MW-7

DATE	TCE mg/l	PCE mg/l	1,2-DCE mg/l	VC mg/l
4/30/96	1300	<0.5	37	1.8
6/20/96	1100	<0.5	24	2.4
10/30/96	790	<0.5	32	2.3
11/21/96	850	<0.5	35	3.1
8/28/97	820	<0.2	22	1.1
10/10/97	720	<0.2	43	4.8
12/3/98	570	<0.2	55	4.2
10/7/99	540	<0.05	41	3.5
4/7/03	75	<0.2	45	3
10/25/06	260	0.077	36	1.7
11/29/07	434	0.049	40	3.2
11/5/08	1.1	<0.2	70	2.6
2/24/09	530	0.071	56	3.6
7/15/09	618	0.112	58.3	2.5
4/29/10	800	0.14	55.2	9.0
4/22/11	680	<1.8	42.0	<4.5
4/20/12	730	<1.8	43.0	<4.5
5/3/13	880	<3.6	55.0	<9
5/30/14	880	<7.2	46.0	<18

MW-15

DATE	TCE mg/l	PCE mg/l	1,2-DCE mg/l	VC mg/l
8/8/01	<0.002	0.013	<0.002	<0.002
10/30/01	<0.002	0.018	<0.002	<0.002
10/30/01	<0.002	0.020	<0.002	<0.002
1/12/05	<0.002	0.006	<0.002	<0.002
10/24/06	<0.002	0.007	<0.002	<0.002
11/28/07	<0.002	0.007	<0.002	<0.002
11/4/08	<0.002	0.0059	<0.002	<0.002
7/16/09	<0.005	0.0097	<0.005	<0.005
4/28/10	0.0007	0.0077	<0.0008	<0.0009
4/21/11	0.0007	0.0067	<0.0008	<0.0009
4/18/12	0.0007	0.0081	<0.0008	<0.0009
5/1/13	0.00064	0.0068	<0.00081	<0.0009
5/19/14	0.00064	0.0062	<0.00081	<0.0009

NORTH

NOTES:

1. BASE MAP ADAPTED FROM A 2005 AERIAL PHOTOGRAPH DOWNLOADED FROM http://www.nysgis.state.ny.us/gateway/mg/interactive_main.html AND SITE OBSERVATIONS.

2. ANALYTICAL TESTING WAS COMPLETED BY TEST AMERICA LABORATORIES.

3. UNITS ARE LISTED IN MILLIGRAMS PER LITER (mg/l). (< - INDICATES COMPOUND NOT DETECTED ABOVE THE SPECIFIED DETECTION LIMIT)

4. THE SIZE AND LOCATION OF EXISTING SITE FEATURES SHOULD BE CONSIDERED APPROXIMATE.

LEGEND:

MW-8 — APPROXIMATE LOCATION AND DESIGNATION OF MONITORING WELL INSTALLED BY GZA

AOC — DENOTES AREA OF CONCERN

TCE = TRICHLOROETHENE

PCE = TETRACHLOROETHENE

1,2-DCE = TRANS & CIS 1,2-DICHLOROETHENE

VC = VINYL CHLORIDE

APPROXIMATE SCALE IN FEET

0 90 180 360

DRAWN BY: MDK

DATE: DECEMBER 2014

GZA GeoEnvironmental of New York

GM COMPONENTS HOLDINGS, LLC

DELPHI HARRISON THERMAL SYSTEMS SITE

200 UPPER MOUNTAIN ROAD

LOCKPORT, NEW YORK

MAY 15, 2014 GROUNDWATER SAMPLING

GROUNDWATER ANALYTICAL RESULTS

PROJECT No.

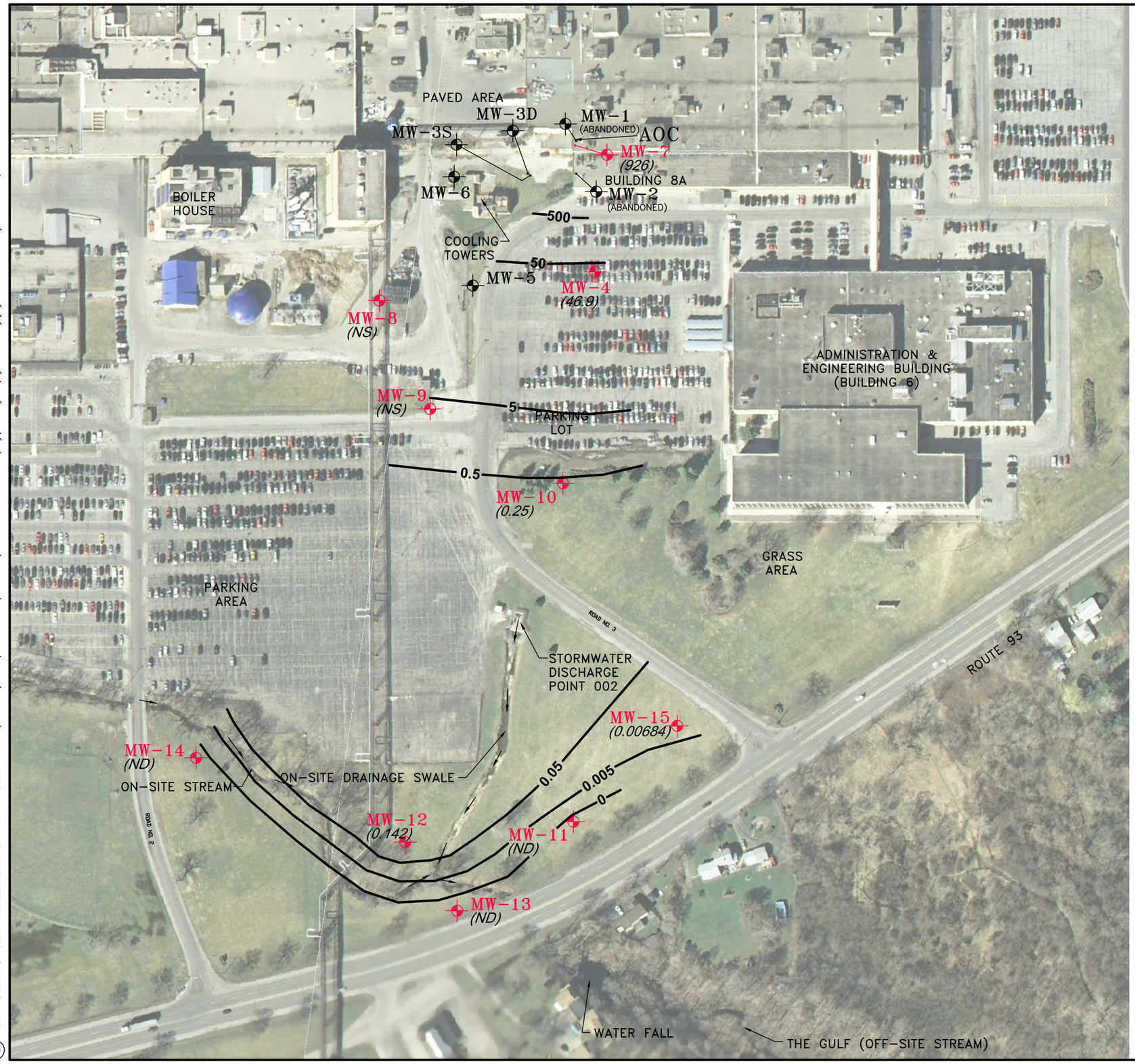
21.0056546.00

FIGURE No.

1

© 2014 GZA GeoEnvironmental of New York

GZA-K:\PROJECTS\56500s\56546 GM Component LLC\TCE Release Area MNA Sampling\2014 Figures\Figures 1-2.dwg [Figure 1 Analytical Results] December 22, 2014 - 11:50am daniel.wulf



NORTH

NOTES:

1. BASE MAP ADAPTED FROM A 2005 AERIAL PHOTOGRAPH DOWNLOADED FROM http://www.nysgis.state.ny.us/gateway/mg/interactive_main.html AND SITE OBSERVATIONS.

2. ANALYTICAL TESTING WAS COMPLETED BY TEST AMERICA LABORATORIES.

3. UNITS ARE LISTED IN MILLIGRAMS PER LITER (mg/l). (< - INDICATES COMPOUND NOT DETECTED ABOVE THE SPECIFIED DETECTION LIMIT)

4. THE SIZE AND LOCATION OF EXISTING SITE FEATURES SHOULD BE CONSIDERED APPROXIMATE.

LEGEND:

50 — APPROXIMATE LOCATION AND CONCENTRATION OF TOTAL VOC CONTOUR

MW-4 (46.9) — APPROXIMATE LOCATION AND DESIGNATION OF MONITORING WELL INSTALLED BY GZA SHOWN WITH TOTAL VOC CONCENTRATION

AOC — DENOTES AREA OF CONCERN

NS = NOT SAMPLED

DRAWN BY: MDK

DATE: DECEMBER 2014

GZA GeoEnvironmental of New York

APPROXIMATE SCALE IN FEET

0 90 180 360

GM COMPONENTS HOLDINGS, LLC

DELPHI HARRISON THERMAL SYSTEMS SITE

200 UPPER MOUNTAIN ROAD

LOCKPORT, NEW YORK

MAY 15, 2014 GROUNDWATER SAMPLING

TOTAL COC CONTOUR MAP

PROJECT No.

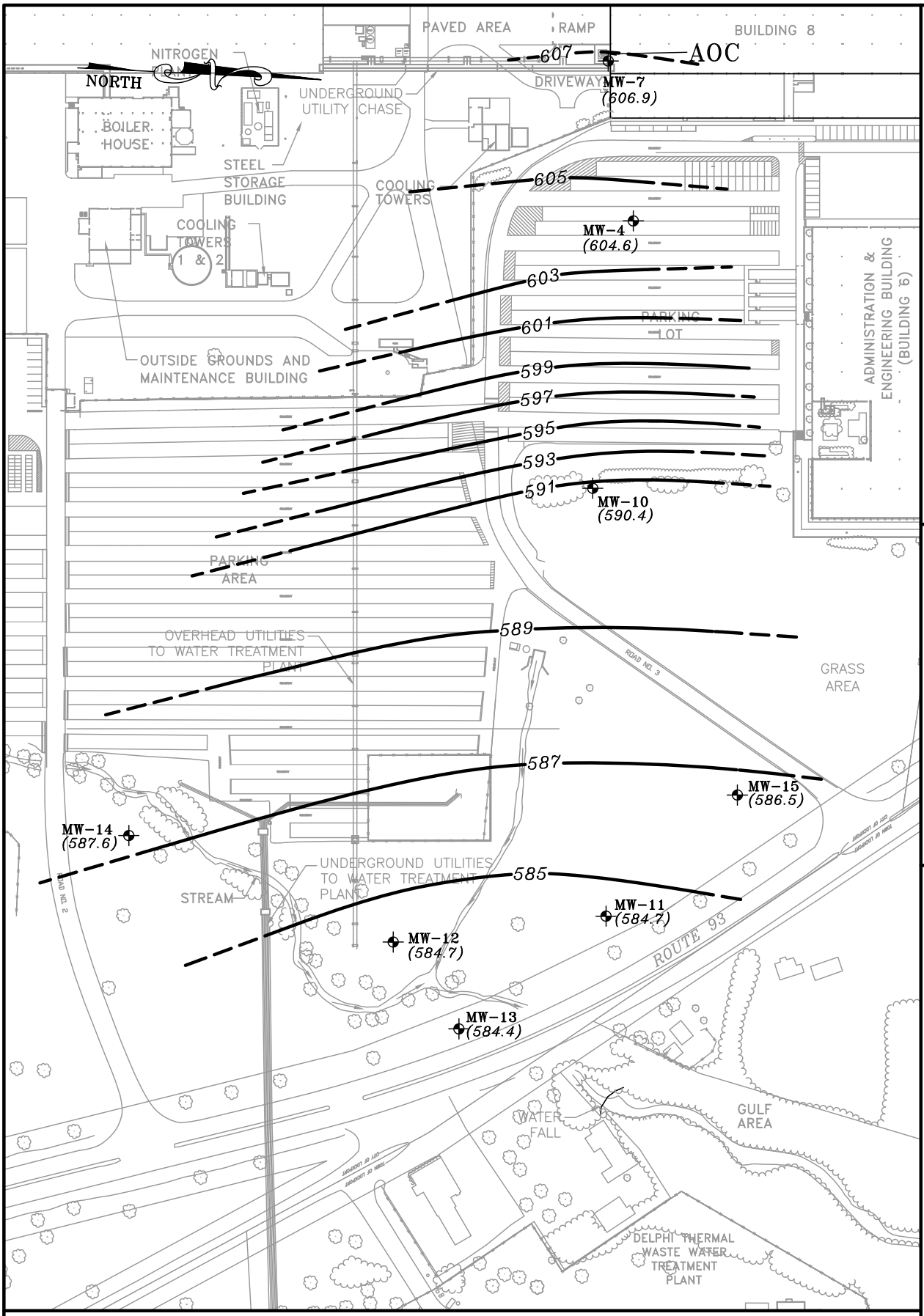
21.0056546.00

FIGURE No.

2

© 2014 GZA GeoEnvironmental of New York

GZA-K:\PROJECTS\56500s\56546 GM Component LLC\TCE Release Area MNA Sampling\2014 Figures\Figures 1-2.dwg [Figure 2 VOC Contours] December 22, 2014 - 11:51am daniel.wulf



LEGEND:

MW-4 (604.6) ⊕ APPROXIMATE LOCATION AND DESIGNATION OF EXISTING MONITORING WELL INSTALLED BY GZA

APPROXIMATE GROUNDWATER ELEVATION MEASURED ON DATE SHOWN IN TITLE BLOCK

AOC DENOTES AREA OF CONCERN

NOTES:

1. BASE MAP ADAPTED FROM AN AUTOCAD FILE PROVIDED BY DELPHI HARRISON THERMAL SYSTEMS.

2. WATER LEVEL READINGS HAVE BEEN MADE IN WELLS AT TIMES AND UNDER CONDITIONS PRESENTED IN THE REPORT. FLUCTUATIONS IN GROUNDWATER ELEVATIONS MAY OCCUR DUE TO VARIATIONS IN RAINFALL, BAROMETRIC PRESSURE, AND OTHER FACTORS.

DRAWN BY: MDK

DATE: DECEMBER 2013

GZA GeoEnvironmental of New York

SCALE IN FEET

0 100 200 400

GM COMPONENTS HOLDINGS, LLC

DELPHI HARRISON THERMAL SYSTEMS SITE

200 UPPER MOUNTAIN ROAD

LOCKPORT, NEW YORK

MAY 15, 2014 GROUNDWATER SAMPLING

GROUNDWATER ISOPOTENTIAL MAP

(MAY 15, 2014)

PROJECT No.

21.0056546.00

FIGURE No.

3

© 2014 GZA GeoEnvironmental of New York

GZA–K:\PROJECTS\56500s\56546 GM Component LLC\TCE Release Area MNA Sampling\2014 Figures\FIGURE 3 GW CONTOURS.dwg [FIGURE 3] December 22, 2014 – 11:49am daniel.wulf

APPENDIX A

MONITORING WELL OBSERVATION & GROUNDWATER SAMPLING LOGS

SAMPLE COLLECTION DATA SHEET - GROUNDWATER SAMPLING PROGRAM

PROJECT NAME Delphi Harrison Thermal Systems Site

PROJECT NO. 56546

SAMPLING CREW MEMBERS T. Bohlen

SUPERVISOR C. Boron

DATE OF SAMPLE COLLECTION 5/13/14 - 5/30/14

[Note: For 2" dia. well, 1 ft. = 0.14 gal (imp) or 0.16 gal (us)]

Sample I.D. Number	Well No.	Measuring Point Elev. (ft. AMSL)	Bottom Depth (ft. btoc)	Water Depth (ft. btoc)	Water Elevation (ft. AMSL)	Well Volume (gallons)	Bailer Volume No. Bails	Volume Purged (gallons)	Field pH	Field Temp.	Field Cond.	Time	Sample Description & Analysis
MW-4-051314	MW-4	613.07	34.88	8.51	604.56	4.3		4.3	6.92	14.6	6.83	1645	VOC, MNA, H_2
MW-10-051414	MW-10	604.70	23.65	14.34	590.36	1.5		1.5	6.85	13.2	8.37	955	VOC, MNA, H_2
MW-15-051914	MW-15	594.04	16.88	7.56	586.48	1.5		1.5	6.88	10.0	2.50	1015	VOC, MNA, H_2
MW-12-051914	MW-12	590.71	16.38	6.02	584.69	1.7		1.7	6.87	11.1	5.40	1440	VOC, MNA, H_2
MW-13-052014	MW-13	589.02	14.04	4.66	584.36	1.5		1.5	7.09	11.5	5.85	925	VOC, MNA, H_2
MW-11-052014	MW-11	590.10	25.14	5.42	584.68	3.2		3.4	7.41	9.6	1.31	1330	VOC MNA, H_2
MW-14-052314	MW-14	592.77	21.34	5.21	587.56	2.6		2.6	7.29	9.4	3.40	1055	VOC, MNA, H_2
MW-7-053014	MW-7	613.86	28.92	6.93	606.93	3.6		4.3	7.32	13.2	2.23	938	VOC, MNA

Additional Comments:

Copies to:

FMG MODIFICATIONS MUST BE ACCOMPANIED BY A REVISION REQUEST FORM APPROVED BY THE PROJECT MANAGER

[illegible]
Revision 1 October 29, 2002

• microseep
- start @ 1720
- End @ 1750

MONITORING WELL RECORD FOR LOW-FLOW PURGING

Project Data:

Project Name: Delphi Harrison
Ref. No.: 56546

Date: 5/13/14
Personnel: T. Bolden

Monitoring Well Data:

Well No.: MW-4
Measurement Point: TOR
Constructed Well Depth (ft): 30.5
Measured Well Depth (ft): 34.88
Depth of Sediment (ft):

Screen Length (ft): 17.5 - 30.5 = 15'
Depth to Pump Intake (ft)[1]: 30'
Well Diameter, D (in): 2"
Well Screen Volume, V_s (mL)[2]: 1 well vol = 4.3 gal.
Initial Depth to Water (ft): 8.51' TOR

Time	Pumping Rate (mL/min)	Depth to Water (ft)	Drawdown from Initial Water Level[3] (ft)	pH	Temperature °C	Conductivity (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Volume Purged, V_p ~~(mL)~~ gal	No. of Well ~~Screen~~ Volumes Purged[4]
1310	*66*	8.75		6.82	15.5	7.47	58.2	0.56	8.69	0	0
1345		9.13		6.87	15.1	7.45	19.5	0.17	10.73	0.3	0
1415		9.13		6.88	15.6	7.37	-18.4	0.12	6.11	1.0	0
1445		9.13		6.89	14.8	7.29	3.7	0.08	4.49	1.6	0
1515		9.13		6.90	14.8	7.09	5.5	0.07	3.48	2.2	0
1615		9.13		6.91	14.7	6.86	-35.2	0.05	1.95	3.4	0
1625		9.13		6.91	14.7	6.84	-24.6	0.04	1.93	3.8	0
1630		9.13		6.92	14.6	6.83	-23.0	0.04	1.93	3.9	0
1635		9.13		6.92	14.5	6.80	-22.5	0.04	1.91	4.0	0
1640		9.13		6.92	14.5	6.81	-21.3	0.04	1.95	4.2	0
1645	↓	9.13		6.92	14.6	6.83	-21.1	0.04	2.01	4.3	1

Notes:

(1) The pump intake will be placed at the well screen mid-point or at a minimum of 2 ft above any sediment accumulated at the well bottom.

(2) The well screen volume will be based on a 5-foot screen length. $V_s = p^*(D/2)^2*(5*12)*(2.54)^3$

(3) The drawdown from the initial water level should not exceed 0.3 ft.

(4) Purging will continue until stabilization is achieved or until 20 well screen volumes have been purged (unless purge water remains visually turbid and appears to be clearing, or unless stabilization parameters are varying slightly outside of the stablization criteria and appear to be stablizing). No. of Well Screen Volumes Purged= V_p/V_s.

OVM @ TOR = 31.8 ppm peak
*- calculated w/ 1L bottle & stopwatch. Slowest pump setting

FMG MODIFICATIONS MUST BE ACCOMPANIED BY A REVISION REQUEST FORM APPROVED BY THE PROJECT MANAGER

WELL PURGING FIELD INFORMATION FORM

JOB# 56546

SITE/PROJECT NAME: Delphi Harrison

WELL# MW-4

WELL PURGING INFORMATION

PURGE DATE (MM/DD/YY)	SAMPLE DATE (MM/DD/YY)	WATER VOL IN CASING (LITRES/GALLONS)	ACTUAL VOLUME PURGED (LITRES/GALLONS)
05/13/14	05/13/14	4.3	4.3

PURGING AND SAMPLING EQUIPMENT

PURGING EQUIPMENT DEDICATED Y (CIRCLE ONE) SAMPLING EQUIPMENT DEDICATED Y (CIRCLE ONE)

PURGING DEVICE	B	A - SUBMERSIBLE PUMP; B - PERISTALTIC PUMP; C - SCAMPER PUMP	D - GAS LIFT PUMP; E - PURGE PUMP; F - DIPPER SPIDER	G - BAILER; H - WATERRAY	X- (PURGING OTHER SPECIFY)
SAMPLING DEVICE	B	C - SCAMPER PUMP	F - DIPPER SPIDER		X- (SAMPLING OTHER SPECIFY)
PURGING DEVICE	E	A - TEFLON; B - STAINLESS STEEL; C - POLYPROPYLENE	D - PVC; E - POLYETHYLENE		X- (PURGING OTHER SPECIFY)
SAMPLING DEVICE	E	C - POLYPROPYLENE			X- (SAMPLING OTHER SPECIFY)
PURGING DEVICE	E	A - TEFLON; B - TEFLON; C - TEFLON	D - POLYPROPYLENE; E - POLYETHYLENE	F - SILICONE; G - COMBINATION TEFLON/POLYPROPYLENE	X- (PURGING OTHER SPECIFY)
SAMPLING DEVICE	E	C - TEFLON	X- (SPECIFY)		X- (SAMPLING OTHER SPECIFY)

FILTERING DEVICES 0.15 A - INLINE DISPOSABLE B - PRESSURE C - VACUUM

FIELD MEASUREMENTS

WELL ELEVATION	613.07 (m/ft)	GROUNDWATER ELEVATION	604.56 (m/ft)
DEPTH TO WATER	8.51 (m/ft)	WELL DEPTH	34.88 (m/ft)

pH	TURBIDITY	CONDUCTIVITY	ORP	DO	SAMPLE TEMPERATURE
(SU)	(ntu)	(µmhos/cm)	(mV)	(mg/L)	(°C)
(SU)	(ntu)	(µmhos/cm)	(mV)	(mg/L)	(°C)
(SU)	(ntu)	(µmhos/cm)	(mV)	(mg/L)	(°C)
(SU)	(ntu)	(µmhos/cm)	(mV)	(mg/L)	(°C)
(SU)	(ntu)	(µmhos/cm)	(mV)	(mg/L)	(°C)

FIELD COMMENTS

SAMPLE APPEARANCE: Slightly Solvent ODOR: Clear COLOR: Clear TURBIDITY: Clear

WEATHER CONDITIONS: WINDSPEED 15 DIRECTION SW PRECIPITATION Y (CIRCLE ONE) pm-Clear

SPECIFIC COMMENTS

I CERTIFY THAT SAMPLING WAS CONDUCTED IN ACCORDANCE WITH ALL SAMPLING PROTOCOLS

5/13/14 Thomas Bohlen Thomas Bohlen

DATE PRINT SIGNATURE

EMG MODIFICATIONS MUST BE ACCOMPANIED BY A REVISION REQUEST FORM AFFROVED BY THE PROJECT MANAGER

MONITORING WELL RECORD FOR LOW-FLOW PURGING

Project Data:

Project Name: GMCH Delphi
Ref. No.: 56546

Date: 5/29/14
Personnel: T. Bohlen

Monitoring Well Data:

Well No.: MW-7
Measurement Point: TOR
Constructed Well Depth (ft): 27.20
Measured Well Depth (ft): 28.92
Depth of Sediment (ft):

Screen Length (ft): 12.2-27.2 = 15'
Depth to Pump Intake (ft)[1]: 22'
Well Diameter, D (in): 2"
Well ~~Screen~~ Volume, V_s ~~(mL)~~[2]: 1 well vol = 3.6 gal.
Initial Depth to Water (ft): 6.93

	Time	Pumping Rate (mL/min)	Depth to Water (ft)	Drawdown from Initial Water Level[3] (ft)	pH	Temperature °C	Conductivity (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Volume Purged, V_p (mL)	No. of Well Screen Volumes Purged[4]
	900		7.20		7.72	13.4	2.35	164.1	0.65	4.34	0	0
	905		10.39		7.31	13.0	2.32	141.4	0.38	3.53	0.7	0
5/29	910		12.43		7.31	13.0	2.30	95.4	0.22	3.04	1.2	0
	915		14.93		7.31	12.9	2.21	33.6	0.21	5.15	2.0	0
	920		16.72		7.31	12.8	2.11	7.4	0.39	10.34	2.6	0
	925		18.54		7.33	12.9	2.04	-4.7	1.86	10.41	3.2	0
	930		20.00		7.31	13.0	2.16	-10.6	1.18	27.0	3.8	1
	935		21.34		7.31	13.2	2.21	-10.6	1.76	28.4	4.2	1
	938	Dry	22.00		7.32	13.2	2.23	-10.7	1.78	28.1	4.3	1
5/30	1230		7.14									
			↳ sampled									

Notes:

(1) The pump intake will be placed at the well screen mid-point or at a minimum of 2 ft above any sediment accumulated at the well bottom.

(2) The well screen volume will be based on a 5-foot screen length. $V_s = p*(D/2)^2*(5*12)*(2.54)^3$

(3) The drawdown from the initial water level should not exceed 0.3 ft.

(4) Purging will continue until stabilization is achieved or until 20 well screen volumes have been purged (unless purge water remains visually turbid and appears to be clearing, or unless stabilization parameters are varying slightly outside of the stablization criteria and appear to be stablizing). No. of Well Screen Volumes Purged= Vp/Vs.

OVM = 103 ppm peak @ TOR
0.0 ppm - 6" above TOR

FMG MODIFICATIONS MUST BE ACCOMPANIED BY A REVISION REQUEST FORM APPROVED BY THE PROJECT MANAGER

WELL PURGING FIELD INFORMATION FORM

JOB# 56546

SITE/PROJECT NAME: GMCH Delphi

WELL# MW-7

WELL PURGING INFORMATION

PURGE DATE (MM DD YY)	SAMPLE DATE (MM DD YY)	WATER VOL IN CASING (LITRES/GALLONS)	ACTUAL VOLUME PURGED (LITRES/GALLONS)
052914	053014	36	43

PURGING AND SAMPLING EQUIPMENT

PURGING EQUIPMENT DEDICATED 0 (CIRCLE ONE) SAMPLING EQUIPMENT DEDICATED 0 (CIRCLE ONE)

PURGING DEVICE	B	A - SUBMERSIBLE PUMP; B - PERISTALTIC PUMP; C - BAILER; D - PUSH-BELT PUMP; E - PUSH-BELT PUMP; F - DIPPER BOTTLE; G - BAILER; H - WATERRAIL			N= PURGING OTHER (SPECIFY)
SAMPLING DEVICE	B	A - BLADDER PUMP; B - DIPPER BOTTLE			N= SAMPLING OTHER (SPECIFY)
PURGING DEVICE	E	A - TEFLON; B - STAINLESS STEEL; C - POLYETHYLENE			N= PURGING OTHER (SPECIFY)
SAMPLING DEVICE	E	A - POLYETHYLENE			N= SAMPLING OTHER (SPECIFY)
PURGING DEVICE	E	A - TEFLON; B - TEFLON; C - POLYETHYLENE; D - POLYETHYLENE; E - SILICONE; F - POLYETHYLENE; G - COMBINATION TEFLON/POLYPROPYLENE			N= PURGING OTHER (SPECIFY)
SAMPLING DEVICE	E	A - TEFLON; B - TEFLON; C - POLYETHYLENE; D - POLYETHYLENE; E - SILICONE; F - POLYETHYLENE; G - COMBINATION TEFLON/POLYPROPYLENE			N= SAMPLING OTHER (SPECIFY)

FILTERING DEVICES 0-15 A - INLINE DISPOSABLE B - PRESSURE C - VACUUM

FIELD MEASUREMENTS

WELL ELEVATION	61386 (m/ft)	GROUNDWATER ELEVATION	60693 (m/ft)
DEPTH TO WATER	693 (m/ft)	WELL DEPTH	2892 (m/ft)

pH	TURBIDITY	CONDUCTIVITY	ORP	DO	SAMPLE TEMPERATURE

FIELD COMMENTS

SAMPLE APPEARANCE Good ODOR solvent COLOR Clear FIELD DO Clear

WEATHER CONDITIONS WIND SPEED 0-5 DIRECTION SW PRECIPITATION 0 DISTURBED

SPECIFIC COMMENTS

Sheen observed

PURGED BY THE SAMPLING DEVICE OR SAMPLING WITHIN WORKING WITH APPLICABLE SAMPLING PROTOCOLS

5/30/14 Thomas Bohlen Thomas Bohlen

DATE NAME SIGNATURE

PARAMETER DEVIATIONS MUST BE ACCOMPANIED BY A REVISION REQUEST FORM APPROVED BY THE PROJECT MANAGER

Microscop
start @ 1025
End @ 1055

MONITORING WELL RECORD FOR LOW-FLOW PURGING

Project Data:

Project Name: Delphi Harrison
Ref. No.: 56546.00

Date: 5/14/14
Personnel: T. Bohlen

Monitoring Well Data:

Well No.: MW-10
Measurement Point: TOR
Constructed Well Depth (ft): 21.3
Measured Well Depth (ft): 23.65
Depth of Sediment (ft):

Screen Length (ft): 8.8'
Depth to Pump Intake (ft)[1]: 19'
Well Diameter, D (in): 2
Well ~~Screen~~ Volume, V_s ~~(mL)~~ gal[2]: 1.5 gal.
Initial Depth to Water (ft): 14.34

Time	Pumping Rate (mL/min)	Depth to Water (ft)	Drawdown from Initial Water Level[3] (ft)	pH	Temperature °C	Conductivity (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Volume Purged, V_p (mL)	No. of Well Screen Volumes Purged[4]
830	*71*	14.60		6.76	13.5	7.50	208.7	0.62	3.67	0	0
835		14.60		6.82	13.4	7.76	184.4	0.29	3.25	0.1	0
840		14.60		6.83	13.3	7.78	174.4	0.26	3.15	0.2	0
850		14.60		6.83	13.1	7.90	159.1	0.20	0.89	0.3	0
900		14.60		6.84	13.2	8.06	142.0	0.16	0.85	0.4	0
910		14.60		6.84	13.1	8.22	130.3	0.11	0.81	0.6	0
920		14.60		6.85	13.2	8.29	120.0	0.11	1.35	0.8	0
930		14.60		6.85	13.1	8.28	110.4	0.09	1.30	1.0	0
940		14.60		6.85	13.2	8.30	104.6	0.10	1.31	1.2	0
945		14.60		6.85	13.2	8.31	103.3	0.11	1.25	1.3	0
950		14.60		6.85	13.2	8.35	103.8	0.11	1.20	1.4	0
955		14.60		6.85	13.2	8.37	105.7	0.10	1.31	1.5	1

Notes:

(1) The pump intake will be placed at the well screen mid-point or at a minimum of 2 ft above any sediment accumulated at the well bottom.

(2) The well screen volume will be based on a 5-foot screen length. $V_s = p*(D/2)^2*(5*12)*(2.54)^3$

(3) The drawdown from the initial water level should not exceed 0.3 ft.

(4) Purging will continue until stabilization is achieved or until 20 well screen volumes have been purged (unless purge water remains visually turbid and appears to be clearing, or unless stabilization parameters are varying slightly outside of the stablization criteria and appear to be stablizing), No. of Well Screen Volumes Purged= Vp/Vs.

*Calculated w/ Stopwatch & 1L Bottle.

OVM @ TOR: 0.0ppm

FMG MODIFICATIONS MUST BE ACCOMPANIED BY A REVISION REQUEST FORM APPROVED BY THE PROJECT MANAGER

WELL PURGING FIELD INFORMATION FORM

JOB# 56546

SITE/PROJECT NAME: Delphi Harrison

WELL# MW-10

WELL PURGING INFORMATION

PURGE DATE (MM DD YY)	SAMPLE DATE (MM DD YY)	WATER VOL. IN CASING (LITERS/GALLONS)	ACTUAL VOL. PURGED (LITERS/GALLONS)
051414	051414	1.5	1.5

PURGING AND SAMPLING EQUIPMENT

PURGING EQUIPMENT DEDICATED (Y) N (CIRCLE ONE) SAMPLING EQIPMENT DEDICATED (Y) N (CIRCLE ONE)

PURGING DEVICE	B	A - SUBMERSIBLE PUMP B - PERISTALTIC PUMP C - BLADDER PUMP	D - GAS LIFT PUMP E - PURGE PUMP F - FILTER SOTTLE	G - FILTER H - WATER BAR	X - PURGING OTHER (SPECIFY)
SAMPLING DEVICE	B	A - SUBMERSIBLE PUMP B - PERISTALTIC PUMP C - BLADDER PUMP	D - GAS LIFT PUMP E - PURGE PUMP F - FILTER SOTTLE		X - SAMPLING OTHER (SPECIFY)
PURGING DEVICE	E	A - TEFLON B - STAINLESS STEEL C - POLYPROPYLENE	D - PVC E - POLYETHYLENE		X - PURGING OTHER (SPECIFY)
SAMPLING DEVICE	E	A - POLYPROPYLENE			X - SAMPLING OTHER (SPECIFY)
PURGING DEVICE	E	A - TEFLON B - TYGON C - TRIPLE	D - POLYPROPYLENE E - POLYETHYLENE	F - SILICONE G - COMBINATION TEFLON/POLYPROPYLENE	X - PURGING OTHER (SPECIFY)
SAMPLING DEVICE	E	C - TRIPLE	X - (SPECIFY)		X - SAMPLING OTHER (SPECIFY)

FILTERING DEVICES 0.45 [ ] A - IN-LINE DISPOSABLE B - PRESSURE C - VACUUM

FIELD MEASUREMENTS

WELL ELEVATION	604.70 (in/ft)	GROUNDWATER ELEVATION	590.36 (in/ft)
DEPTH TO WATER	14.34 (in/ft)	WELL DEPTH	23.65 (in/ft)

pH	TURBIDITY	CONDUCTIVITY	ORP	DO	SAMPLE TEMPERATURE
(std)	(ntu)	(µmhos/cm)	(mV)		
(std)	(ntu)	(µmhos/cm)	(mV)		
(std)	(ntu)	(µmhos/cm)	(mV)		
(std)	(ntu)	(µmhos/cm)	(mV)		
(std)	(ntu)	(µmhos/cm)	(mV)		

FIELD COMMENTS

SAMPLE APPEARANCE Good TIME none COLOR Clear TURBIDITY Clear

WEATHER CONDITIONS WIND SPEED 0-5 DIRECTION SW PRECIPITATION 0 OUTDOOR Showers forcasted

SPECIFIC COMMENTS

DURING THIS SAMPLING EVENT, WELL WAS SAMPLED IN CONFORMANCE WITH APPLICABLE SAMPLING PROCEDURES

DATE	PRINT	SIGNATURE
5/14/14	Thomas Bohlen	Thomas Bohlen

FMG MODIFICATIONS MUST BE ACCOMPANIED BY A REVISION REQUEST FORM APPROVED BY THE PROJECT MANAGER

MONITORING WELL RECORD FOR LOW-FLOW PURGING

Project Data:

Project Name: Delphi Harrison
Ref. No.: 56.546.00

Date: 5/20/14
Personnel: T. Bohlen

Monitoring Well Data:

Well No.: MW-11
Measurement Point: TOR
Constructed Well Depth (ft): 24.10
Measured Well Depth (ft): 25.14
Depth of Sediment (ft):

Screen Length (ft): 9-21.4 (15.1')
Depth to Pump Intake (ft)[1]: 15
Well Diameter, D (in): 2
Well ~~Screen~~ Volume, V_s ~~(mL)~~[2]: 1 well vol = 3.2 gallons
Initial Depth to Water (ft): 5.42

Time	Pumping Rate (mL/min)	Depth to Water (ft)	Drawdown from Initial Water Level[3] (ft)	pH	Temperature °C	Conductivity (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Volume Purged, V_p (mL)	No. of Well Screen Volumes Purged[4]
1045	* 80	5.61		7.58	11.1	1.37	101.8	0.82	2.40	0	0
1103		5.76		7.47	10.0	1.31	85.1	0.18	2.31	0.2	0
1133		5.76		7.44	9.9	1.30	-18.2	0.10	1.78	0.9	0
1200		5.76		7.50	10.0	1.33	-89.9	0.09	1.35	1.5	0
1230		5.76		7.48	9.9	1.33	-95.2	0.15	1.27	2.1	0
1300		5.76		7.44	9.7	1.32	-81.3	0.40	1.15	2.9	0
1315		5.76		7.42	9.5	1.32	-74.8	0.50	1.10	3.1	0
1320		5.76		7.41	9.5	1.31	-72.7	0.62	1.15	3.2	1
1325		5.76		7.41	9.6	1.31	-71.5	0.65	1.15	3.3	1
1330	↓	5.76		7.41	9.6	1.31	-72.6	0.64	1.17	3.4	1

Notes:

(1) The pump intake will be placed at the well screen mid-point or at a minimum of 2 ft above any sediment accumulated at the well bottom.

(2) The well screen volume will be based on a 5-foot screen length. $V_s = \pi^*(D/2)^{2*}(5*12)^*(2.54)^3$

(3) The drawdown from the initial water level should not exceed 0.3 ft.

(4) Purging will continue until stabilization is achieved or until 20 well screen volumes have been purged (unless purge water remains visually turbid and appears to be clearing, or unless stabilization parameters are varying slightly outside of the stablization criteria and appear to be stablizing). No. of Well Screen Volumes Purged= Vp/Vs.

* calculated w/ stopwatch & 1L Bottle

OVM @ TOR = 0.0 ppm

FMG MODIFICATIONS MUST BE ACCOMPANIED BY A REVISION REQUEST FORM APPROVED BY THE PROJECT MANAGER

WELL PURGING FIELD INFORMATION FORM

JOB# 56546

SITE/PROJECT NAME: Delphi Harrison

WELL# MW-11

WELL PURGING INFORMATION

PURGE DATE (MM DD YY)	SAMPLE DATE (MM DD YY)	WATER VOL. PRE-PURGING (LITERS/GALLONS)	WATER VOL. PRE-PURGING (LITERS/GALLONS)
052014	052014	3.2	3.4

PURGING AND SAMPLING EQUIPMENT

PURGING EQUIPMENT DEDICATED ✓ (CIRCLE ONE) SAMPLING EQUIPMENT DEDICATED ✓ (CIRCLE ONE)

PURGING DEVICE	B	A-GEOMETRIC PUMP; B-GEOTEST PUMP; C-FAULTY PUMP; D-FAULTY PUMP; E-FAULTY PUMP; F-FAULTY PUMP; G-FAULTY PUMP; H-WATERRAP			X= PURGING OTHER (SPECIFY)
SAMPLING DEVICE	B	A-BLADDER PUMP; B-BLADDER PUMP; C-BLADDER PUMP; D-BLADDER PUMP; E-BLADDER PUMP; F-BLADDER PUMP; G-BLADDER PUMP			X= SAMPLING OTHER (SPECIFY)
PURGING DEVICE	E	A-TEFLON; B-STAINLESS STEEL; C-POLYETHYLENE; D-POLYPROPYLENE			X= PURGING OTHER (SPECIFY)
SAMPLING DEVICE	E	A-TEFLON; B-POLYPROPYLENE; C-POLYETHYLENE			X= SAMPLING OTHER (SPECIFY)
PURGING DEVICE	E	A-TEFLON; B-TEFLON; C-TEFLON; D-POLYETHYLENE; E-POLYETHYLENE; F-SILICONE; G-COMBINATION TEFLON/POLYPROPYLENE			X= PURGING OTHER (SPECIFY)
SAMPLING DEVICE	E	A-TEFLON; B-TEFLON; C-TEFLON; D-TEFLON; E-TEFLON; F-TEFLON; G-COMBINATION TEFLON/POLYPROPYLENE			X= SAMPLING OTHER (SPECIFY)

FILTERING DEVICES 0.15 A-IN LINE DISPOSABLE B-PRESSURE C-VACUUM

FIELD MEASUREMENTS

WELL ELEVATION	590.10 (m/ft)	GROUNDWATER ELEVATION	584.68 (m/ft)
DEPTH TO WATER	5.42 (m/ft)	WELL DEPTH	25.14 (m/ft)

pH	TURBIDITY	CONDUCTIVITY	ORP	DO	SAMPLE TEMPERATURE
(std)	(ntu)	(µmhos/cm)	(mV)		(°C)
(std)	(ntu)	(µmhos/cm)	(mV)		(°C)
(std)	(ntu)	(µmhos/cm)	(mV)		(°C)
(std)	(ntu)	(µmhos/cm)	(mV)		(°C)
(std)	(ntu)	(µmhos/cm)	(mV)		(°C)

FIELD COMMENTS

SAMPLE ACTIVITY: Good DOC: None COLOR: Clear TOTAL: Clear

WEATHER CONDITIONS: WIND SPEED 0-5 DIRECTION W PRECIPITATION ✓ CONTENT: showers forecasted pm

SPECIFIC COMMENTS

I CERTIFY THAT SAMPLE ACTIVITY CHECKS OTHER IN WORK ONCE WITH ALL PROJECT PROTOCOLS

5/20/14 Thomas Bohlen Thomas Bohlen

DATE PRINT SIGNATURE

FMG MODIFICATIONS MUST BE ACCOMPANIED BY A REVISION REQUEST FORM AT PROVED BY THE PROJECT MANAGER

microseeps ran: 1447
1517

MONITORING WELL RECORD FOR LOW-FLOW PURGING

Project Data:

Project Name: Delphi Harrison
Ref. No.: 56546

Date: 5/19/04
Personnel: VBohlen

Monitoring Well Data:

Well No.: MW-12
Measurement Point: TOR
Constructed Well Depth (ft): 15.1
Measured Well Depth (ft): 16.38
Depth of Sediment (ft):

Screen Length (ft): 7.1
Depth to Pump Intake (ft)[1]: 14
Well Diameter, D (in): 2
Well Screen Volume, V_s (mL)[2]: 1 well vol. = 1.7 gallons
Initial Depth to Water (ft): 6.02

Time	Pumping Rate (mL/min)	Depth to Water (ft)	Drawdown from Initial Water Level[3] (ft)	pH	Temperature °C	Conductivity (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Volume Purged, Vp (mL)	No. of Well Screen Volumes Purged[4]
1252	*66*	6.17		6.90	12.1	5.91	142.2	0.74	12.54	0	0
1322		6.24		6.83	10.7	5.83	97.9	0.17	6.48	0.2	0
1345		6.24		6.84	10.8	5.60	3.6	0.12	5.21	0.8	0
1405		6.24		6.84	11.1	5.49	-28.5	0.10	4.83	1.1	0
1425		6.24		6.86	11.1	5.43	-38.1	0.11	4.71	1.4	0
1435		6.24		6.87	11.1	5.41	-40.5	0.11	4.70	1.7	1
1440		6.24		6.87	11.1	5.40	-41.2	0.11	4.65	1.8	1

Notes:

(1) The pump intake will be placed at the well screen mid-point or at a minimum of 2 ft above any sediment accumulated at the well bottom.

(2) The well screen volume will be based on a 5-foot screen length. $V_s = p*(D/2)^2*(5*12)*(2.54)^3$

(3) The drawdown from the initial water level should not exceed 0.3 ft.

(4) Purging will continue until stabilization is achieved or until 20 well screen volumes have been purged (unless purge water remains visually turbid and appears to be clearing, or unless stabilization parameters are varying slightly outside of the stablization criteria and appear to be stablizing). No. of Well Screen Volumes Purged= Vp/Vs.

* calculated using stopwatch & 1L bottle

OVM @ TOR = 0.0 ppm

FMG MODIFICATIONS MUST BE ACCOMPANIED BY A REVISION REQUEST FORM APPROVED BY THE PROJECT MANAGER

WELL PURGING FIELD INFORMATION FORM

JOB# 56546

SITE/PROJECT NAME: Delphi Harrison

WELL# MW-12

WELL PURGING INFORMATION

PURGE DATE (MM DD YY)	SAMPLE DATE (MM DD YY)	WATER VOL IN CASING (LITRES/GALLONS)	ACTUAL VOLUME PURGED (LITRES/GALLONS)
05/19/14	05/19/14	1.7	1.8

PURGING AND SAMPLING EQUIPMENT

PURGING EQUIPMENT DEDICATED 0 (CIRCLE ONE) SAMPLING EQUIPMENT DEDICATED 0 (CIRCLE ONE)

PURGING DEVICE	B	A. SUBMERSIBLE PUMP	B. PERISTALTIC PUMP	C. BAILER	X-
		D. SUBMERSIBLE PUMP	E. PURGE PUMP	F. WATERRAIL	PURGING OTHER (SPECIFY)
SAMPLING DEVICE	B	A. BLADDER PUMP	B. DIPPER BOTTLE		X-
					SAMPLING OTHER (SPECIFY)
PURGING DEVICE	E	A. TEFLON	B. PVC		X-
		D. STAINLESS STEEL	E. POLYETHYLENE		PURGING OTHER (SPECIFY)
SAMPLING DEVICE	E	C. POLYPROPYLENE			X-
					SAMPLING OTHER (SPECIFY)
PURGING DEVICE	E	A. TEFLON	B. POLYPROPYLENE	C. SILICONE	X-
		D. TEFLON	E. POLYETHYLENE	F. COMBINATION	PURGING OTHER (SPECIFY)
SAMPLING DEVICE	E	C. TEFLON	X-	TEFLON/POLYPROPYLENE	X-
			(SPECIFY)		SAMPLING OTHER (SPECIFY)

FILTERING DEVICES 0-15 A. IN-LINE DISPOSABLE B. PRESSURE C. VACUUM

FIELD MEASUREMENTS

WELL ELEVATION	590.71 (m/ft)	GROUNDWATER ELEVATION	584.69 (m/ft)
DEPTH TO WATER	6.02 (m/ft)	WELL DEPTH	16.38 (m/ft)

pH	TURBIDITY	CONDUCTIVITY	ORP	DO	SAMPLE TEMPERATURE
(std)	(ntu)	(µmhos/cm)	(mV)	(mg/l)	(°C)
(std)	(ntu)	(µmhos/cm)	(mV)	(mg/l)	(°C)
(std)	(ntu)	(µmhos/cm)	(mV)	(mg/l)	(°C)
(std)	(ntu)	(µmhos/cm)	(mV)	(mg/l)	(°C)
(std)	(ntu)	(µmhos/cm)	(mV)	(mg/l)	(°C)

FIELD COMMENTS

SAMPLE ACTIVITY ACT Good (CIRCLE) none (CIRCLE) Clear (CIRCLE) Clear

WEATHER CONDITIONS WIND SPEED 0-5 DIRECTION SW PRECIPITATION 0 (CIRCLE) showers forcasted

SPECIFIC COMMENTS

I HEREBY THIS SAMPLING IS CONDUCTED IN ACCORDANCE WITH APPLICABLE METHODS

5/19/14 Thomas Bohlen Thomas Bohlen

DATE PRINT SIGNATURE

FMG MODIFICATIONS MUST BE ACCOMPANIED BY A REVISION REQUEST FORM AS PROVED BY THE PROJECT MANAGER

microseep from 927 to 957

MONITORING WELL RECORD FOR LOW-FLOW PURGING

Project Data:

Project Name: Delphi Harrison
Ref. No.: 56546

Date: 5/20/14
Personnel: T. Bohlen

Monitoring Well Data:

Well No.: MW-13
Measurement Point: TOR
Constructed Well Depth (ft): 15'
Measured Well Depth (ft): 14.04
Depth of Sediment (ft):

Screen Length (ft): 7'
Depth to Pump Intake (ft)[1]: 12'
Well Diameter, D (in): 2"
Well ~~Screen~~ Volume, V_s ~~(mL)~~[2]: 1 well vol. = 1.5 gal
Initial Depth to Water (ft): 4.66

Time	Pumping Rate (mL/min)	Depth to Water (ft)	Drawdown from Initial Water Level[3] (ft)	pH	Temperature °C	Conductivity (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Volume Purged, Vp (mL)	No. of Well Screen Volumes Purged[4]
817	*79	4.71		7.15	11.7	6.68	-58.1	1.08	17.5	0	0
843		4.75		7.17	11.5	6.42	-108.2	0.16	20.8	0.3	0
900		4.75		7.12	11.5	5.74	-82.4	0.22	21.6	0.9	0
910		4.75		7.09	11.5	5.77	-77.5	0.25	15.6	1.2	0
915		4.75		7.09	11.5	5.80	-79.1	0.25	11.3	1.3	0
920		4.75		7.09	11.5	5.84	-81.8	0.24	10.9	1.4	0
925		4.75		7.09	11.5	5.85	-82.1	0.24	10.7	1.5	1

Notes:

(1) The pump intake will be placed at the well screen mid-point or at a minimum of 2 ft above any sediment accumulated at the well bottom.

(2) The well screen volume will be based on a 5-foot screen length. $V_s = p*(D/2)^2*(5*12)*(2.54)^3$

(3) The drawdown from the initial water level should not exceed 0.3 ft.

(4) Purging will continue until stabilization is achieved or until 20 well screen volumes have been purged (unless purge water remains visually turbid and appears to be clearing, or unless stabilization parameters are varying slightly outside of the stablization criteria and appear to be stablizing), No. of Well Screen Volumes Purged= Vp/Vs.

* - Calculated using stop watch & 1L bottle

OVM @ TOR = 0.0 ppm

FMG MODIFICATIONS MUST BE ACCOMPANIED BY A REVISION REQUEST FORM APPROVED BY THE PROJECT MANAGER

WELL PURGING FIELD INFORMATION FORM

JOB# 5 6 5 4 6 - [ ] [ ]

SITE/PROJECT NAME: Delphi Harrison

WELL# M M - 1 3 [ ] [ ]

WELL PURGING INFORMATION

PURGE DATE	SAMPLE DATE	WATER LEVEL BEFORE SAMPLING	WATER LEVEL AFTER SAMPLING
0 5 2 0 1 4	0 5 2 0 1 4	1 5	1 5

PURGING AND SAMPLING EQUIPMENT

PURGING EQUIPMENT DEDICATED? O (Y/N)

SAMPLING EQUIPMENT DEDICATED? O (Y/N)

PURGING DEVICE	B	B = BLADDER PUMP; D = DISPOSABLE BAILER; F = FAUCET; G = GRAB; O = OTHER (SPECIFY); P = PERISTALTIC PUMP; SM = SUBMERSIBLE PUMP; W = WATERRA	X =
SAMPLING DEVICE	B		X =
PURGING DEVICE	E		X =
SAMPLING DEVICE	E		X =
PURGING DEVICE	E	B = BLADDER; E = ELECTRIC SUBMERSIBLE; P = PERISTALTIC; S = SUBMERSIBLE;	X =
SAMPLING DEVICE	E		X =

FILTERING DEVICES (Y/N) [ ] IF FILTERED, # PASSES: CONTAINER VOLUME:

FIELD MEASUREMENTS

WELL ELEVATION	5 8 9 0 2 (msl, ft)	GROUNDWATER ELEVATION	5 8 4 3 6 (msl, ft)
DEPTH TO WATER	4 6 6 (nearest 0.01 ft)	WELL DEPTH	1 4 0 4 (nearest 0.01 ft)

pH	TURBIDITY	CONDUCTIVITY	ORP	DO	SAMPLE TEMPERATURE

FIELD COMMENTS

SAMPLE APPEARANCE: Good ODOR: none PURGE WATER: clear FILTER #: Clear

WEATHER CONDITIONS: WIND SPEED: 5-10 WIND DIR: SW PRECIPITATION (Y/N): O AMBIENT AIR:

SPECIFIC COMMENTS

5/20/14 Thomas Bohlen Thomas Bohlen

(DATE) (PRINT NAME) (SIGNATURE)

PAGE ___ OF ___ DUPLICATE SAMPLES? (Y/N) IF YES, SEPARATELY ANALYSIS REQUEST FORM WITH PROPER QA/QC CODE

Microseeps ran from 11:00 - 11:30

MONITORING WELL RECORD FOR LOW-FLOW PURGING

Project Data:

Project Name: Delphi Harrison
Ref. No.: 56546

Date: 5/23/14
Personnel: T. Bahlen

Monitoring Well Data:

Well No.: MW-14
Measurement Point: TOR
Constructed Well Depth (ft): 19.1
Measured Well Depth (ft): 21.34
Depth of Sediment (ft):

Screen Length (ft): 9.1 - 19.1 = 10'
Depth to Pump Intake (ft)[1]: 17'
Well Diameter, D (in): 2"
Well ~~Screen~~ Volume, V_s ~~(mL)~~[2]: 1 well vol. = 2.6 gal.
Initial Depth to Water (ft): 5.21

Time	Pumping Rate (mL/min)	Depth to Water (ft)	Drawdown from Initial Water Level[3] (ft)	pH	Temperature °C	Conductivity (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Volume Purged, V_p (mL)	No. of Well Screen Volumes Purged[4]
817	*66*	5.73		7.31	10.0	3.08	158.0	0.69	1.85	0	0
850		6.87		7.27	9.8	3.13	88.6	0.13	1.97	0.5	0
920		6.87		7.28	9.5	3.39	71.4	0.09	1.58	1.0	0
950		6.87		7.28	9.5	3.39	48.0	0.09	1.31	1.6	0
1020		6.87		7.29	9.4	3.38	31.7	0.06	0.84	2.1	0
1035		6.87		7.29	9.4	3.40	26.8	0.07	0.79	2.2	0
1045		6.87		7.29	9.4	3.39	24.5	0.07	0.75	2.4	0
1050		6.87		7.29	9.4	3.40	23.4	0.07	0.72	2.5	0
1055		6.87		7.29	9.4	3.40	22.7	0.07	0.78	2.6	1

Notes:

(1) The pump intake will be placed at the well screen mid-point or at a minimum of 2 ft above any sediment accumulated at the well bottom.

(2) The well screen volume will be based on a 5-foot screen length. $V_s = p*(D/2)^2*(5*12)*(2.54)^3$

(3) The drawdown from the initial water level should not exceed 0.3 ft.

(4) Purging will continue until stabilization is achieved or until 20 well screen volumes have been purged (unless purge water remains visually turbid and appears to be clearing, or unless stabilization parameters are varying slightly outside of the stablization criteria and appear to be stablizing). No. of Well Screen Volumes Purged= Vp/Vs.

* calculated using a 1L Bottle & Stop watch

OVM = 0.0ppm @ TOR

FMG MODIFICATIONS MUST BE ACCOMPANIED BY A REVISION REQUEST FORM APPROVED BY THE PROJECT MANAGER

WELL PURGING FIELD INFORMATION FORM

JOB# 56546

SITE/PROJECT NAME: Delphi Harrison

WELL# MW-14

WELL PURGING INFORMATION

PURGE DATE (MM/DD/YY)	SAMPLE DATE (MM/DD/YY)	WATER VOL. IN CASING (LITERS/GALLONS)	ACTUAL VOL. PURGED (LITERS/GALLONS)
052314	052314	2.6	2.6

PURGING AND SAMPLING EQUIPMENT

PURGING EQUIPMENT DEDICATED Y N (CIRCLE ONE) SAMPLING EQUIPMENT DEDICATED Y N (CIRCLE ONE)

PURGING DEVICE B — A - SUBMERSIBLE PUMP; B - PERISTALTIC PUMP; C - BAILER; D - PUMP; E - PUMP; F - PUMP; G - WATERRAIL; H - WATERRAIL; X- PURGING OTHER (SPECIFY)

SAMPLING DEVICE B — A - SUBMERSIBLE PUMP; B - PERISTALTIC PUMP; C - BAILER; D - PUMP; E - BAILER; F - BAILER; X- SAMPLING OTHER (SPECIFY)

PURGING DEVICE E — A - TEFLON; B - STAINLESS STEEL; C - POLYETHYLENE; D - PVC; E - POLYETHYLENE; X- PURGING OTHER (SPECIFY)

SAMPLING DEVICE E — A - POLYPROPYLENE; X- SAMPLING OTHER (SPECIFY)

PURGING DEVICE E — A - TEFLON; B - TEFLON; C - POLYETHYLENE; D - POLYETHYLENE; E - SILICONE; F - SILICONE; G - COMBINATION; H - TEFLON/POLYPROPYLENE; X- PURGING OTHER (SPECIFY)

SAMPLING DEVICE E — A - TEFLON; B - TEFLON; C - POLYETHYLENE; D - POLYETHYLENE; E - SILICONE; F - SILICONE; G - COMBINATION; H - TEFLON/POLYPROPYLENE; X- SAMPLING OTHER (SPECIFY)

FILTERING DEVICES 0.15 — A - IN-LINE DISPOSABLE; B - PRESSURE; C - VACUUM

FIELD MEASUREMENTS

WELL ELEVATION 592.77 (m/ft) GROUNDWATER ELEVATION 587.56 (m/ft)

DEPTH TO WATER 5.21 (m/ft) WELL DEPTH 21.34 (m/ft)

pH	TURBIDITY	CONDUCTIVITY	ORP	DO	SAMPLE TEMPERATURE
(std)	(ntu)	(µmhos/cm) AT 25 C	(mV)	(mg/L)	(°C)
(std)	(ntu)	(µmhos/cm) AT 25 C	(mV)	(mg/L)	(°C)
(std)	(ntu)	(µmhos/cm) AT 25 C	(mV)	(mg/L)	(°C)
(std)	(ntu)	(µmhos/cm) AT 25 C	(mV)	(mg/L)	(°C)
(std)	(ntu)	(µmhos/cm) AT 25 C	(mV)	(mg/L)	(°C)

FIELD COMMENTS

SAMPLE APPEARANCE Good ODOR none COLOR Clear TURBIDITY Clear

WEATHER CONDITIONS WIND SPEED 5-10 DIRECTION SW PRECIPITATION Y N (CIRCLE ONE) showers forecasted

SPECIFIC COMMENTS

PROPERLY THE SAMPLING DEVICE WAS OPERATED IN ACCORDANCE WITH APPLICABLE SAMPLING PROCEDURES

5/23/14 Thomas Bohlen Thomas Bohlen

DATE PRINT SIGNATURE

FAILURE TO DOCUMENT MODIFICATIONS MUST BE ACCOMPANIED BY A REVISION REQUEST FORM AT PROVED BY THE PROJECT MANAGER

microseeps ran from 1023-1053

MONITORING WELL RECORD FOR LOW-FLOW PURGING

Project Data:

Project Name: GMCH Delphi Harrison
Ref. No.: 56346
Date: 5/19/14
Personnel: T. Bohlen

Monitoring Well Data:

Well No.: MW-15
Measurement Point: TOR
Constructed Well Depth (ft): 17.90
Measured Well Depth (ft): 16.88
Depth of Sediment (ft):
Screen Length (ft): 7'
Depth to Pump Intake (ft)[1]: 13'
Well Diameter, D (in): 2"
Well ~~Screen~~ Volume, V_s (~~mL~~)[2]: 1 well vol. = 1.5 gal
Initial Depth to Water (ft): 7.56

Time	Pumping Rate (mL/min)	Depth to Water (ft)	Drawdown from Initial Water Level[3] (ft)	pH	Temperature °C	Conductivity (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Volume Purged, Vp (mL)	No. of Well Screen Volumes Purged[4]
847	*66	7.69		6.92	10.6	2.40	157.7	1.31	1.71	0	0
907		7.69		6.87	10.0	2.42	143.8	0.27	1.65	0.2	0
927		7.69		6.87	10.1	2.45	134.2	0.16	1.52	0.4	0
945		7.69		6.87	10.0	2.47	129.2	0.14	1.58	0.8	0
955		7.69		6.87	9.8	2.50	127.1	0.13	1.60	1.1	0
1005		7.69		6.87	10.0	2.48	125.3	0.11	1.62	1.2	0
1015		7.69		6.88	10.0	2.50	120.4	0.10	1.64	1.5	0

Notes:

(1) The pump intake will be placed at the well screen mid-point or at a minimum of 2 ft above any sediment accumulated at the well bottom.

(2) The well screen volume will be based on a 5-foot screen length. $V_s = p*(D/2)^2*(5*12)*(2.54)^3$

(3) The drawdown from the initial water level should not exceed 0.3 ft.

(4) Purging will continue until stabilization is achieved or until 20 well screen volumes have been purged (unless purge water remains visually turbid and appears to be clearing, or unless stabilization parameters are varying slightly outside of the stablization criteria and appear to be stablizing). No. of Well Screen Volumes Purged= V_p/V_s.

*- calculated using 1 L bottle & stopwatch

OVM @ TOR = 0.0ppm

FMG MODIFICATIONS MUST BE ACCOMPANIED BY A REVISION REQUEST FORM APPROVED BY THE PROJECT MANAGER

WELL PURGING FIELD INFORMATION FORM

JOB# 56546

SITE/PROJECT NAME: Delphi Harrison

WELL# MW-15

WELL PURGING INFORMATION

PURGE DATE (MM/DD/YY)	SAMPLE DATE (MM/DD/YY)	WATER VOL. IN CASING (LITRES/GALLONS)	WATER VOL. PURGED (LITRES/GALLONS)
051914	051914	1.5	1.5

PURGING AND SAMPLING EQUIPMENT

PURGING EQUIPMENT DEDICATED (Y) N (CIRCLE ONE)

SAMPLING EQUIPMENT DEDICATED (Y) N (CIRCLE ONE)

PURGING DEVICE: B — A-SUBMERSIBLE PUMP; B-PERISTALTIC PUMP; C-TUBE PUMP; D-BAILER; E-FLUID PUMP; F-WATERRAP; X- (PURGING OTHER SPECIFY)

SAMPLING DEVICE: B — A-BLADDER PUMP; B-DRIVER SUPPLE; X- (SAMPLING OTHER SPECIFY)

PURGING DEVICE: E — A-TEFLON; B-STAINLESS STEEL; C-POLYETHYLENE; D-PVC; X- (PURGING OTHER SPECIFY)

SAMPLING DEVICE: E — A-POLYPROPYLENE; X- (SAMPLING OTHER SPECIFY)

PURGING DEVICE: E — A-TEFLON; B-TYGON; C-POLYETHYLENE; D-POLYPROPYLENE; E-SILICONE; F-COMBINATION TEFLON/POLYPROPYLENE; X- (PURGING OTHER SPECIFY)

SAMPLING DEVICE: E — A-TEFLON; B-TYGON; C-POLYETHYLENE; D-POLYPROPYLENE; X- (SAMPLING OTHER SPECIFY)

FILTERING DEVICES 0.15 — A-INLINE DISPOSABLE; B-PRESSURE; C-VACUUM

FIELD MEASUREMENTS

WELL ELEVATION	594.04 (m/ft)	GROUNDWATER ELEVATION	586.48 (m/ft)
DEPTH TO WATER	7.56 (m/ft)	WELL DEPTH	16.88 (m/ft)

pH	TURBIDITY	CONDUCTIVITY	ORP	DO	SAMPLE TEMPERATURE
(std)	(ntu)	(µmhos/cm) AT 25°C	(mV)	(mg/L)	(°C)
(std)	(ntu)	(µmhos/cm) AT 25°C	(mV)	(mg/L)	(°C)
(std)	(ntu)	(µmhos/cm) AT 25°C	(mV)	(mg/L)	(°C)
(std)	(ntu)	(µmhos/cm) AT 25°C	(mV)	(mg/L)	(°C)
(std)	(ntu)	(µmhos/cm) AT 25°C	(mV)	(mg/L)	(°C)

FIELD COMMENTS

SAMPLE APPEARANCE: Good — ODOR: none — COLOR: Clear — FLOW: Clear

WEATHER CONDITIONS: WIND SPEED: 0-5 — DIRECTION: SW — PRECIPITATION: 0 — LIGHT: light rain

SPECIFIC COMMENTS:

I CERTIFY THAT SAMPLING WAS DONE IN ACCORDANCE WITH APPLICABLE SITE PROTOCOL

5/19/14 — Thomas Bohlen — Thomas Bohlen

DATE — PRINT — SIGNATURE

FIELD MODIFICATIONS MUST BE ACCOMPANIED BY A REVISION REQUEST FORM AFTER WHICH PROVIDED BY THE PROJECT MANAGER

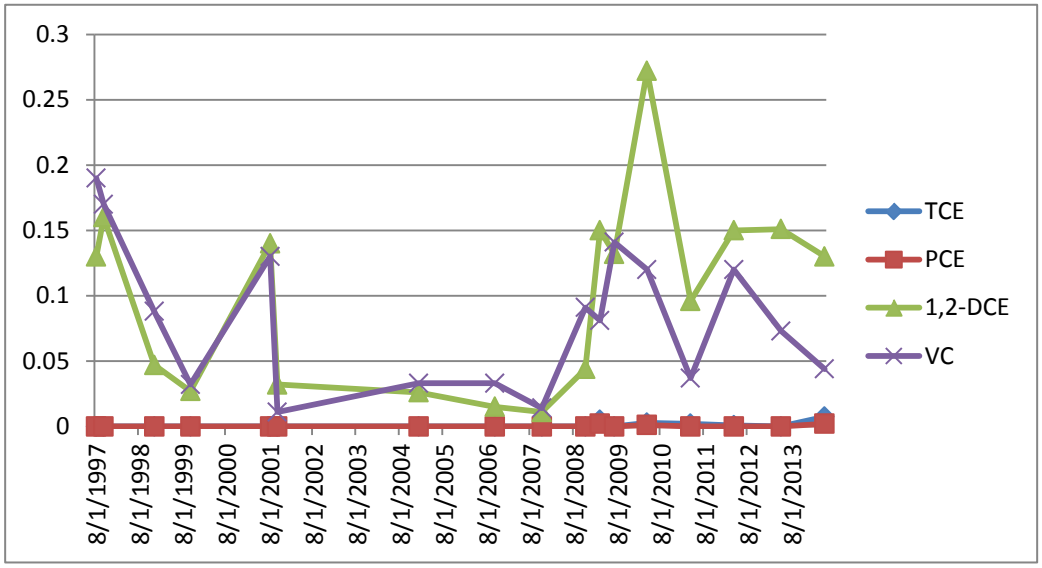
APPENDIX B

GRAPHS OF MONITORING WELL ANALYTICAL DATA FOR THE COCs

MW-12 Groundwater Data
Delphi Harrison Thermal Systems Site
GM Components Holdings, LLC
Lockport, New York

Date	TCE	PCE	1,2-DCE	VC
8/28/1997	<0.0005	<0.0005	0.13	0.19
10/10/1997	<0.0005	<0.0005	0.16	0.17
12/1/1998	<0.0005	<0.0005	0.047	0.088
10/6/1999	<0.0005	<0.0005	0.027	0.032
8/8/2001	<0.002	<0.002	0.14	0.13
10/30/2001	<0.002	<0.002	0.032	0.011
1/12/2005	<0.002	<0.002	0.026	0.033
10/25/2006	<0.002	<0.002	0.015	0.033
11/28/2007	<0.002	<0.002	0.011	0.014
11/14/2008	<0.002	<0.002	0.044	0.091
3/16/2009	0.005	0.002	0.15	0.081
7/16/2009	<0.005	<0.005	0.132	0.141
4/28/2010	0.0028	0.0011	0.272	0.12
4/20/2011	0.0021	<0.0004	0.096	0.037
4/18/2012	0.00083	<0.0004	0.15	0.12
5/3/2013	<0.002	<0.00036	0.151	0.073
5/19/2014	0.0074	0.002	0.13	0.044

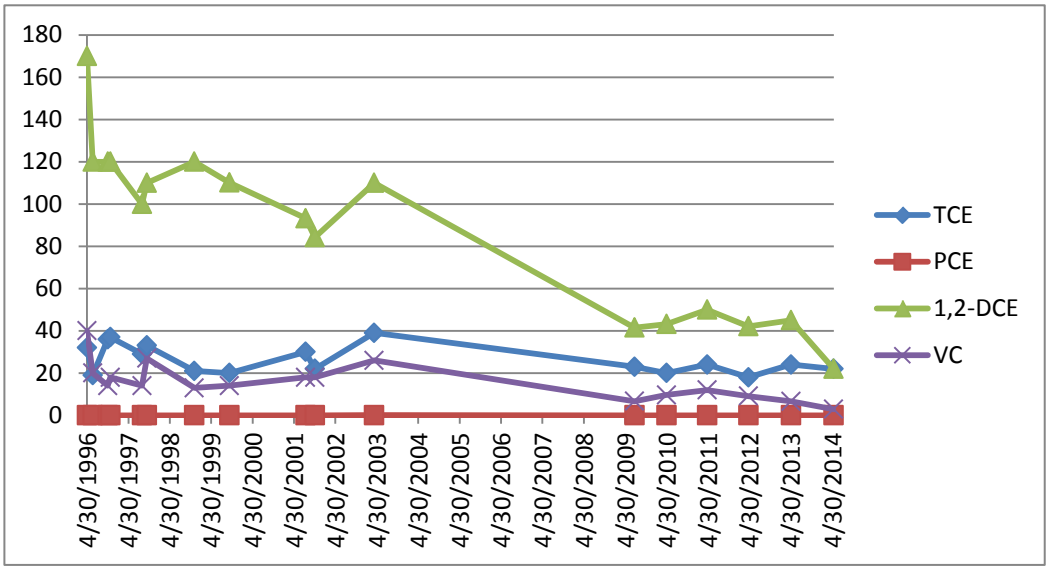
Notes:
Results are provided in parts per million (ppm)
Duplicate samples were collected from this location on 8/28/97 and 8/8/01. The higher of the two concentrations were recorded in this graph.



MW-4 Groundwater Data
Delphi Harrison Thermal Systems Site
GM Components Holdings, LLC
Lockport, New York

Date	TCE	PCE	1,2-DCE	VC
4/30/1996	32	<0.5	170	40
6/20/1996	19	<0.5	120	20
10/30/1996	36	<0.5	120	14
11/21/1996	37	<0.5	120	18
8/28/1997	29	<0.5	100	14
10/10/1997	33	<0.2	110	27
12/2/1998	21	<0.2	120	13
10/7/1999	20	<0.05	110.14	14
8/9/2001	30	0.003	93.28	18
10/31/2001	22	<0.002	84.25	18
4/7/2003	39	0.08	110	26
7/20/2009	23	<0.05	41.5	6.7
4/29/2010	20	0.0012	43.2	9.6
4/22/2011	24	0.0018	50	12
4/20/2012	18	0.0014	42.16	9.1
5/1/2013	24	<0.18	45	6.6
5/13/2014	22	<0.18	22	2.9

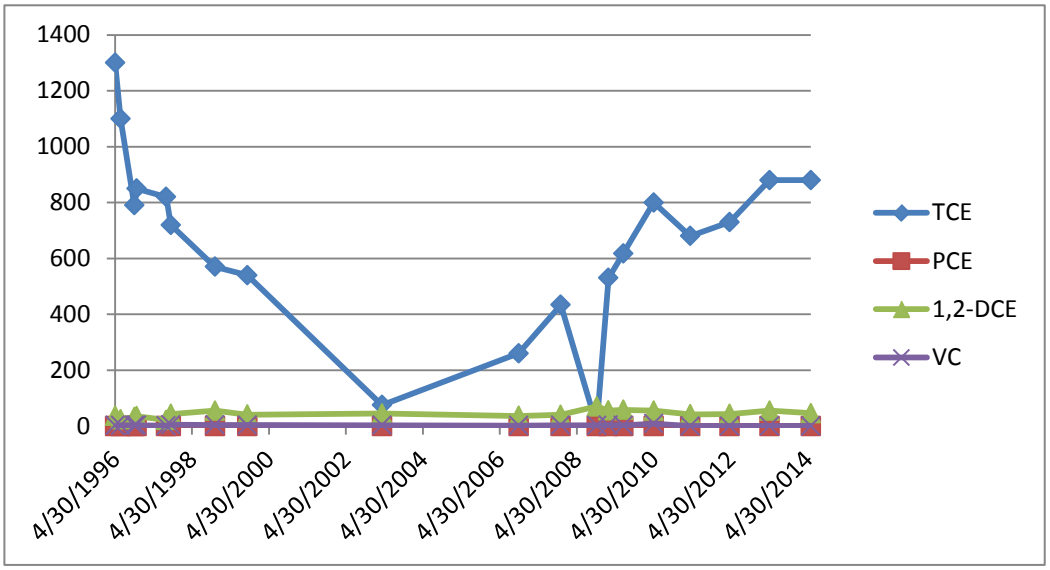
Notes:
Results are provided in parts per million (ppm)
Duplicate samples were collected from this location on 6/20/96, 10/30/96 and 12/2/98.
The higher of the two concentrations were recorded in this graph.



MW-7 Groundwater Data
Delphi Harrison Thermal Systems Site
GM Components Holdings, LLC
Lockport, New York

Date	TCE	PCE	1,2-DCE	VC
4/30/1996	1300	<0.5	37	1.8
6/20/1996	1100	<0.5	24	2.4
10/30/1996	790	<0.5	32	2.3
11/21/1996	850	<0.5	35	3.1
8/28/1997	820	<0.2	22	1.1
10/10/1997	720	<0.2	43	4.8
12/3/1998	570	<0.2	55	4.2
10/7/1999	540	<0.5	41	3.5
4/7/2003	75	<0.2	45	3
10/25/2006	260	0.077	36	1.7
11/29/2007	434	0.049	40	3.2
11/5/2008	1.1	<0.2	70	2.6
2/24/2009	530	0.071	56	3.6
7/15/2009	618	0.112	58.3	2.5
4/29/2010	800	0.14	55.2	9
4/11/2011	680	<1.8	42	<4.5
4/20/2012	730	<1.8	43	<4.5
5/3/2013	880	<3.6	55	<9
5/30/2014	880	<7.2	46	<18

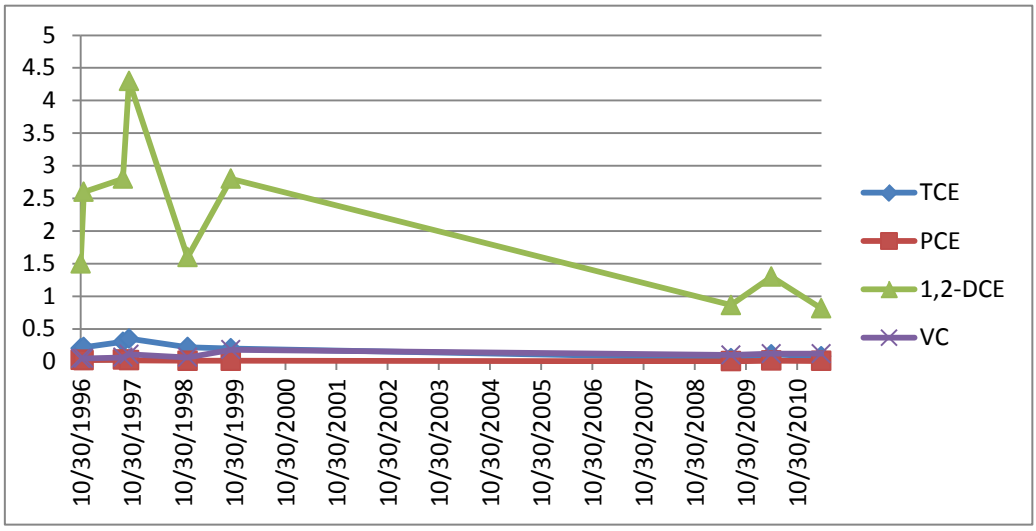
Notes:
Results are provided in parts per million (ppm)



MW-8 Groundwater Data
Delphi Harrison Thermal Systems Site
GM Components Holdings, LLC
Lockport, New York

Date	TCE	PCE	1,2-DCE	VC
10/30/1996	0.2	0.024	1.5	0.047
11/21/1996	0.22	0.022	2.6	0.049
8/28/1997	0.3	0.028	2.8	0.062
10/10/1997	0.35	0.018	4.3	0.11
12/2/1998	0.22	0.012	1.6	0.062
10/7/1999	0.2	0.011	2.802	0.18
7/15/2009	0.05	0.005	0.865	0.1
4/30/2010	0.11	0.013	1.3	0.12
4/22/2011	0.078	0.008	0.813	0.12

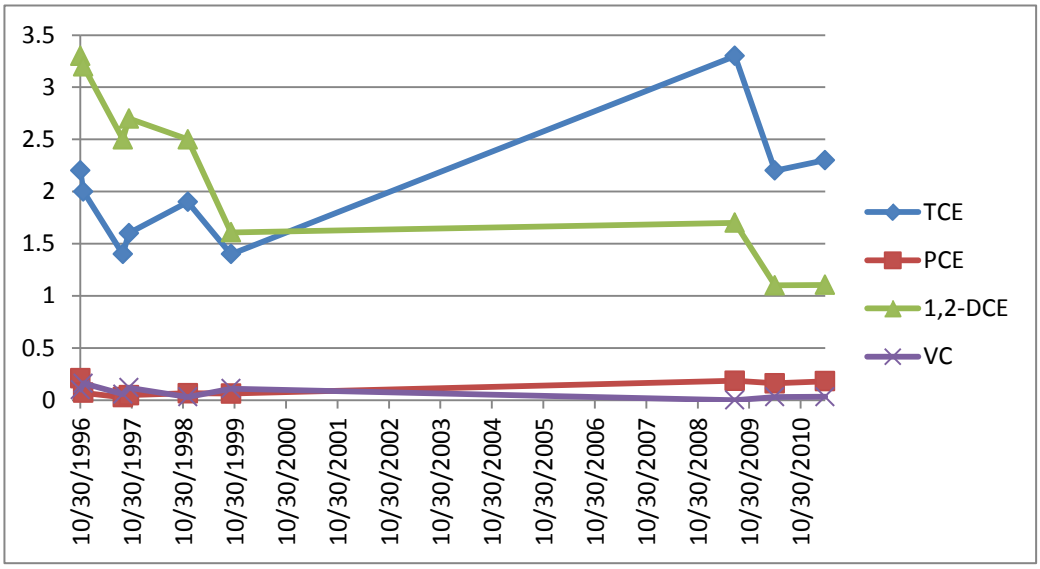
Notes:
Results are provided in parts per million (ppm)



MW-9 Groundwater Data
Delphi Harrison Thermal Systems Site
GM Components Holdings, LLC
Lockport, New York

Date	TCE	PCE	1,2-DCE	VC
10/30/1996	2.2	0.21	3.3	0.1
11/21/1996	2	0.07	3.2	0.16
8/28/1997	1.4	0.027	2.5	0.056
10/10/1997	1.6	0.047	2.7	0.12
12/2/1998	1.9	0.066	2.5	0.03
10/5/1999	1.4	0.062	1.608	0.11
7/20/2009	3.3	0.186	1.7	<0.05
4/30/2010	2.2	0.16	1.1	0.031
4/22/2011	2.3	0.18	1.105	0.032

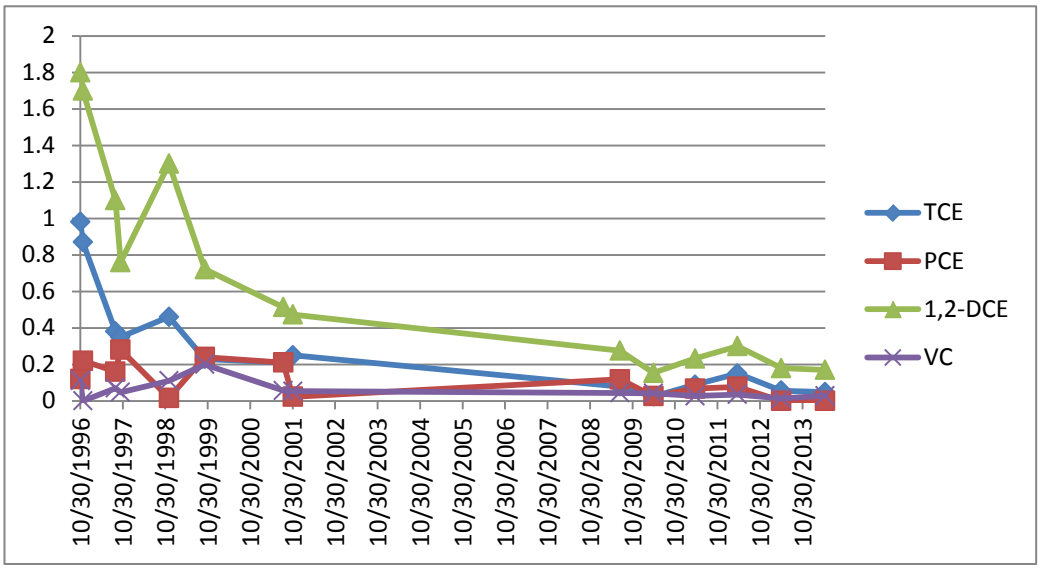
Notes:
Results are provided in parts per million (ppm)
Duplicate samples were collected from this location on 11/21/96 and 10/5/99. The higher of the two concentrations were recorded in this graph.



MW-10 Groundwater Data
Delphi Harrison Thermal Systems Site
GM Components Holdings, LLC
Lockport, New York

Date	TCE	PCE	1,2-DCE	VC
10/30/1996	0.98	0.12	1.8	0.11
11/21/1996	0.87	0.22	1.7	<0.1
8/28/1997	0.38	0.16	1.1	0.07
10/10/1997	0.35	0.28	0.76	0.047
12/1/1998	0.46	0.016	1.3	0.11
10/6/1999	0.23	0.24	0.722	0.2
8/9/2001	0.21	0.21	0.514	0.057
10/31/2001	0.25	0.023	0.473	0.053
7/15/2009	0.079	0.118	0.275	0.044
4/28/2010	0.024	0.026	0.153	0.042
4/21/2011	0.088	0.067	0.232	0.027
4/19/2012	0.15	0.077	0.3	0.035
5/1/2013	0.056	<0.0014	0.18	0.014
5/14/2014	0.048	<0.0014	0.17	0.029

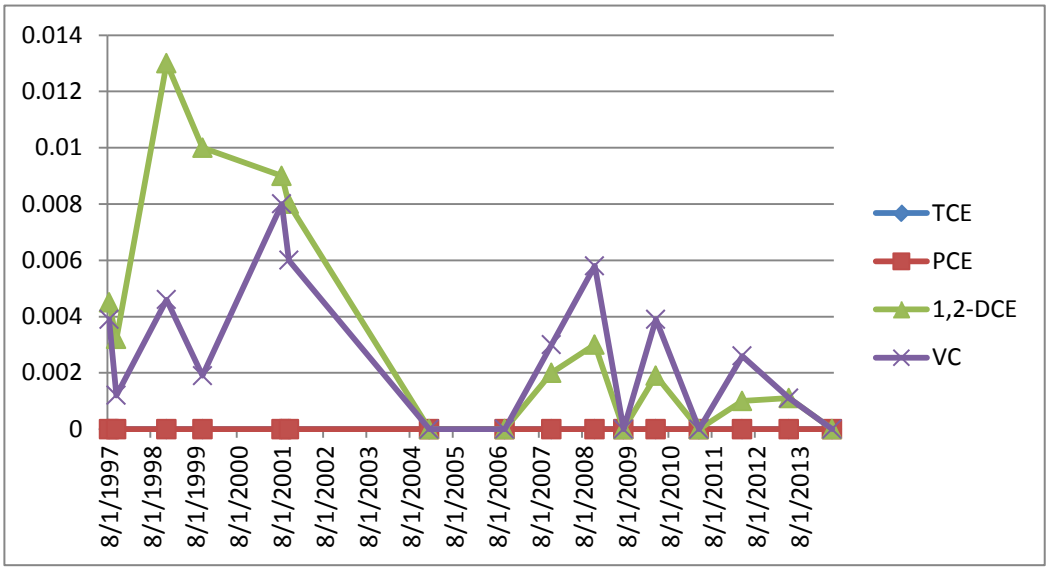
Notes:
Results are provided in parts per million (ppm)



MW-11 Groundwater Data
Delphi Harrison Thermal Systems Site
GM Components Holdings, LLC
Lockport, New York

Date	TCE	PCE	1,2-DCE	VC
8/28/1997	<0.0005	<0.0005	0.0045	0.0039
10/10/1997	<0.0005	<0.0005	0.0032	0.0012
12/1/1998	<0.0005	<0.0005	0.013	0.0046
10/5/1999	<0.0005	<0.0005	0.01	0.0019
8/8/2001	<0.002	<0.002	0.009	0.008
10/30/2001	<0.002	<0.002	0.008	0.006
1/12/2005	<0.002	<0.002	<0.002	<0.002
10/24/2006	<0.002	<0.002	<0.002	<0.002
11/28/2007	<0.002	<0.002	0.002	0.003
11/4/2008	<0.002	<0.002	0.003	0.0058
7/16/2009	<0.005	<0.005	<0.005	<0.005
4/28/2010	<0.0005	<0.0004	0.0019	0.0039
4/21/2011	<0.0005	<0.0004	<0.0008	<0.0009
4/19/2012	<0.0005	<0.0004	0.001	0.0026
5/2/2013	<0.00046	<0.00036	0.0011	0.0011
5/20/2014	<0.00046	<0.00036	<0.00081	<0.0009

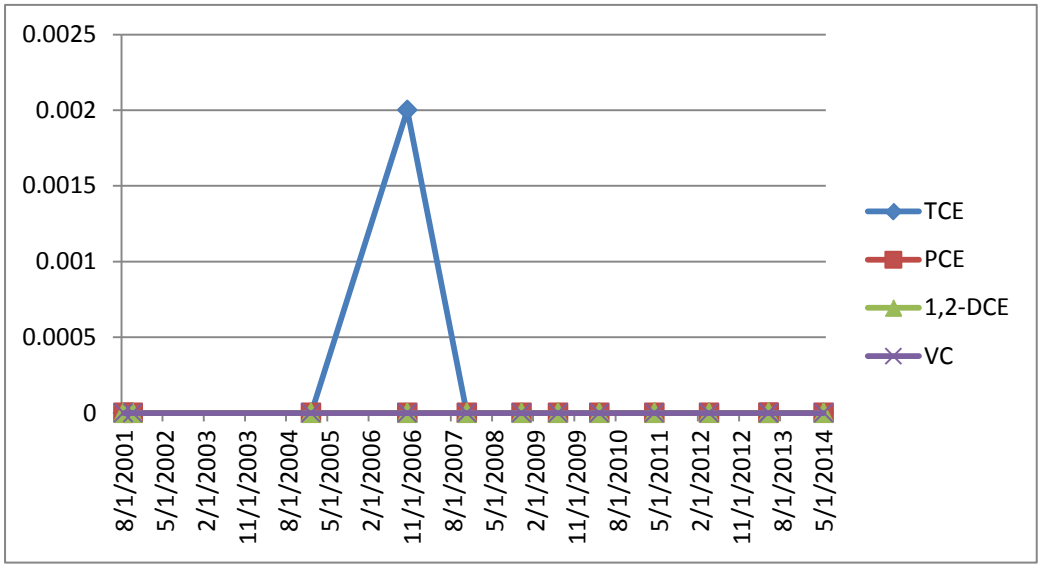
Notes:
Results are provided in parts per million (ppm)
Duplicate samples were collected from this location on 10/10/97. The higher of the two concentrations were recorded in this graph.



MW-13 Groundwater Data
Delphi Harrison Thermal Systems Site
GM Components Holdings, LLC
Lockport, New York

Date	TCE	PCE	1,2-DCE	VC
8/8/2001	<0.002	<0.002	<0.002	<0.002
10/29/2001	<0.002	<0.002	<0.002	<0.002
1/12/2005	<0.002	<0.002	<0.002	<0.002
10/24/2006	0.002	<0.002	<0.002	<0.002
11/28/2007	<0.002	<0.002	<0.002	<0.002
11/5/2008	<0.002	<0.002	<0.002	<0.002
7/16/2009	<0.005	<0.005	<0.005	<0.005
4/28/2010	<0.0005	<0.0004	<0.0008	<0.0009
4/21/2011	<0.0005	<0.0004	<0.0008	<0.0009
4/19/2012	<0.0005	<0.0004	<0.0008	<0.0009
5/2/2013	<0.00046	<0.00036	<0.00081	<0.0009
5/2/2013	<0.00046	<0.00036	<0.00081	<0.0009
5/20/2014	<0.00046	<0.00036	<0.00081	<0.0009

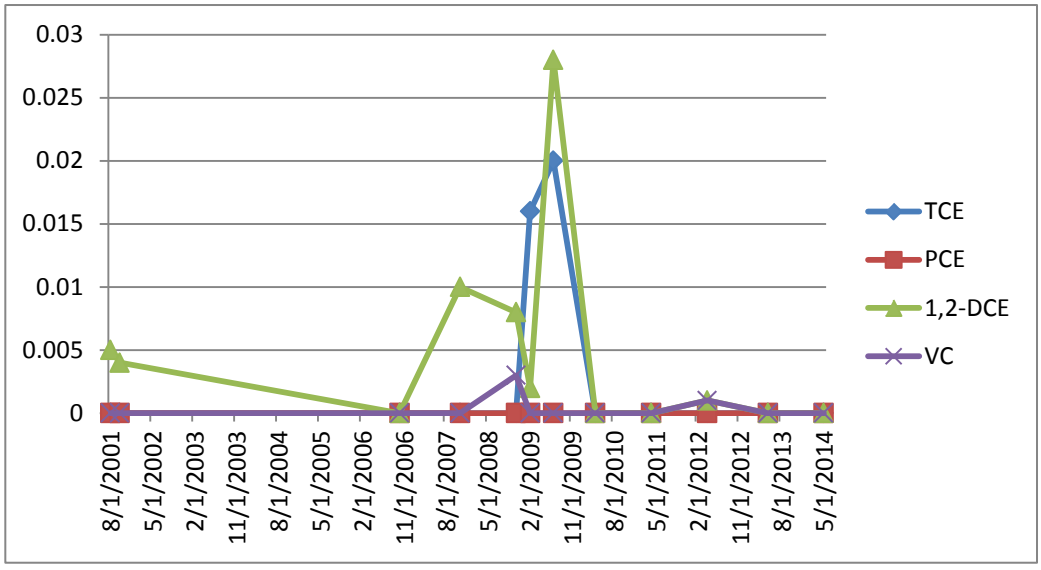
Notes:
Results are provided in parts per million (ppm)
A duplicate sample was collected from this location on 4/19/2012.
The higher of the two concentrations were recorded in this graph.



MW-14 Groundwater Data
Delphi Harrison Thermal Systems Site
GM Components Holdings, LLC
Lockport, New York

Date	TCE	PCE	1,2-DCE	VC
8/10/2001	<0.002	<0.002	0.005	<0.002
10/30/2001	<0.002	<0.002	0.004	<0.002
10/24/2006	<0.002	<0.002	<0.002	<0.002
11/29/2007	<0.002	<0.002	0.01	<0.002
11/4/2008	<0.002	<0.002	0.008	0.003
2/24/2009	0.016	<0.002	0.002	<0.002
7/19/2009	0.02	<0.005	0.028	<0.005
4/27/2010	<0.005	<0.0004	<0.0008	<0.0009
4/21/2011	<0.005	<0.0004	<0.0008	<0.0009
4/19/2012	<0.005	<0.0004	0.001	0.001
5/3/2013	<0.00046	<0.00036	<0.00081	<0.0009
5/23/2014	<0.00046	<0.00036	<0.00081	<0.0009

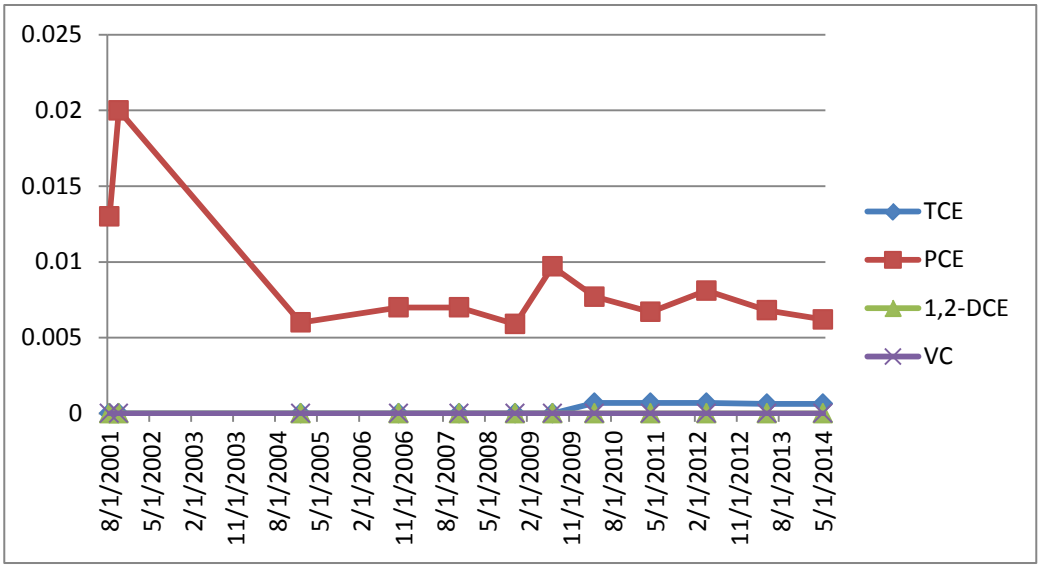
Notes:
Results are provided in parts per million (ppm)



MW-15 Groundwater Data
Delphi Harrison Thermal Systems Site
GM Components Holdings, LLC
Lockport, New York

Date	TCE	PCE	1,2-DCE	VC
8/8/2001	<0.002	0.013	<0.002	<0.002
10/30/2001	<0.002	0.02	<0.002	<0.002
1/12/2005	<0.002	0.006	<0.002	<0.002
10/24/2006	<0.002	0.007	<0.002	<0.002
11/28/2007	<0.002	0.007	<0.002	<0.002
11/4/2008	<0.002	0.0059	<0.002	<0.002
7/16/2009	<0.005	0.0097	<0.005	<0.005
4/28/2010	0.0007	0.0077	<0.0008	<0.0009
4/21/2011	0.0007	0.0067	<0.0008	<0.0009
4/18/2012	0.0007	0.0081	<0.0008	<0.0009
5/1/2013	0.00064	0.0068	<0.00081	<0.0009
5/19/2014	0.00064	0.0062	<0.00081	<0.0009

Notes:
Results are provided in parts per million (ppm)
Duplicate samples were collected from this location on 10/30/01. The higher of the two concentrations were recorded in this graph.



APPENDIX C

ANAEROBIC BIODEGRADATION SCREENING TABLES

EPA cVOC MONITORED NATURAL ATTENUATION RANKING SYSTEM

Strength of Evidence Scorecard
Delphi Harrison Thermal Systems Site
GM Component Holdings, LLC
Lockport, New York

Analysis	Concentration in Most Contaminated Zone	Value	EXAMPLE Lab or Field Analysis Value (mg/L)	EXAMPLE Score	MW-4	MW-7	MW-10	MW-11	MW-12	MW-13	MW-14	MW-15
DO	<0.5 mg/L	3	3.5		3		3		3	3	3	3
DO	>5 mg/l	-3										
Nitrate	<1 mg/L	2	ND	2	2	2	2	2	2	2	2	2
Iron II	>1 mg/l	2	0.2						2	2		
Sulfate	<20 mg/L	2	243									
Sulfide	>1 mg/L	3	0.6									
Methane	<0.5 mg/L	0	0.26	0	3	0	0	0	0	0	0	0
Methane	>0.5 mg/L	3										
ORP	<50 mV	1	-98.5	1	1	1		1	1	1	1	
ORP	<-100 mV	2										
pH	5< pH <9	0	6.8	0	0	0	0	0	0	0	0	
pH	5> pH >10	-2										
TOC	>20 mg/L	2	1.5									
Temp	> 20°C	1	20.4	1								
Carbon Dioxide	>2 times background (4.2)	1	6.8		1		1		1	1		
Alkalinity	>2 times background (200)	1	372							1		1
Chloride	>2 times background (1440)	2	338									
Hydrogen	>1 nM	3	NT		0	NT	0	3	3	3	3	0
Hydrogen	<1nM	0	NT									
Volatile Fatty Acids	>0.1 mg/L	2	ND		NT	NT	NT	NT	NT	NT	NT	NT
BTEX	>0.1 mg/L	2	ND		NT	NT	NT	NT	NT	NT	NT	NT
PCE		0	ND									
TCE	If Daughter Product	2	190									
DCE	If Daughter Product	2	10,034	2	2	2	2					
VC	If Daughter Product	2	380.00	2	2	2	2		2			
1,1,1-TCA		0	ND									
DCA	If Daughter Product	2	ND									
Carbon Tetrachloride		0	ND									
Chloroethane	If Daughter Product	2	ND									
Ethene/Ethane	>0.01 mg/L or	2	0.0097		2	2						
	>0.1 mg/L	3										
Chloroform	If Daughter Product	2	ND									
Dichloromethane	If Daughter Product	2	ND									
				8	**16**	**9**	**10**	**6**	**14**	**13**	**9**	**6**

Scoring Interpretation	
0 to 5	Inadequate evidence for anaerobic biodegradation* of chlorinated organics
6 to 14	Limited evidence for anaerobic biodegradation* of chlorinated organics
15 to 20	Adequate evidence for anaerobic biodegradation* of chlorinated organics
>20	Strong evidence for anaerobic biodegradation* of chlorinated organics
*reductive dechlorination	
Values Taken from EPA Document **EPA/600/R-98/128,** *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water* , 1998, Table 2.3 and Table 2.4	

Notes:
1. ND=not detected
2. NT=not tested

ATTACHMENT A

TEST AMERICA ANALYTICAL LABORATORY REPORT

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

TestAmerica Job ID: 480-60213-1
Client Project/Site: 058507, GM-Lockport Groundwater Sampling
Revision: 1

For:
Conestoga-Rovers & Associates, Inc.
2055 Niagara Falls Blvd., Suite 3
Niagara Falls, New York 14304

Attn: Kathleen Willy

Melissa Deyo

Authorized for release by:
7/1/2014 2:15:36 PM

Melissa Deyo, Project Manager I
(716)504-9874
melissa.deyo@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Cover Page 1
Table of Contents 2
Definitions/Glossary 3
Case Narrative 4
Detection Summary 5
Client Sample Results 6
Surrogate Summary 8
QC Sample Results 9
QC Association Summary 15
Lab Chronicle 18
Certification Summary 19
Method Summary 21
Sample Summary 22
Subcontract Data 23
Chain of Custody 32
Receipt Checklists 33

Qualifiers

Metals

Qualifier	Qualifier Description
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC exceeds the control limits.

General Chemistry

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60213-1

Job ID: 480-60213-1

Laboratory: TestAmerica Buffalo

Narrative

Job Narrative
480-60213-1

Revision I
This report was revised to correct the units the following sample was reported if for method AM20GAX, Hydrogen: MW-11-052014 (480-60213-2).

Receipt
The samples were received on 5/20/2014 3:10 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.1° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

IC
Method(s) 300.0: The following sample(s) was diluted to bring the concentration of target analytes within the calibration range: MW-13-052014 (480-60213-1). Elevated reporting limits (RLs) are provided.

Method(s) 300.0: The following sample(s) was diluted to bring the concentration of target analytes within the calibration range: MW-11-052014 (480-60213-2), MW-13-052014 (480-60213-1). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
Method(s) 6010C: The low level continuing calibration verification (CCVL) recovered above the upper control limit for total magnesium and manganese. The sample(s) MW-11-052014 (480-60213-2), MW-13-052014 (480-60213-1) associated with this CCVL contained this analyte at a concentration greater than 10X the value found in the CCVL; therefore, re-analysis of samples was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
Method(s) SM 2320B: The method blank for batch 183737 contained alkalinity above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.MW-11-052014 (480-60213-2), MW-13-052014 (480-60213-1)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60213-1

Client Sample ID: MW-13-052014 — Lab Sample ID: 480-60213-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Hydrogen	1.8		0.60		nm	1		AM20GAX	Total/NA
Methane	73		4.0	1.0	ug/L	1		RSK-175	Total/NA
Iron	6.4		0.050	0.019	mg/L	1		6010C	Total/NA
Magnesium	42.3	^	0.20	0.043	mg/L	1		6010C	Total/NA
Manganese	4.4	^	0.0030	0.00040	mg/L	1		6010C	Total/NA
Chloride	1740		25.0	14.1	mg/L	50		300.0	Total/NA
Sulfate	82.5		20.0	3.5	mg/L	10		300.0	Total/NA
Ammonia	0.88		0.020	0.0090	mg/L	1		350.1	Total/NA
Nitrate	0.089		0.050	0.020	mg/L	1		353.2	Total/NA
Total Organic Carbon	4.5		1.0	0.43	mg/L	1		9060A	Total/NA
Total Alkalinity	419	B	5.0	0.79	mg/L	1		SM 2320B	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Carbon dioxide	16000		1000	1000	ug/L	1		RSK-175	Total/NA

Client Sample ID: MW-11-052014 — Lab Sample ID: 480-60213-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Hydrogen	60		2.4		nm	4		AM20GAX	Total/NA
Methane	6.7		4.0	1.0	ug/L	1		RSK-175	Total/NA
Iron	0.18		0.050	0.019	mg/L	1		6010C	Total/NA
Magnesium	34.4	^	0.20	0.043	mg/L	1		6010C	Total/NA
Manganese	0.13	^	0.0030	0.00040	mg/L	1		6010C	Total/NA
Chloride	200		2.5	1.4	mg/L	5		300.0	Total/NA
Sulfate	61.5		2.0	0.35	mg/L	1		300.0	Total/NA
Ammonia	0.12		0.020	0.0090	mg/L	1		350.1	Total/NA
Nitrate	0.29		0.050	0.020	mg/L	1		353.2	Total/NA
Total Organic Carbon	1.2		1.0	0.43	mg/L	1		9060A	Total/NA
Total Alkalinity	274	B	5.0	0.79	mg/L	1		SM 2320B	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Carbon dioxide	5000		1000	1000	ug/L	1		RSK-175	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-13-052014

Lab Sample ID: 480-60213-1

Date Collected: 05/20/14 10:15

Matrix: Water

Date Received: 05/20/14 15:10

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			05/23/14 07:44	1
Tetrachloroethene	ND		1.0	0.36	ug/L			05/23/14 07:44	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			05/23/14 07:44	1
Trichloroethene	ND		1.0	0.46	ug/L			05/23/14 07:44	1
Vinyl chloride	ND		1.0	0.90	ug/L			05/23/14 07:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*66 - 137*		*05/23/14 07:44*	*1*
4-Bromofluorobenzene (Surr)	*99*		*73 - 120*		*05/23/14 07:44*	*1*
Toluene-d8 (Surr)	*105*		*71 - 126*		*05/23/14 07:44*	*1*
Dibromofluoromethane (Surr)	*112*		*60 - 140*		*05/23/14 07:44*	*1*

Method: AM20GAX - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hydrogen	**1.8**		0.60		nm			05/28/14 10:13	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	ND		7.5	1.5	ug/L			05/21/14 16:15	1
Ethene	ND		7.0	1.5	ug/L			05/21/14 16:15	1
Methane	**73**		4.0	1.0	ug/L			05/21/14 16:15	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon dioxide	**16000**		1000	1000	ug/L			05/27/14 16:07	1

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	**6.4**		0.050	0.019	mg/L		05/21/14 09:15	05/21/14 22:56	1
Magnesium	**42.3**	**^**	0.20	0.043	mg/L		05/21/14 09:15	05/21/14 22:56	1
Manganese	**4.4**	**^**	0.0030	0.00040	mg/L		05/21/14 09:15	05/21/14 22:56	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1740**		25.0	14.1	mg/L			05/23/14 15:43	50
Sulfate	**82.5**		20.0	3.5	mg/L			05/22/14 19:28	10
Ammonia	**0.88**		0.020	0.0090	mg/L			06/03/14 18:57	1
Nitrate	**0.089**		0.050	0.020	mg/L			05/21/14 23:04	1
Nitrite	ND		0.050	0.020	mg/L			05/21/14 23:04	1
Total Organic Carbon	**4.5**		1.0	0.43	mg/L			05/27/14 15:55	1
Total Alkalinity	**419**	**B**	5.0	0.79	mg/L			05/22/14 13:58	1
Sulfide	ND		0.10	0.052	mg/L			05/24/14 10:20	1

Client Sample ID: MW-11-052014

Lab Sample ID: 480-60213-2

Date Collected: 05/20/14 14:15

Matrix: Water

Date Received: 05/20/14 15:10

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			05/23/14 08:05	1
Tetrachloroethene	ND		1.0	0.36	ug/L			05/23/14 08:05	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			05/23/14 08:05	1

Client Sample ID: MW-11-052014
Date Collected: 05/20/14 14:15
Date Received: 05/20/14 15:10

Lab Sample ID: 480-60213-2
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Trichloroethene	ND		1.0	0.46	ug/L			05/23/14 08:05	1
Vinyl chloride	ND		1.0	0.90	ug/L			05/23/14 08:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*66 - 137*		*05/23/14 08:05*	*1*
4-Bromofluorobenzene (Surr)	*97*		*73 - 120*		*05/23/14 08:05*	*1*
Toluene-d8 (Surr)	*104*		*71 - 126*		*05/23/14 08:05*	*1*
Dibromofluoromethane (Surr)	*106*		*60 - 140*		*05/23/14 08:05*	*1*

Method: AM20GAX - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hydrogen	**60**		2.4		nm			05/28/14 14:38	4

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	ND		7.5	1.5	ug/L			05/21/14 16:32	1
Ethene	ND		7.0	1.5	ug/L			05/21/14 16:32	1
Methane	**6.7**		4.0	1.0	ug/L			05/21/14 16:32	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon dioxide	**5000**		1000	1000	ug/L			05/27/14 16:15	1

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	**0.18**		0.050	0.019	mg/L		05/21/14 09:15	05/21/14 22:59	1
Magnesium	**34.4**	^	0.20	0.043	mg/L		05/21/14 09:15	05/21/14 22:59	1
Manganese	**0.13**	^	0.0030	0.00040	mg/L		05/21/14 09:15	05/21/14 22:59	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**200**		2.5	1.4	mg/L			05/23/14 15:53	5
Sulfate	**61.5**		2.0	0.35	mg/L			05/22/14 19:38	1
Ammonia	**0.12**		0.020	0.0090	mg/L			06/03/14 18:59	1
Nitrate	**0.29**		0.050	0.020	mg/L			05/21/14 23:05	1
Nitrite	ND		0.050	0.020	mg/L			05/21/14 23:05	1
Total Organic Carbon	**1.2**		1.0	0.43	mg/L			05/27/14 16:26	1
Total Alkalinity	**274**	B	5.0	0.79	mg/L			05/22/14 13:44	1
Sulfide	ND		0.10	0.052	mg/L			05/24/14 10:20	1

Surrogate Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60213-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		12DCE	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(66-137)	(73-120)	(71-126)	(60-140)
480-60213-1	MW-13-052014	110	99	105	112
480-60213-2	MW-11-052014	108	97	104	106
LCS 480-183684/5	Lab Control Sample	103	105	103	109
MB 480-183684/7	Method Blank	111	100	107	110

Surrogate Legend

12DCE = 1,2-Dichloroethane-d4 (Surr)

BFB = 4-Bromofluorobenzene (Surr)

TOL = Toluene-d8 (Surr)

DBFM = Dibromofluoromethane (Surr)

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 480-183684/7
Matrix: Water
Analysis Batch: 183684

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			05/23/14 01:20	1
Tetrachloroethene	ND		1.0	0.36	ug/L			05/23/14 01:20	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			05/23/14 01:20	1
Trichloroethene	ND		1.0	0.46	ug/L			05/23/14 01:20	1
Vinyl chloride	ND		1.0	0.90	ug/L			05/23/14 01:20	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*66 - 137*		*05/23/14 01:20*	*1*
4-Bromofluorobenzene (Surr)	*100*		*73 - 120*		*05/23/14 01:20*	*1*
Toluene-d8 (Surr)	*107*		*71 - 126*		*05/23/14 01:20*	*1*
Dibromofluoromethane (Surr)	*110*		*60 - 140*		*05/23/14 01:20*	*1*

Lab Sample ID: LCS 480-183684/5
Matrix: Water
Analysis Batch: 183684

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,2-Dichloroethene	25.0	26.7		ug/L		107	74 - 124
Tetrachloroethene	25.0	23.8		ug/L		95	74 - 122
trans-1,2-Dichloroethene	25.0	26.9		ug/L		107	73 - 127
Trichloroethene	25.0	25.8		ug/L		103	74 - 123

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*103*		*66 - 137*
4-Bromofluorobenzene (Surr)	*105*		*73 - 120*
Toluene-d8 (Surr)	*103*		*71 - 126*
Dibromofluoromethane (Surr)	*109*		*60 - 140*

Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 480-183269/3
Matrix: Water
Analysis Batch: 183269

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	ND		7.5	1.5	ug/L			05/21/14 09:39	1
Ethene	ND		7.0	1.5	ug/L			05/21/14 09:39	1
Methane	ND		4.0	1.0	ug/L			05/21/14 09:39	1

Lab Sample ID: LCS 480-183269/4
Matrix: Water
Analysis Batch: 183269

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ethane	14.6	15.6		ug/L		107	52 - 138
Ethene	13.5	14.4		ug/L		107	50 - 137
Methane	7.69	8.44		ug/L		110	48 - 174

Method: RSK-175 - Dissolved Gases (GC) (Continued)

Lab Sample ID: LCSD 480-183269/5
Matrix: Water
Analysis Batch: 183269

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ethane	14.6	15.8		ug/L		109	52 - 138	2	50
Ethene	13.5	14.7		ug/L		109	50 - 137	2	50
Methane	7.69	8.49		ug/L		110	48 - 174	1	50

Lab Sample ID: MB 200-72640/13
Matrix: Water
Analysis Batch: 72640

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon dioxide	ND		1000	1000	ug/L			05/27/14 13:42	1

Lab Sample ID: LCS 200-72640/12
Matrix: Water
Analysis Batch: 72640

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Carbon dioxide	5010	5400		ug/L		108	70 - 130

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 480-183225/1-A
Matrix: Water
Analysis Batch: 183499

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 183225

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.050	0.019	mg/L		05/21/14 09:15	05/21/14 21:27	1
Magnesium	ND		0.20	0.043	mg/L		05/21/14 09:15	05/21/14 21:27	1
Manganese	ND		0.0030	0.00040	mg/L		05/21/14 09:15	05/21/14 21:27	1

Lab Sample ID: LCS 480-183225/2-A
Matrix: Water
Analysis Batch: 183499

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 183225

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	10.0	9.89		mg/L		99	80 - 120
Magnesium	10.0	10.40		mg/L		104	80 - 120
Manganese	0.200	0.205		mg/L		102	80 - 120

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 480-183568/28
Matrix: Water
Analysis Batch: 183568

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			05/22/14 18:27	1
Sulfate	ND		2.0	0.35	mg/L			05/22/14 18:27	1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 480-183568/27
Matrix: Water
Analysis Batch: 183568

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	20.11		mg/L		101	90 - 110
Sulfate	20.0	19.72		mg/L		99	90 - 110

Lab Sample ID: 480-60213-2 MS
Matrix: Water
Analysis Batch: 183568

Client Sample ID: MW-11-052014
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	61.5		25.0	85.91		mg/L		97	90 - 110

Lab Sample ID: MB 480-183850/4
Matrix: Water
Analysis Batch: 183850

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			05/23/14 15:33	1
Sulfate	ND		2.0	0.35	mg/L			05/23/14 15:33	1

Lab Sample ID: LCS 480-183850/3
Matrix: Water
Analysis Batch: 183850

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	20.25		mg/L		101	90 - 110
Sulfate	20.0	19.95		mg/L		100	90 - 110

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 480-185494/27
Matrix: Water
Analysis Batch: 185494

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.020	0.0090	mg/L			06/03/14 18:02	1

Lab Sample ID: MB 480-185494/51
Matrix: Water
Analysis Batch: 185494

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.020	0.0090	mg/L			06/03/14 18:23	1

Lab Sample ID: MB 480-185494/75
Matrix: Water
Analysis Batch: 185494

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.020	0.0090	mg/L			06/03/14 18:44	1

Method: 350.1 - Nitrogen, Ammonia (Continued)

Lab Sample ID: LCS 480-185494/28
Matrix: Water
Analysis Batch: 185494

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	1.03		mg/L		103	90 - 110

Lab Sample ID: LCS 480-185494/52
Matrix: Water
Analysis Batch: 185494

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	1.03		mg/L		103	90 - 110

Lab Sample ID: LCS 480-185494/76
Matrix: Water
Analysis Batch: 185494

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	1.03		mg/L		103	90 - 110

Method: 353.2 - Nitrogen, Nitrite

Lab Sample ID: MB 480-183454/3
Matrix: Water
Analysis Batch: 183454

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrite	ND		0.050	0.020	mg/L			05/21/14 23:02	1

Lab Sample ID: LCS 480-183454/4
Matrix: Water
Analysis Batch: 183454

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrite	1.50	1.55		mg/L		103	90 - 110

Method: 9060A - Organic Carbon, Total (TOC)

Lab Sample ID: MB 480-184514/18
Matrix: Water
Analysis Batch: 184514

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		1.0	0.43	mg/L			05/26/14 23:50	1

Lab Sample ID: MB 480-184514/37
Matrix: Water
Analysis Batch: 184514

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		1.0	0.43	mg/L			05/27/14 10:42	1

Method: 9060A - Organic Carbon, Total (TOC) (Continued)

Lab Sample ID: LCS 480-184514/19
Matrix: Water
Analysis Batch: 184514

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	60.0	58.82		mg/L		98	90 - 110

Lab Sample ID: LCS 480-184514/38
Matrix: Water
Analysis Batch: 184514

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	60.0	57.68		mg/L		96	90 - 110

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 480-183737/6
Matrix: Water
Analysis Batch: 183737

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity	1.27	J	5.0	0.79	mg/L			05/22/14 13:25	1

Lab Sample ID: LCS 480-183737/7
Matrix: Water
Analysis Batch: 183737

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Alkalinity	100	91.52		mg/L		92	90 - 110

Lab Sample ID: 480-60213-1 MS
Matrix: Water
Analysis Batch: 183737

Client Sample ID: MW-13-052014
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Alkalinity	419	B	100	470.3	4	mg/L		51	42 - 116

Lab Sample ID: 480-60213-2 DU
Matrix: Water
Analysis Batch: 183737

Client Sample ID: MW-11-052014
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Alkalinity	274	B	275.6		mg/L		0.7	20

Method: SM 4500 S2 D - Sulfide, Total

Lab Sample ID: MB 480-183997/3
Matrix: Water
Analysis Batch: 183997

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		0.10	0.052	mg/L			05/24/14 10:20	1

Method: SM 4500 S2 D - Sulfide, Total (Continued)

Lab Sample ID: LCS 480-183997/4
Matrix: Water
Analysis Batch: 183997

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfide	0.750	0.805		mg/L		107	90 - 110

GC/MS VOA

Analysis Batch: 183684

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60213-1	MW-13-052014	Total/NA	Water	8260C	
480-60213-2	MW-11-052014	Total/NA	Water	8260C	
LCS 480-183684/5	Lab Control Sample	Total/NA	Water	8260C	
MB 480-183684/7	Method Blank	Total/NA	Water	8260C	

GC VOA

Analysis Batch: 72640

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60213-1	MW-13-052014	Total/NA	Water	RSK-175	
480-60213-2	MW-11-052014	Total/NA	Water	RSK-175	
LCS 200-72640/12	Lab Control Sample	Total/NA	Water	RSK-175	
MB 200-72640/13	Method Blank	Total/NA	Water	RSK-175	

Analysis Batch: 183269

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60213-1	MW-13-052014	Total/NA	Water	RSK-175	
480-60213-2	MW-11-052014	Total/NA	Water	RSK-175	
LCS 480-183269/4	Lab Control Sample	Total/NA	Water	RSK-175	
LCSD 480-183269/5	Lab Control Sample Dup	Total/NA	Water	RSK-175	
MB 480-183269/3	Method Blank	Total/NA	Water	RSK-175	

Analysis Batch: 185472

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60213-1	MW-13-052014	Total/NA	Water	AM20GAX	
480-60213-2	MW-11-052014	Total/NA	Water	AM20GAX	

Metals

Prep Batch: 183225

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60213-1	MW-13-052014	Total/NA	Water	3005A	
480-60213-2	MW-11-052014	Total/NA	Water	3005A	
LCS 480-183225/2-A	Lab Control Sample	Total/NA	Water	3005A	
MB 480-183225/1-A	Method Blank	Total/NA	Water	3005A	

Analysis Batch: 183499

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60213-1	MW-13-052014	Total/NA	Water	6010C	183225
480-60213-2	MW-11-052014	Total/NA	Water	6010C	183225
LCS 480-183225/2-A	Lab Control Sample	Total/NA	Water	6010C	183225
MB 480-183225/1-A	Method Blank	Total/NA	Water	6010C	183225

General Chemistry

Analysis Batch: 183454

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60213-1	MW-13-052014	Total/NA	Water	353.2	
480-60213-2	MW-11-052014	Total/NA	Water	353.2	
LCS 480-183454/4	Lab Control Sample	Total/NA	Water	353.2	

General Chemistry (Continued)

Analysis Batch: 183454 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 480-183454/3	Method Blank	Total/NA	Water	353.2	

Analysis Batch: 183456

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60213-1	MW-13-052014	Total/NA	Water	353.2	
480-60213-2	MW-11-052014	Total/NA	Water	353.2	

Analysis Batch: 183568

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60213-1	MW-13-052014	Total/NA	Water	300.0	
480-60213-2	MW-11-052014	Total/NA	Water	300.0	
480-60213-2 MS	MW-11-052014	Total/NA	Water	300.0	
LCS 480-183568/27	Lab Control Sample	Total/NA	Water	300.0	
MB 480-183568/28	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 183737

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60213-1	MW-13-052014	Total/NA	Water	SM 2320B	
480-60213-1 MS	MW-13-052014	Total/NA	Water	SM 2320B	
480-60213-2	MW-11-052014	Total/NA	Water	SM 2320B	
480-60213-2 DU	MW-11-052014	Total/NA	Water	SM 2320B	
LCS 480-183737/7	Lab Control Sample	Total/NA	Water	SM 2320B	
MB 480-183737/6	Method Blank	Total/NA	Water	SM 2320B	

Analysis Batch: 183850

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60213-1	MW-13-052014	Total/NA	Water	300.0	
480-60213-2	MW-11-052014	Total/NA	Water	300.0	
LCS 480-183850/3	Lab Control Sample	Total/NA	Water	300.0	
MB 480-183850/4	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 183997

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60213-1	MW-13-052014	Total/NA	Water	SM 4500 S2 D	
480-60213-2	MW-11-052014	Total/NA	Water	SM 4500 S2 D	
LCS 480-183997/4	Lab Control Sample	Total/NA	Water	SM 4500 S2 D	
MB 480-183997/3	Method Blank	Total/NA	Water	SM 4500 S2 D	

Analysis Batch: 184514

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60213-1	MW-13-052014	Total/NA	Water	9060A	
480-60213-2	MW-11-052014	Total/NA	Water	9060A	
LCS 480-184514/19	Lab Control Sample	Total/NA	Water	9060A	
LCS 480-184514/38	Lab Control Sample	Total/NA	Water	9060A	
MB 480-184514/18	Method Blank	Total/NA	Water	9060A	
MB 480-184514/37	Method Blank	Total/NA	Water	9060A	

Analysis Batch: 185494

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60213-1	MW-13-052014	Total/NA	Water	350.1	
480-60213-2	MW-11-052014	Total/NA	Water	350.1	

General Chemistry (Continued)

Analysis Batch: 185494 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 480-185494/28	Lab Control Sample	Total/NA	Water	350.1	
LCS 480-185494/52	Lab Control Sample	Total/NA	Water	350.1	
LCS 480-185494/76	Lab Control Sample	Total/NA	Water	350.1	
MB 480-185494/27	Method Blank	Total/NA	Water	350.1	
MB 480-185494/51	Method Blank	Total/NA	Water	350.1	
MB 480-185494/75	Method Blank	Total/NA	Water	350.1	

Lab Chronicle

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60213-1

Client Sample ID: MW-13-052014

Lab Sample ID: 480-60213-1

Date Collected: 05/20/14 10:15

Matrix: Water

Date Received: 05/20/14 15:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	183684	05/23/14 07:44	GTG	TAL BUF
Total/NA	Analysis	AM20GAX		1	185472	05/28/14 10:13	CTB	SC0015
Total/NA	Analysis	RSK-175		1	72640	05/27/14 16:07	NEA	TAL BUR
Total/NA	Analysis	RSK-175		1	183269	05/21/14 16:15	JRL	TAL BUF
Total/NA	Prep	3005A			183225	05/21/14 09:15	EHD	TAL BUF
Total/NA	Analysis	6010C		1	183499	05/21/14 22:56	MTM2	TAL BUF
Total/NA	Analysis	300.0		10	183568	05/22/14 19:28	KRC	TAL BUF
Total/NA	Analysis	300.0		50	183850	05/23/14 15:43	KRC	TAL BUF
Total/NA	Analysis	350.1		1	185494	06/03/14 18:57	RS	TAL BUF
Total/NA	Analysis	353.2		1	183456	05/21/14 23:04	RS	TAL BUF
Total/NA	Analysis	353.2		1	183454	05/21/14 23:04	RS	TAL BUF
Total/NA	Analysis	9060A		1	184514	05/27/14 15:55	KRC	TAL BUF
Total/NA	Analysis	SM 2320B		1	183737	05/22/14 13:58	VAJ	TAL BUF
Total/NA	Analysis	SM 4500 S2 D		1	183997	05/24/14 10:20	EGS	TAL BUF

Client Sample ID: MW-11-052014

Lab Sample ID: 480-60213-2

Date Collected: 05/20/14 14:15

Matrix: Water

Date Received: 05/20/14 15:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	183684	05/23/14 08:05	GTG	TAL BUF
Total/NA	Analysis	AM20GAX		4	185472	05/28/14 14:38	CTB	SC0015
Total/NA	Analysis	RSK-175		1	72640	05/27/14 16:15	NEA	TAL BUR
Total/NA	Analysis	RSK-175		1	183269	05/21/14 16:32	JRL	TAL BUF
Total/NA	Prep	3005A			183225	05/21/14 09:15	EHD	TAL BUF
Total/NA	Analysis	6010C		1	183499	05/21/14 22:59	MTM2	TAL BUF
Total/NA	Analysis	300.0		1	183568	05/22/14 19:38	KRC	TAL BUF
Total/NA	Analysis	300.0		5	183850	05/23/14 15:53	KRC	TAL BUF
Total/NA	Analysis	350.1		1	185494	06/03/14 18:59	RS	TAL BUF
Total/NA	Analysis	353.2		1	183456	05/21/14 23:05	RS	TAL BUF
Total/NA	Analysis	353.2		1	183454	05/21/14 23:05	RS	TAL BUF
Total/NA	Analysis	9060A		1	184514	05/27/14 16:26	KRC	TAL BUF
Total/NA	Analysis	SM 2320B		1	183737	05/22/14 13:44	VAJ	TAL BUF
Total/NA	Analysis	SM 4500 S2 D		1	183997	05/24/14 10:20	EGS	TAL BUF

Laboratory References:

SC0015 = Pittsburgh, PA (formerly Microseeps), 220 William Pitt Way, Pittsburgh, PA 15238, TEL (412)826-5245

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL BUR = TestAmerica Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Certification Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60213-1

Laboratory: TestAmerica Buffalo

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0686	07-06-14 *
California	State Program	9	1169CA	09-30-14
Connecticut	State Program	1	PH-0568	09-30-14
Florida	NELAP	4	E87672	06-30-15
Georgia	State Program	4	N/A	03-31-15
Illinois	NELAP	5	200003	09-30-14
Iowa	State Program	7	374	03-01-15
Kansas	NELAP	7	E-10187	01-31-15
Kentucky (DW)	State Program	4	90029	12-31-14
Kentucky (UST)	State Program	4	30	03-31-15
Louisiana	NELAP	6	02031	06-30-14 *
Maine	State Program	1	NY00044	12-04-14
Maryland	State Program	3	294	03-31-15
Massachusetts	State Program	1	M-NY044	06-30-15
Michigan	State Program	5	9937	03-31-15
Minnesota	NELAP	5	036-999-337	12-31-14
New Hampshire	NELAP	1	2337	11-17-14
New Jersey	NELAP	2	NY455	06-30-15
New York	NELAP	2	10026	03-31-15
North Dakota	State Program	8	R-176	03-31-14 *
Oklahoma	State Program	6	9421	08-31-14
Oregon	NELAP	10	NY200003	06-09-15
Pennsylvania	NELAP	3	68-00281	07-31-14
Rhode Island	State Program	1	LAO00328	12-30-14
Tennessee	State Program	4	TN02970	03-31-15
Texas	NELAP	6	T104704412-11-2	07-31-14
USDA	Federal		P330-11-00386	11-22-14
Virginia	NELAP	3	460185	09-14-14
Washington	State Program	10	C784	02-10-15
Wisconsin	State Program	5	998310390	08-31-14

Laboratory: TestAmerica Burlington

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Connecticut	State Program	1	PH-0751	09-30-15
DE Haz. Subst. Cleanup Act (HSCA)	State Program	3	NA	02-13-15
Florida	NELAP	4	E87467	06-30-15
L-A-B	DoD ELAP		L2336	02-26-17
Louisiana	NELAP	6	176292	06-30-14
Maine	State Program	1	VT00008	04-17-15
Minnesota	NELAP	5	050-999-436	12-31-14
New Hampshire	NELAP	1	2006	12-18-14
New Jersey	NELAP	2	VT972	06-30-15
New York	NELAP	2	10391	03-31-15
Pennsylvania	NELAP	3	68-00489	04-30-15
Rhode Island	State Program	1	LAO00298	12-30-14
US Fish & Wildlife	Federal		LE-058448-0	02-28-15
USDA	Federal		P330-11-00093	10-28-16
Vermont	State Program	1	VT-4000	12-31-14

* Certification renewal pending - certification considered valid.

Certification Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60213-1

Laboratory: TestAmerica Burlington (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Virginia	NELAP	3	460209	12-14-14

Method Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60213-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	TAL BUF
AM20GAX	Dissolved Gases (GC)	NONE	SC0015
RSK-175	Dissolved Gases (GC)	RSK	TAL BUR
RSK-175	Dissolved Gases (GC)	RSK	TAL BUF
6010C	Metals (ICP)	SW846	TAL BUF
300.0	Anions, Ion Chromatography	MCAWW	TAL BUF
350.1	Nitrogen, Ammonia	MCAWW	TAL BUF
353.2	Nitrogen, Nitrite	MCAWW	TAL BUF
353.2	Nitrate	EPA	TAL BUF
9060A	Organic Carbon, Total (TOC)	SW846	TAL BUF
SM 2320B	Alkalinity	SM	TAL BUF
SM 4500 S2 D	Sulfide, Total	SM	TAL BUF

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

NONE = NONE

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

SC0015 = Pittsburgh, PA (formerly Microseeps), 220 William Pitt Way, Pittsburgh, PA 15238, TEL (412)826-5245

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL BUR = TestAmerica Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Sample Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60213-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-60213-1	MW-13-052014	Water	05/20/14 10:15	05/20/14 15:10
480-60213-2	MW-11-052014	Water	05/20/14 14:15	05/20/14 15:10

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

June 2, 2014

Melissa Deyo
Test America
10 Hazelwood Drive
Buffalo, NY 14228

RE: **480-60213-1**

Microseeps Workorder: 12227

Dear Melissa Deyo:

Enclosed are the analytical results for sample(s) received by the laboratory on Wednesday, May 21, 2014. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Robbin Robl 06/02/2014
rrobl@microseeps.com

Customer Service Representative

Enclosures

As a valued client we would appreciate your comments on our service.
Please email info@microseeps.com.

Total Number of Pages 9

CERTIFICATE OF ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

LABORATORY ACCREDITATIONS & CERTIFICATIONS

Accreditor:	Pennsylvania Department of Environmental Protection, Bureau of Laboratories
Accreditation ID:	02-00538
Scope:	NELAP Non-Potable Water and Solid & Hazardous Waste
Accreditor:	NELAP: State of Florida, Department of Health, Bureau of Laboratories
Accreditation ID:	E87832
Scope:	Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)
Accreditor:	South Carolina Department of Health and Environmental Control, Office of Environmental Laboratory Certification
Accreditation ID:	89009003
Scope:	Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA)
Accreditor:	NELAP: State of Louisiana, Department of Environmental Quality
Accreditation ID:	04104
Scope:	Solid and Chemical Materials; Non-Potable Water
Accreditor:	NELAP: New Jersey, Department of Environmental Protection
Accreditation ID:	PA026
Scope:	Non-Potable Water; Solid and Chemical Materials
Accreditor:	NELAP: New York, Department of Health Wadsworth Center
Accreditation ID:	11815
Scope:	Non-Potable Water; Solid and Hazardous Waste
Accreditor:	State of Connecticut, Department of Public Health, Division of Environmental Health
Accreditation ID:	PH-0263
Scope:	Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)
Accreditor:	NELAP: Texas, Commission on Environmental Quality
Accreditation ID:	T104704453-09-TX
Scope:	Non-Potable Water
Accreditor:	State of New Hampshire
Accreditation ID:	299409
Scope:	Non-potable water
Accreditor:	State of Georgia
Accreditation ID:	Chapter 391-3-26
Scope:	As per the Georgia EPD Rules and Regulations for Commercial Laboratories, Microseeps is accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

CERTIFICATE OF ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

SAMPLE SUMMARY

Workorder: 12227 480-60213-1

Lab ID	Sample ID	Matrix	Date Collected	Date Received
122270001	MW-13-052014(480-60213-1)	Bubble Strip	5/20/2014 10:15	5/21/2014 11:00
122270002	MW-11-052014(480-60213-2)	Bubble Strip	5/20/2014 14:15	5/21/2014 11:00

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 12227 480-60213-1

Lab ID: **122270001** Date Received: 5/21/2014 11:00 Matrix: Bubble Strip

Sample ID: **MW-13-052014(480-60213-1)** Date Collected: 5/20/2014 10:15

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
RISK - MICR										
Analysis Desc: AM20GAX			Analytical Method: AM20GAX							
Hydrogen	**1.8**	nM	0.60	0.13	1			5/28/2014 10:13	GT	

CERTIFICATE OF ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 12227 480-60213-1

Lab ID: **122270002** Date Received: 5/21/2014 11:00 Matrix: Bubble Strip

Sample ID: **MW-11-052014(480-60213-2)** Date Collected: 5/20/2014 14:15

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
RISK - MICR										
Analysis Desc: AM20GAX			Analytical Method: AM20GAX							
Hydrogen	**60**	nM	2.4	0.52	4			5/28/2014 14:38	GT	

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS QUALIFIERS

Workorder: 12227 480-60213-1

DEFINITIONS/QUALIFIERS

Disclaimer : The Pennsylvania Department of Environmental Protection (PADEP) has decided to no longer recognize analyses that do not produce data for primary compliance, for NELAP accreditation. The methods affected by this decision are AM20GAx, AM21G, SW846 7199 and AM4.02. The laboratory shall continue to administer the NELAP/TNI standard requirements in the performance of these methods.

MDL	Method Detection Limit. Can be used synonymously with LOD; Limit Of Detection.
PQL	Practical Quanitation Limit. Can be used synonymously with LOQ; Limit Of Quantitation.
ND	Not detected at or above reporting limit.
DF	Dilution Factor.
S	Surrogate.
RPD	Relative Percent Difference.
% Rec	Percent Recovery.
U	Indicates the compound was analyzed for, but not detected at or above the noted concentration.
J	Estimated concentration greater than the set method detection limit (MDL) and less than the set reporting limit (PQL).

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

QUALITY CONTROL DATA

Workorder: 12227 480-60213-1

QC Batch: DISG/3800 Analysis Method: AM20GAX

QC Batch Method: AM20GAX

Associated Lab Samples: 122270001, 122270002

METHOD BLANK: 27980

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Hydrogen	nM	0.60 U	0.60	

LABORATORY CONTROL SAMPLE & LCSD: 27981 27982

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
RISK										
Hydrogen	nM	24	22	22	92	92	80-120	0	20	

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 12227 480-60213-1

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
122270001	MW-13-052014(480-60213-1)			AM20GAX	DISG/3800
122270002	MW-11-052014(480-60213-2)			AM20GAX	DISG/3800

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

12227

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Deyo, Melissa L	Carrier Tracking No(s):	COC No: 480-16496.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: melissa.deyo@testamericainc.com		Page: Page 1 of 1
Company: Pace Analytical Services, Inc.				Job #: 480-60213-1
Address: 220 William Pitt Way,	Due Date Requested: 6/2/2014			
City: Pittsburgh	TAT Requested (days):			
State, Zip: PA, 15238				
Phone: 412-826-5245(Tel)	PO #:			
Email:	WO #:			
Project Name: 058507, GM-Lockport Groundwater Sampling	Project #: 48004014			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	AM20GAX/ Hydrogen	Total Number of containers	Special Instructions/Note:
			Preservation Code:-						
MW-13-052014 (480-60213-1)	5/20/14	10:15 Eastern		Water			X	1	
MW-11-052014 (480-60213-2)	5/20/14	14:15 Eastern		Water			X	1	

Possible Hazard Identification
Unconfirmed

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For _____ Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	Cameron Wallace	5-20-14 1700	TABUT		5.21.14 1100	PAES
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custoc

480-60213 Chain of Custody

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: T. Bohlen	Lab PM: Deyo, Melissa L	COC No: 480-49375-13138.4
Client Contact: Mr. Tom Bohlen	Phone: 716 685-2300	E-Mail: melissa.deyo@testa	Page: Page 4 of 4
Company: GZA GeoEnvironmental, Inc.			Job #:
Address: 535 Washington Street 11th Floor	Due Date Requested:		
City: Buffalo	TAT Requested (days):		
State, Zip: NY, 14203			
Phone:	PO #: 4062165		
Email: thomas.bohlen@gza.com	WO #: 58507		
Project Name: 058507, GM-Lockport Groundwater Sampling	Project #: 48004014		
Site:	SSOW#:		

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	RSK_175_CO2 - Carbon dioxide	350.1 - Ammonia	6010B - Metals - Fe, Mn, Mg	8260B - PCE, TCE, DCE (trans and cis), Vinyl Chl	9060 - Total Organic Carbon	RSK_175 - Methane, Ethane, Ethene	SM4500_S2_D - Sulfide	353.2, 353.2_Nitrite, Nitrate_Calc	2320B - Total Alkalinity	300.0_28D - Anions (Chloride & Sulfate)		AM 20 GAX	Total Number of containers	Special Instructions/Note:
			Preservation Code:		N	N	N	S	D	A	A	A	CB	N	N	N				
MW-13-052014	5/20/14	1015	G	Water	N	N	X	X	X	X	X	X	X	X	X	X		X		Dissolved H2 for
MW-11-052014	↓	1415	G	Water	N	N	X	X	X	X	X	X	X	X	X	X		X		Microseeps
				Water																
				Water																
				Water																
				Water																

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☑ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by: Thomas Bohlen	Date/Time: 5/20/14 1510	Company	Received by:	Date/Time: 5/20/14 1510	Company FA Buff
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: #2 3.1

7/1/2014

Login Sample Receipt Checklist

Client: Conestoga-Rovers & Associates, Inc.

Job Number: 480-60213-1

Login Number: 60213

List Source: TestAmerica Buffalo

List Number: 1

Creator: Janish, Carl M

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	gza
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	N/A	
Chlorine Residual checked.	N/A	

Login Sample Receipt Checklist

Client: Conestoga-Rovers & Associates, Inc.

Job Number: 480-60213-1

Login Number: 60213
List Number: 2
Creator: Gagne, Eric M

List Source: TestAmerica Burlington
List Creation: 05/22/14 12:18 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	877415
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	2.6ºC. IR GUN ID 181. CF = 0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

TestAmerica Job ID: 480-60502-1

Client Project/Site: 058507, GM-Lockport Groundwater Sampling

For:

Conestoga-Rovers & Associates, Inc.
2055 Niagara Falls Blvd., Suite 3
Niagara Falls, New York 14304

Attn: Kathleen Willy

Authorized for release by:
6/13/2014 12:51:54 PM
Rebecca Jones, Project Management Assistant I
rebecca.jones@testamericainc.com

Designee for

Melissa Deyo, Project Manager I
(716)504-9874
melissa.deyo@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Cover Page 1
Table of Contents 2
Definitions/Glossary 3
Case Narrative 4
Detection Summary 5
Client Sample Results 6
Surrogate Summary 7
QC Sample Results 8
QC Association Summary 13
Lab Chronicle 15
Certification Summary 16
Method Summary 18
Sample Summary 19
Subcontract Data 20
Chain of Custody 30
Receipt Checklists 31

Qualifiers

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 480-60502-1

Laboratory: TestAmerica Buffalo

Narrative

Job Narrative
480-60502-1

Receipt
The sample was received on 5/23/2014 4:45 PM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.2º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

IC
Method(s) 300.0: The following sample(s) was diluted to bring the concentration of target analytes within the calibration range: MW-14-052314 (480-60502-1). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
Method(s) 6010C: The method blank for batch 480-184063 contained total iron above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples MW-14-052314 (480-60502-1) was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
Method(s) SM 2320B: The method blank for batch 184244 contained alkalinity above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.MW-14-052314 (480-60502-1)

Method(s) 353.2: The method blanks for batch 183945 contained nitrate-nitrite concentrations above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.MW-14-052314 (480-60502-1)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60502-1

Client Sample ID: MW-14-052314

Lab Sample ID: 480-60502-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Hydrogen	2.3		0.60		nm	1		AM20GAX	Total/NA
Methane	8.3		4.0	1.0	ug/L	1		RSK-175	Total/NA
Iron	0.036	J B	0.050	0.019	mg/L	1		6010C	Total/NA
Magnesium	40.1		0.20	0.043	mg/L	1		6010C	Total/NA
Manganese	0.30		0.0030	0.00040	mg/L	1		6010C	Total/NA
Chloride	790		5.0	2.8	mg/L	10		300.0	Total/NA
Sulfate	34.7		20.0	3.5	mg/L	10		300.0	Total/NA
Ammonia	0.055		0.020	0.0090	mg/L	1		350.1	Total/NA
Nitrite	0.036	J	0.050	0.020	mg/L	1		353.2	Total/NA
Total Organic Carbon	1.6		1.0	0.43	mg/L	1		9060A	Total/NA
Total Alkalinity	396	B	5.0	0.79	mg/L	1		SM 2320B	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Carbon dioxide	7100		1000	1000	ug/L	1		RSK-175	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60502-1

Client Sample ID: MW-14-052314
Date Collected: 05/23/14 11:45
Date Received: 05/23/14 16:45

Lab Sample ID: 480-60502-1
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			06/03/14 03:42	1
Tetrachloroethene	ND		1.0	0.36	ug/L			06/03/14 03:42	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			06/03/14 03:42	1
Trichloroethene	ND		1.0	0.46	ug/L			06/03/14 03:42	1
Vinyl chloride	ND		1.0	0.90	ug/L			06/03/14 03:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*114*		*66 - 137*		*06/03/14 03:42*	*1*
4-Bromofluorobenzene (Surr)	*99*		*73 - 120*		*06/03/14 03:42*	*1*
Toluene-d8 (Surr)	*107*		*71 - 126*		*06/03/14 03:42*	*1*
Dibromofluoromethane (Surr)	*105*		*60 - 140*		*06/03/14 03:42*	*1*

Method: AM20GAX - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hydrogen	**2.3**		0.60		nm			06/05/14 14:57	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	ND		7.5	1.5	ug/L			05/27/14 12:56	1
Ethene	ND		7.0	1.5	ug/L			05/27/14 12:56	1
Methane	**8.3**		4.0	1.0	ug/L			05/27/14 12:56	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon dioxide	**7100**		1000	1000	ug/L			06/02/14 15:11	1

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	**0.036**	**J B**	0.050	0.019	mg/L		05/27/14 09:25	05/27/14 18:45	1
Magnesium	**40.1**		0.20	0.043	mg/L		05/27/14 09:25	05/27/14 18:45	1
Manganese	**0.30**		0.0030	0.00040	mg/L		05/27/14 09:25	05/27/14 18:45	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**790**		5.0	2.8	mg/L			05/28/14 17:10	10
Sulfate	**34.7**		20.0	3.5	mg/L			05/28/14 17:10	10
Ammonia	**0.055**		0.020	0.0090	mg/L			05/30/14 14:22	1
Nitrate	ND		0.050	0.020	mg/L			05/24/14 00:01	1
Nitrite	**0.036**	**J**	0.050	0.020	mg/L			05/24/14 00:01	1
Total Organic Carbon	**1.6**		1.0	0.43	mg/L			05/29/14 07:10	1
Total Alkalinity	**396**	**B**	5.0	0.79	mg/L			05/27/14 16:48	1
Sulfide	ND		0.10	0.052	mg/L			05/27/14 12:00	1

Surrogate Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60502-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		12DCE	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(66-137)	(73-120)	(71-126)	(60-140)
480-60502-1	MW-14-052314	114	99	107	105
LCS 480-185288/5	Lab Control Sample	110	106	106	113
MB 480-185288/7	Method Blank	115	98	110	110

Surrogate Legend

12DCE = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 480-185288/7
Matrix: Water
Analysis Batch: 185288

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			06/02/14 23:30	1
Tetrachloroethene	ND		1.0	0.36	ug/L			06/02/14 23:30	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			06/02/14 23:30	1
Trichloroethene	ND		1.0	0.46	ug/L			06/02/14 23:30	1
Vinyl chloride	ND		1.0	0.90	ug/L			06/02/14 23:30	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*115*		*66 - 137*		*06/02/14 23:30*	*1*
4-Bromofluorobenzene (Surr)	*98*		*73 - 120*		*06/02/14 23:30*	*1*
Toluene-d8 (Surr)	*110*		*71 - 126*		*06/02/14 23:30*	*1*
Dibromofluoromethane (Surr)	*110*		*60 - 140*		*06/02/14 23:30*	*1*

Lab Sample ID: LCS 480-185288/5
Matrix: Water
Analysis Batch: 185288

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,2-Dichloroethene	25.0	27.2		ug/L		109	74 - 124
Tetrachloroethene	25.0	23.5		ug/L		94	74 - 122
trans-1,2-Dichloroethene	25.0	27.0		ug/L		108	73 - 127
Trichloroethene	25.0	26.6		ug/L		106	74 - 123

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*110*		*66 - 137*
4-Bromofluorobenzene (Surr)	*106*		*73 - 120*
Toluene-d8 (Surr)	*106*		*71 - 126*
Dibromofluoromethane (Surr)	*113*		*60 - 140*

Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 480-184085/3
Matrix: Water
Analysis Batch: 184085

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	ND		7.5	1.5	ug/L			05/27/14 08:25	1
Ethene	ND		7.0	1.5	ug/L			05/27/14 08:25	1
Methane	ND		4.0	1.0	ug/L			05/27/14 08:25	1

Lab Sample ID: LCS 480-184085/4
Matrix: Water
Analysis Batch: 184085

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ethane	14.6	16.0		ug/L		110	52 - 138
Ethene	13.5	14.5		ug/L		108	50 - 137
Methane	7.69	8.66		ug/L		113	48 - 174

Method: RSK-175 - Dissolved Gases (GC) (Continued)

Lab Sample ID: LCSD 480-184085/5
Matrix: Water
Analysis Batch: 184085

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ethane	14.6	16.0		ug/L		110	52 - 138	0	50
Ethene	13.5	14.5		ug/L		107	50 - 137	0	50
Methane	7.69	8.73		ug/L		113	48 - 174	1	50

Lab Sample ID: MB 200-72919/3
Matrix: Water
Analysis Batch: 72919

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon dioxide	ND		1000	1000	ug/L			06/02/14 11:14	1

Lab Sample ID: LCS 200-72919/2
Matrix: Water
Analysis Batch: 72919

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Carbon dioxide	5010	5340		ug/L		107	70 - 130

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 480-184063/1-A
Matrix: Water
Analysis Batch: 184294

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 184063

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	0.0291	J	0.050	0.019	mg/L		05/27/14 09:25	05/27/14 17:36	1
Magnesium	ND		0.20	0.043	mg/L		05/27/14 09:25	05/27/14 17:36	1
Manganese	ND		0.0030	0.00040	mg/L		05/27/14 09:25	05/27/14 17:36	1

Lab Sample ID: LCS 480-184063/2-A
Matrix: Water
Analysis Batch: 184294

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 184063

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	10.0	9.96		mg/L		100	80 - 120
Magnesium	10.0	10.78		mg/L		108	80 - 120
Manganese	0.200	0.211		mg/L		105	80 - 120

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 480-184371/4
Matrix: Water
Analysis Batch: 184371

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			05/28/14 14:28	1
Sulfate	ND		2.0	0.35	mg/L			05/28/14 14:28	1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 480-184371/3
Matrix: Water
Analysis Batch: 184371

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	20.37		mg/L		102	90 - 110
Sulfate	20.0	19.71		mg/L		99	90 - 110

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 480-184978/123
Matrix: Water
Analysis Batch: 184978

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.020	0.0090	mg/L			05/30/14 15:43	1

Lab Sample ID: MB 480-184978/27
Matrix: Water
Analysis Batch: 184978

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.020	0.0090	mg/L			05/30/14 14:19	1

Lab Sample ID: MB 480-184978/3
Matrix: Water
Analysis Batch: 184978

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.020	0.0090	mg/L			05/30/14 13:59	1

Lab Sample ID: LCS 480-184978/124
Matrix: Water
Analysis Batch: 184978

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	1.08		mg/L		108	90 - 110

Lab Sample ID: LCS 480-184978/28
Matrix: Water
Analysis Batch: 184978

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	1.08		mg/L		108	90 - 110

Lab Sample ID: LCS 480-184978/4
Matrix: Water
Analysis Batch: 184978

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	1.08		mg/L		108	90 - 110

Method: 353.2 - Nitrogen, Nitrite

Lab Sample ID: MB 480-183946/3
Matrix: Water
Analysis Batch: 183946

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrite	0.0375	J	0.050	0.020	mg/L			05/23/14 23:25	1

Lab Sample ID: MB 480-183946/32
Matrix: Water
Analysis Batch: 183946

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrite	ND		0.050	0.020	mg/L			05/23/14 23:57	1

Lab Sample ID: LCS 480-183946/33
Matrix: Water
Analysis Batch: 183946

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrite	1.50	1.59		mg/L		106	90 - 110

Lab Sample ID: LCS 480-183946/4
Matrix: Water
Analysis Batch: 183946

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrite	1.50	1.61		mg/L		107	90 - 110

Method: 9060A - Organic Carbon, Total (TOC)

Lab Sample ID: MB 480-184910/16
Matrix: Water
Analysis Batch: 184910

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		1.0	0.43	mg/L			05/29/14 01:38	1

Lab Sample ID: LCS 480-184910/17
Matrix: Water
Analysis Batch: 184910

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	60.0	59.34		mg/L		99	90 - 110

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 480-184244/30
Matrix: Water
Analysis Batch: 184244

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity	1.32	J	5.0	0.79	mg/L			05/27/14 15:08	1

Method: SM 2320B - Alkalinity (Continued)

Lab Sample ID: MB 480-184244/6
Matrix: Water
Analysis Batch: 184244

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity	1.29	J	5.0	0.79	mg/L			05/27/14 12:11	1

Lab Sample ID: LCS 480-184244/31
Matrix: Water
Analysis Batch: 184244

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Alkalinity	100	95.21		mg/L		95	90 - 110

Lab Sample ID: LCS 480-184244/7
Matrix: Water
Analysis Batch: 184244

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Alkalinity	100	95.27		mg/L		95	90 - 110

Method: SM 4500 S2 D - Sulfide, Total

Lab Sample ID: MB 480-184215/27
Matrix: Water
Analysis Batch: 184215

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		0.10	0.052	mg/L			05/27/14 12:00	1

Lab Sample ID: MB 480-184215/3
Matrix: Water
Analysis Batch: 184215

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		0.10	0.052	mg/L			05/27/14 12:00	1

Lab Sample ID: LCS 480-184215/28
Matrix: Water
Analysis Batch: 184215

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfide	0.750	0.676		mg/L		90	90 - 110

Lab Sample ID: LCS 480-184215/4
Matrix: Water
Analysis Batch: 184215

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfide	0.750	0.756		mg/L		101	90 - 110

GC/MS VOA

Analysis Batch: 185288

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60502-1	MW-14-052314	Total/NA	Water	8260C	
LCS 480-185288/5	Lab Control Sample	Total/NA	Water	8260C	
MB 480-185288/7	Method Blank	Total/NA	Water	8260C	

GC VOA

Analysis Batch: 72919

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60502-1	MW-14-052314	Total/NA	Water	RSK-175	
LCS 200-72919/2	Lab Control Sample	Total/NA	Water	RSK-175	
MB 200-72919/3	Method Blank	Total/NA	Water	RSK-175	

Analysis Batch: 184085

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60502-1	MW-14-052314	Total/NA	Water	RSK-175	
LCS 480-184085/4	Lab Control Sample	Total/NA	Water	RSK-175	
LCSD 480-184085/5	Lab Control Sample Dup	Total/NA	Water	RSK-175	
MB 480-184085/3	Method Blank	Total/NA	Water	RSK-175	

Analysis Batch: 187622

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60502-1	MW-14-052314	Total/NA	Water	AM20GAX	

Metals

Prep Batch: 184063

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60502-1	MW-14-052314	Total/NA	Water	3005A	
LCS 480-184063/2-A	Lab Control Sample	Total/NA	Water	3005A	
MB 480-184063/1-A	Method Blank	Total/NA	Water	3005A	

Analysis Batch: 184294

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60502-1	MW-14-052314	Total/NA	Water	6010C	184063
LCS 480-184063/2-A	Lab Control Sample	Total/NA	Water	6010C	184063
MB 480-184063/1-A	Method Blank	Total/NA	Water	6010C	184063

General Chemistry

Analysis Batch: 183946

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60502-1	MW-14-052314	Total/NA	Water	353.2	
LCS 480-183946/33	Lab Control Sample	Total/NA	Water	353.2	
LCS 480-183946/4	Lab Control Sample	Total/NA	Water	353.2	
MB 480-183946/3	Method Blank	Total/NA	Water	353.2	
MB 480-183946/32	Method Blank	Total/NA	Water	353.2	

Analysis Batch: 183947

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60502-1	MW-14-052314	Total/NA	Water	353.2	

General Chemistry (Continued)

Analysis Batch: 184215

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60502-1	MW-14-052314	Total/NA	Water	SM 4500 S2 D	
LCS 480-184215/28	Lab Control Sample	Total/NA	Water	SM 4500 S2 D	
LCS 480-184215/4	Lab Control Sample	Total/NA	Water	SM 4500 S2 D	
MB 480-184215/27	Method Blank	Total/NA	Water	SM 4500 S2 D	
MB 480-184215/3	Method Blank	Total/NA	Water	SM 4500 S2 D	

Analysis Batch: 184244

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60502-1	MW-14-052314	Total/NA	Water	SM 2320B	
LCS 480-184244/31	Lab Control Sample	Total/NA	Water	SM 2320B	
LCS 480-184244/7	Lab Control Sample	Total/NA	Water	SM 2320B	
MB 480-184244/30	Method Blank	Total/NA	Water	SM 2320B	
MB 480-184244/6	Method Blank	Total/NA	Water	SM 2320B	

Analysis Batch: 184371

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60502-1	MW-14-052314	Total/NA	Water	300.0	
LCS 480-184371/3	Lab Control Sample	Total/NA	Water	300.0	
MB 480-184371/4	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 184910

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60502-1	MW-14-052314	Total/NA	Water	9060A	
LCS 480-184910/17	Lab Control Sample	Total/NA	Water	9060A	
MB 480-184910/16	Method Blank	Total/NA	Water	9060A	

Analysis Batch: 184978

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60502-1	MW-14-052314	Total/NA	Water	350.1	
LCS 480-184978/124	Lab Control Sample	Total/NA	Water	350.1	
LCS 480-184978/28	Lab Control Sample	Total/NA	Water	350.1	
LCS 480-184978/4	Lab Control Sample	Total/NA	Water	350.1	
MB 480-184978/123	Method Blank	Total/NA	Water	350.1	
MB 480-184978/27	Method Blank	Total/NA	Water	350.1	
MB 480-184978/3	Method Blank	Total/NA	Water	350.1	

Lab Chronicle

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60502-1

Client Sample ID: MW-14-052314
Date Collected: 05/23/14 11:45
Date Received: 05/23/14 16:45

Lab Sample ID: 480-60502-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	185288	06/03/14 03:42	RAS	TAL BUF
Total/NA	Analysis	AM20GAX		1	187622	06/05/14 14:57	CTB	SC0015
Total/NA	Analysis	RSK-175		1	72919	06/02/14 15:11	NEA	TAL BUR
Total/NA	Analysis	RSK-175		1	184085	05/27/14 12:56	DLE	TAL BUF
Total/NA	Prep	3005A			184063	05/27/14 09:25	EHD	TAL BUF
Total/NA	Analysis	6010C		1	184294	05/27/14 18:45	MTM2	TAL BUF
Total/NA	Analysis	300.0		10	184371	05/28/14 17:10	KRC	TAL BUF
Total/NA	Analysis	350.1		1	184978	05/30/14 14:22	RS	TAL BUF
Total/NA	Analysis	353.2		1	183946	05/24/14 00:01	KS	TAL BUF
Total/NA	Analysis	353.2		1	183947	05/24/14 00:01	KS	TAL BUF
Total/NA	Analysis	9060A		1	184910	05/29/14 07:10	KRC	TAL BUF
Total/NA	Analysis	SM 2320B		1	184244	05/27/14 16:48	VAJ	TAL BUF
Total/NA	Analysis	SM 4500 S2 D		1	184215	05/27/14 12:00	EGS	TAL BUF

Laboratory References:

SC0015 = Pittsburgh, PA (formerly Microseeps), 220 William Pitt Way, Pittsburgh, PA 15238, TEL (412)826-5245

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL BUR = TestAmerica Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Certification Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60502-1

Laboratory: TestAmerica Buffalo

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0686	07-06-14
California	State Program	9	1169CA	09-30-14
Connecticut	State Program	1	PH-0568	09-30-14
Florida	NELAP	4	E87672	06-30-14 *
Georgia	State Program	4	N/A	03-31-15
Illinois	NELAP	5	200003	09-30-14
Iowa	State Program	7	374	03-01-15
Kansas	NELAP	7	E-10187	01-31-15
Kentucky (DW)	State Program	4	90029	12-31-14
Kentucky (UST)	State Program	4	30	03-31-15
Louisiana	NELAP	6	02031	06-30-14 *
Maine	State Program	1	NY00044	12-04-14
Maryland	State Program	3	294	03-31-15
Massachusetts	State Program	1	M-NY044	06-30-14 *
Michigan	State Program	5	9937	03-31-15
Minnesota	NELAP	5	036-999-337	12-31-14
New Hampshire	NELAP	1	2337	11-17-14
New Jersey	NELAP	2	NY455	06-30-14
New York	NELAP	2	10026	03-31-15
North Dakota	State Program	8	R-176	03-31-14 *
Oklahoma	State Program	6	9421	08-31-14
Oregon	NELAP	10	NY200003	06-09-15
Pennsylvania	NELAP	3	68-00281	07-31-14
Rhode Island	State Program	1	LAO00328	12-30-14
Tennessee	State Program	4	TN02970	03-31-15
Texas	NELAP	6	T104704412-11-2	07-31-14
USDA	Federal		P330-11-00386	11-22-14
Virginia	NELAP	3	460185	09-14-14
Washington	State Program	10	C784	02-10-15
Wisconsin	State Program	5	998310390	08-31-14

Laboratory: TestAmerica Burlington

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Connecticut	State Program	1	PH-0751	09-30-15
DE Haz. Subst. Cleanup Act (HSCA)	State Program	3	NA	02-13-15
Florida	NELAP	4	E87467	06-30-14 *
L-A-B	DoD ELAP		L2336	02-26-17
Louisiana	NELAP	6	176292	06-30-14
Maine	State Program	1	VT00008	04-17-15
Minnesota	NELAP	5	050-999-436	12-31-14
New Hampshire	NELAP	1	2006	12-18-14
New Jersey	NELAP	2	VT972	06-30-14 *
New York	NELAP	2	10391	03-31-15
Pennsylvania	NELAP	3	68-00489	04-30-15
Rhode Island	State Program	1	LAO00298	12-30-14
US Fish & Wildlife	Federal		LE-058448-0	02-28-15
USDA	Federal		P330-11-00093	10-28-16
Vermont	State Program	1	VT-4000	12-31-14

* Certification renewal pending - certification considered valid.

Certification Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60502-1

Laboratory: TestAmerica Burlington (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Virginia	NELAP	3	460209	12-14-14

Method Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60502-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	TAL BUF
AM20GAX	Dissolved Gases (GC)	NONE	SC0015
RSK-175	Dissolved Gases (GC)	RSK	TAL BUR
RSK-175	Dissolved Gases (GC)	RSK	TAL BUF
6010C	Metals (ICP)	SW846	TAL BUF
300.0	Anions, Ion Chromatography	MCAWW	TAL BUF
350.1	Nitrogen, Ammonia	MCAWW	TAL BUF
353.2	Nitrogen, Nitrite	MCAWW	TAL BUF
353.2	Nitrate	EPA	TAL BUF
9060A	Organic Carbon, Total (TOC)	SW846	TAL BUF
SM 2320B	Alkalinity	SM	TAL BUF
SM 4500 S2 D	Sulfide, Total	SM	TAL BUF

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

NONE = NONE

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

SC0015 = Pittsburgh, PA (formerly Microseeps), 220 William Pitt Way, Pittsburgh, PA 15238, TEL (412)826-5245

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL BUR = TestAmerica Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Sample Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60502-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-60502-1	MW-14-052314	Water	05/23/14 11:45	05/23/14 16:45

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

June 6, 2014

Melissa Deyo
Test America
10 Hazelwood Drive
Buffalo, NY 14228

RE: **GM-Lockport / 480-60502-1**
Microseeps Workorder: 12305

Dear Melissa Deyo:

Enclosed are the analytical results for sample(s) received by the laboratory on Friday, May 30, 2014. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Robbin Robl 06/06/2014
rrobl@microseeps.com

Customer Service Representative

Enclosures

As a valued client we would appreciate your comments on our service.
Please email info@microseeps.com.

Total Number of Pages 10

CERTIFICATE OF ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

LABORATORY ACCREDITATIONS & CERTIFICATIONS

Accreditor:	Pennsylvania Department of Environmental Protection, Bureau of Laboratories
Accreditation ID:	02-00538
Scope:	NELAP Non-Potable Water and Solid & Hazardous Waste
Accreditor:	NELAP: State of Florida, Department of Health, Bureau of Laboratories
Accreditation ID:	E87832
Scope:	Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)
Accreditor:	South Carolina Department of Health and Environmental Control, Office of Environmental Laboratory Certification
Accreditation ID:	89009003
Scope:	Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA)
Accreditor:	NELAP: State of Louisiana, Department of Environmental Quality
Accreditation ID:	04104
Scope:	Solid and Chemical Materials; Non-Potable Water
Accreditor:	NELAP: New Jersey, Department of Environmental Protection
Accreditation ID:	PA026
Scope:	Non-Potable Water; Solid and Chemical Materials
Accreditor:	NELAP: New York, Department of Health Wadsworth Center
Accreditation ID:	11815
Scope:	Non-Potable Water; Solid and Hazardous Waste
Accreditor:	State of Connecticut, Department of Public Health, Division of Environmental Health
Accreditation ID:	PH-0263
Scope:	Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)
Accreditor:	NELAP: Texas, Commission on Environmental Quality
Accreditation ID:	T104704453-09-TX
Scope:	Non-Potable Water
Accreditor:	State of New Hampshire
Accreditation ID:	299409
Scope:	Non-potable water
Accreditor:	State of Georgia
Accreditation ID:	Chapter 391-3-26
Scope:	As per the Georgia EPD Rules and Regulations for Commercial Laboratories, Microseeps is accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

SAMPLE SUMMARY

Workorder: 12305 GM-Lockport / 480-60502-1

Lab ID	Sample ID	Matrix	Date Collected	Date Received
123050001	MW-14-052314(480-60502-1)	Bubble Strip	5/23/2014 12:00	5/30/2014 13:50

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 12305 GM-Lockport / 480-60502-1

Lab ID: **123050001** Date Received: 5/30/2014 13:50 Matrix: Bubble Strip

Sample ID: **MW-14-052314(480-60502-1)** Date Collected: 5/23/2014 12:00

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
RISK - MICR										
Analysis Desc: AM20GAX			Analytical Method: AM20GAX							
Hydrogen	**2.3**	nM	0.60	0.13	1			6/5/2014 14:57	MM	

CERTIFICATE OF ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS QUALIFIERS

Workorder: 12305 GM-Lockport / 480-60502-1

DEFINITIONS/QUALIFIERS

Disclaimer :	The Pennsylvania Department of Environmental Protection (PADEP) has decided to no longer recognize analyses that do not produce data for primary compliance, for NELAP accreditation. The methods affected by this decision are AM20GAx, AM21G, SW846 7199 and AM4.02. The laboratory shall continue to administer the NELAP/TNI standard requirements in the performance of these methods.
MDL	Method Detection Limit. Can be used synonymously with LOD; Limit Of Detection.
PQL	Practical Quanitation Limit. Can be used synonymously with LOQ; Limit Of Quantitation.
ND	Not detected at or above reporting limit.
DF	Dilution Factor.
S	Surrogate.
RPD	Relative Percent Difference.
% Rec	Percent Recovery.
U	Indicates the compound was analyzed for, but not detected at or above the noted concentration.
J	Estimated concentration greater than the set method detection limit (MDL) and less than the set reporting limit (PQL).

CERTIFICATE OF ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

QUALITY CONTROL DATA

Workorder: 12305 GM-Lockport / 480-60502-1

QC Batch: DISG/3824 Analysis Method: AM20GAX

QC Batch Method: AM20GAX

Associated Lab Samples: 123050001

METHOD BLANK: 28213

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Hydrogen	nM	0.60 U	0.60	

LABORATORY CONTROL SAMPLE & LCSD: 28214 28215

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
RISK										
Hydrogen	nM	12	11	11	93	94	80-120	1.1	20	

CERTIFICATE OF ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 12305 GM-Lockport / 480-60502-1

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
123050001	MW-14-052314(480-60502-1)			AM20GAX	DISG/3824

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

12305

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Deyo, Melissa L	Carrier Tracking No(s):	COC No: 480-16586.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: melissa.deyo@testamericainc.com		Page: Page 1 of 1
Company: Pace Analytical Services, Inc.		Analysis Requested		Job #: 480-60502-1
Address: 220 William Pitt Way,	Due Date Requested: 6/5/2014			Preservation Codes:
City: Pittsburgh	TAT Requested (days):			A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
State, Zip: PA, 15238				
Phone: 412-826-5245(Tel)	PO #:			Other:
Email:	WO #:			
Project Name: 058507, GM-Lockport Groundwater Sampling	Project #: 48004014			
Site:	SSOW#:			

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	AM20GAX/ Hydrogen	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
MW-14-052314 (480-60502-1)	5/23/14	11:45 Eastern		Water			X	1	

Possible Hazard Identification
Unconfirmed
Deliverable Requested: I, II, III, IV, Other (specify)

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:				
Relinquished by:	Date/Time: 5/27/14 1700	Company TA Buff.	Received by: Pace	Date/Time: 5/28/14 9:50	Company Pace
Relinquished by: Pace	Date/Time: 5/27/14 9:50	Company Pace	Received by: Alyna R. Mudroney	Date/Time: 5/29/14 1000	Company Pace
Relinquished by: Pace	Date/Time: 5/30/14 13:50	Company	Received by:	Date/Time: 5.30 14 1350	Company PAES
Custody Seals Intact: (Δ Yes Δ No)	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: 0.10		

6/13/2014

NON-CONFORMANCE FORM

Microseeps Project Number: 12305

Date: 5.30.14 Time of Receipt: 1350 Receiver: LY

Client: TA Buffalo

REASON FOR NON-CONFORMANCE:

Vial time 12:00

COC time 11 45

ACTION TAKEN:

Client name: Melissa Deyo/ TA Date: 6.2.14 Time: email

Client is aware. use 12:00. O.K. TO Proceed.

Customer Service Initials: LY Date: 6.2.14

Chris Thomas

From: Deyo, Melissa <Melissa.Deyo@testamericainc.com>
Sent: Monday, June 02, 2014 2:00 PM
To: Chris Thomas
Subject: RE: 058507 GM LOCKPORT GROUNDWATER SAMPLING

Please use 12:00.

MELISSA DEYO
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

10 Hazelwood Drive
Amherst, NY 14228
Tel 716.504.9874 | Fax 716.691.7991
www.testamericainc.com

From: Chris Thomas [mailto:CThomas@microseeps.com]
Sent: Monday, June 02, 2014 1:55 PM
To: Deyo, Melissa
Subject: 058507 GM LOCKPORT GROUNDWATER SAMPLING

Melissa,

We received samples for the 058507 GM LOCKPORT GROUNDWATER SAMPLING project. I have attached a copy of the COC. The time on the vial was 12:00 but the time on the COC 11:45. If you could please let us know what time to use we can proceed with the analysis.

Thanks,
Chris

Christopher Thomas
Microseeps, a Division of Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238

Office: 412-826-5245
Direct: 412-826-4481

Disclaimer: This message contains confidential information and is intended only for the individual(s) named. If you are not the named addressee, you should permanently delete this e-mail from your system and should not disseminate, distribute or copy this e-mail. E-mail transmission cannot be guaranteed to be secure or error-free as information delivered over the internet could be corrupted, lost, destroyed, delayed, or contain viruses

TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: T. Bohlen	Lab PM: Deyo, Melissa L	Carrier Tracking No(s):	COC No: 480-49375-13138.4
Client Contact: Mr. Tom Bohlen	Phone: 716 685-2300	E-Mail: melissa.deyo@testamericainc.com		Page: Page 4 of 4
Company: GZA GeoEnvironmental, Inc.				Job #:
Address: 535 Washington Street 11th Floor	Due Date Requested:			
City: Buffalo	TAT Requested (days):			
State, Zip: NY, 14203				
Phone:	PO #: 4062165			
Email: thomas.bohlen@gza.com	WO #: 58507			
Project Name: 058507, GM-Lockport Groundwater Sampling	Project #: 48004014			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2SO3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - ph 4-5
Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	RSK_175_CO2 - Carbon dioxide	350.1 - Ammonia	6010B - Metals - Fe, Mn, Mg	8260B - PCE, TCE, DCE (trans and cis), Vinyl Chl	9060 - Total Organic Carbon	RSK_175 - Methane, Ethane, Ethene	SM4500_S2_D - Sulfide	353.2, 353.2_Nitrite, Nitrate_Calc	2320B - Total Alkalinity	300.0_28D - Anions (Chloride & Sulfate)		AM 20 GAX	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	S	D	A	A	A	GL	N	N	N				
MW-14-052314	5/23/14	1145	G	Water	N	N	X	X	X	X	X	X	X	X	X	X		*		* Dissolved H_2 for Microseeps
				Water																
				Water																
				Water																
				Water																
				Water																

480-60502 Chain of Custody

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological	☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	Thomas Bohlen	5/23/14 1645	GZA		5-23-14 1645	TAB
	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 5.2 #1

6/13/2014

Login Sample Receipt Checklist

Client: Conestoga-Rovers & Associates, Inc.

Job Number: 480-60502-1

Login Number: 60502

List Source: TestAmerica Buffalo

List Number: 1

Creator: Kolb, Chris M

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	gza
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	

Login Sample Receipt Checklist

Client: Conestoga-Rovers & Associates, Inc.

Job Number: 480-60502-1

Login Number: 60502
List Number: 2
Creator: Gagne, Eric M

List Source: TestAmerica Burlington
List Creation: 05/28/14 02:56 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	877530 & 540
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	2.6ºC & 4.8ºC. IR GUN ID 181. CF = 0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	No SAMPLE TIMES ON CONTAINER LABELS.
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

TestAmerica Job ID: 480-60857-1

Client Project/Site: 058507, GM-Lockport Groundwater Sampling

For:

Conestoga-Rovers & Associates, Inc.
2055 Niagara Falls Blvd., Suite 3
Niagara Falls, New York 14304

Attn: Kathleen Willy

Authorized for release by:
6/13/2014 10:52:10 AM
Rebecca Jones, Project Management Assistant I
rebecca.jones@testamericainc.com

Designee for

Melissa Deyo, Project Manager I
(716)504-9874
melissa.deyo@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Cover Page 1
Table of Contents 2
Definitions/Glossary 3
Case Narrative 4
Detection Summary 5
Client Sample Results 6
Surrogate Summary 7
QC Sample Results 8
QC Association Summary 14
Lab Chronicle 16
Certification Summary 17
Method Summary 19
Sample Summary 20
Chain of Custody 21
Receipt Checklists 22

Definitions/Glossary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60857-1

Qualifiers

GC VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
F3	Duplicate RPD exceeds the control limit
F1	MS and/or MSD Recovery exceeds the control limits
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC exceeds the control limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 480-60857-1

Laboratory: TestAmerica Buffalo

Narrative

Job Narrative
480-60857-1

Receipt
The sample was received on 5/30/2014 2:10 PM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.6º C.

GC/MS VOA
Method(s) 8260C: The following sample(s) was diluted to bring the concentration of target analytes within the calibration range: MW-7-053014 (480-60857-1). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

IC
Method(s) 300.0: The following sample(s) was diluted to bring the concentration of target analytes within the calibration range: (480-60857-1 MS), (480-60857-1 MSD), MW-7-053014 (480-60857-1). Elevated reporting limits (RLs) are provided.

Method(s) 300.0: The following sample(s) was diluted to bring the concentration of target analytes within the calibration range: MW-7-053014 (480-60857-1). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC VOA
Method(s) RSK-175: The following sample was diluted to bring the concentration of target analytes within the calibration range: MW-7-053014 (480-60857-1). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
Method(s) 9060A: The matrix spike / matrix spike duplicate / sample duplicate (MS/MSD/DUP) precision for batch 18052 was outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample / laboratory control sample duplicate (LCS/LCSD) precision was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60857-1

Client Sample ID: MW-7-053014

Lab Sample ID: 480-60857-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	46000		20000	16000	ug/L	20000		8260C	Total/NA
Trichloroethene	880000		20000	9200	ug/L	20000		8260C	Total/NA
Ethene	48		35	7.5	ug/L	5		RSK-175	Total/NA
Methane	9.0	J	20	5.0	ug/L	5		RSK-175	Total/NA
Magnesium	34.7		0.20	0.043	mg/L	1		6010C	Total/NA
Manganese	0.0088		0.0030	0.00040	mg/L	1		6010C	Total/NA
Chloride	292		2.5	1.4	mg/L	5		300.0	Total/NA
Sulfate	138		10.0	1.7	mg/L	5		300.0	Total/NA
Ammonia	0.43		0.020	0.0090	mg/L	1		350.1	Total/NA
Total Organic Carbon	5.4		1.0	0.43	mg/L	1		9060A	Total/NA
Total Alkalinity	258		5.0	0.79	mg/L	1		SM 2320B	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Carbon dioxide	4300		1000	1000	ug/L	1		RSK-175	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-7-053014

Date Collected: 05/30/14 12:40
Date Received: 05/30/14 14:10

Lab Sample ID: 480-60857-1

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	**46000**		20000	16000	ug/L			06/11/14 13:30	20000
Tetrachloroethene	ND		20000	7200	ug/L			06/11/14 13:30	20000
trans-1,2-Dichloroethene	ND		20000	18000	ug/L			06/11/14 13:30	20000
Trichloroethene	**880000**		20000	9200	ug/L			06/11/14 13:30	20000
Vinyl chloride	ND		20000	18000	ug/L			06/11/14 13:30	20000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*76*		*66 - 137*		*06/11/14 13:30*	*20000*
4-Bromofluorobenzene (Surr)	*114*		*73 - 120*		*06/11/14 13:30*	*20000*
Toluene-d8 (Surr)	*82*		*71 - 126*		*06/11/14 13:30*	*20000*
Dibromofluoromethane (Surr)	*87*		*60 - 140*		*06/11/14 13:30*	*20000*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	ND		38	7.5	ug/L			06/02/14 13:18	5
Ethene	**48**		35	7.5	ug/L			06/02/14 13:18	5
Methane	**9.0**	**J**	20	5.0	ug/L			06/02/14 13:18	5

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon dioxide	**4300**		1000	1000	ug/L			06/04/14 15:21	1

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.050	0.019	mg/L		06/03/14 09:05	06/04/14 16:45	1
Magnesium	**34.7**		0.20	0.043	mg/L		06/03/14 09:05	06/04/14 16:45	1
Manganese	**0.0088**		0.0030	0.00040	mg/L		06/03/14 09:05	06/04/14 16:45	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**292**		2.5	1.4	mg/L			06/03/14 23:23	5
Sulfate	**138**		10.0	1.7	mg/L			06/05/14 17:37	5
Ammonia	**0.43**		0.020	0.0090	mg/L			06/03/14 18:19	1
Nitrate	ND		0.050	0.020	mg/L			05/30/14 18:23	1
Nitrite	ND		0.050	0.020	mg/L			05/30/14 18:23	1
Total Organic Carbon	**5.4**		1.0	0.43	mg/L			06/05/14 13:24	1
Total Alkalinity	**258**		5.0	0.79	mg/L			06/02/14 11:10	1
Sulfide	ND		0.10	0.052	mg/L			06/03/14 13:49	1

Surrogate Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60857-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		12DCE	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(66-137)	(73-120)	(71-126)	(60-140)
480-60857-1	MW-7-053014	76	114	82	87
LCS 480-186995/4	Lab Control Sample	93	113	87	86
LCSD 480-186995/5	Lab Control Sample Dup	91	116	85	86
MB 480-186995/7	Method Blank	79	108	82	90

Surrogate Legend

12DCE = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 480-186995/7
Matrix: Water
Analysis Batch: 186995

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			06/11/14 12:53	1
Tetrachloroethene	ND		1.0	0.36	ug/L			06/11/14 12:53	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			06/11/14 12:53	1
Trichloroethene	ND		1.0	0.46	ug/L			06/11/14 12:53	1
Vinyl chloride	ND		1.0	0.90	ug/L			06/11/14 12:53	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 137*		*06/11/14 12:53*	*1*
4-Bromofluorobenzene (Surr)	*108*		*73 - 120*		*06/11/14 12:53*	*1*
Toluene-d8 (Surr)	*82*		*71 - 126*		*06/11/14 12:53*	*1*
Dibromofluoromethane (Surr)	*90*		*60 - 140*		*06/11/14 12:53*	*1*

Lab Sample ID: LCS 480-186995/4
Matrix: Water
Analysis Batch: 186995

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
cis-1,2-Dichloroethene			25.0	26.4		ug/L		106	74 - 124		
Tetrachloroethene			25.0	26.3		ug/L		105	74 - 122		
trans-1,2-Dichloroethene			25.0	25.7		ug/L		103	73 - 127		
Trichloroethene			25.0	27.6		ug/L		110	74 - 123		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*66 - 137*
4-Bromofluorobenzene (Surr)	*113*		*73 - 120*
Toluene-d8 (Surr)	*87*		*71 - 126*
Dibromofluoromethane (Surr)	*86*		*60 - 140*

Lab Sample ID: LCSD 480-186995/5
Matrix: Water
Analysis Batch: 186995

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
cis-1,2-Dichloroethene			25.0	25.2		ug/L		101	74 - 124	5	15
Tetrachloroethene			25.0	24.9		ug/L		100	74 - 122	6	20
trans-1,2-Dichloroethene			25.0	24.9		ug/L		100	73 - 127	3	20
Trichloroethene			25.0	26.4		ug/L		106	74 - 123	4	16

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*91*		*66 - 137*
4-Bromofluorobenzene (Surr)	*116*		*73 - 120*
Toluene-d8 (Surr)	*85*		*71 - 126*
Dibromofluoromethane (Surr)	*86*		*60 - 140*

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60857-1

Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 480-185084/3
Matrix: Water
Analysis Batch: 185084

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	ND		7.5	1.5	ug/L			06/02/14 08:31	1
Ethene	ND		7.0	1.5	ug/L			06/02/14 08:31	1
Methane	ND		4.0	1.0	ug/L			06/02/14 08:31	1

Lab Sample ID: LCS 480-185084/4
Matrix: Water
Analysis Batch: 185084

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ethane	14.6	14.9		ug/L		102	52 - 138
Ethene	13.5	13.5		ug/L		101	50 - 137
Methane	7.69	7.75		ug/L		101	48 - 174

Lab Sample ID: LCSD 480-185084/5
Matrix: Water
Analysis Batch: 185084

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ethane	14.6	14.2		ug/L		98	52 - 138	4	50
Ethene	13.5	12.8		ug/L		95	50 - 137	6	50
Methane	7.69	7.52		ug/L		98	48 - 174	3	50

Lab Sample ID: MB 200-73077/3
Matrix: Water
Analysis Batch: 73077

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon dioxide	ND		1000	1000	ug/L			06/04/14 14:13	1

Lab Sample ID: LCS 200-73077/2
Matrix: Water
Analysis Batch: 73077

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Carbon dioxide	5010	5240		ug/L		105	70 - 130

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 480-185098/1-A
Matrix: Water
Analysis Batch: 185827

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 185098

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.050	0.019	mg/L		06/03/14 09:05	06/04/14 15:36	1
Magnesium	ND		0.20	0.043	mg/L		06/03/14 09:05	06/04/14 15:36	1
Manganese	ND		0.0030	0.00040	mg/L		06/03/14 09:05	06/04/14 15:36	1

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: LCS 480-185098/2-A
Matrix: Water
Analysis Batch: 185827

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 185098

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	10.0	9.95		mg/L		100	80 - 120
Magnesium	10.0	10.43		mg/L		104	80 - 120
Manganese	0.200	0.204		mg/L		102	80 - 120

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 480-185423/28
Matrix: Water
Analysis Batch: 185423

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			06/03/14 20:21	1
Sulfate	ND	^	2.0	0.35	mg/L			06/03/14 20:21	1

Lab Sample ID: LCS 480-185423/27
Matrix: Water
Analysis Batch: 185423

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	19.65		mg/L		98	90 - 110
Sulfate	20.0	19.08	^	mg/L		95	90 - 110

Lab Sample ID: 480-60857-1 MS
Matrix: Water
Analysis Batch: 185423

Client Sample ID: MW-7-053014
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	292		125	425.5		mg/L		107	90 - 110

Lab Sample ID: 480-60857-1 MSD
Matrix: Water
Analysis Batch: 185423

Client Sample ID: MW-7-053014
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	292		125	427.8		mg/L		109	90 - 110	1	20

Lab Sample ID: MB 480-185887/4
Matrix: Water
Analysis Batch: 185887

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			06/05/14 15:15	1
Sulfate	ND		2.0	0.35	mg/L			06/05/14 15:15	1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 480-185887/3
Matrix: Water
Analysis Batch: 185887

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	19.48		mg/L		97	90 - 110
Sulfate	20.0	19.60		mg/L		98	90 - 110

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 480-185494/27
Matrix: Water
Analysis Batch: 185494

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.020	0.0090	mg/L			06/03/14 18:02	1

Lab Sample ID: LCS 480-185494/28
Matrix: Water
Analysis Batch: 185494

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	1.03		mg/L		103	90 - 110

Lab Sample ID: 480-60857-1 MS
Matrix: Water
Analysis Batch: 185494

Client Sample ID: MW-7-053014
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	0.43		0.200	0.439	F1	mg/L		4	90 - 110

Lab Sample ID: 480-60857-1 DU
Matrix: Water
Analysis Batch: 185494

Client Sample ID: MW-7-053014
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Ammonia	0.43		0.428		mg/L		0.9	20

Method: 9060A - Organic Carbon, Total (TOC)

Lab Sample ID: MB 480-186052/28
Matrix: Water
Analysis Batch: 186052

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		1.0	0.43	mg/L			06/05/14 10:53	1

Lab Sample ID: MB 480-186052/3
Matrix: Water
Analysis Batch: 186052

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		1.0	0.43	mg/L			06/04/14 17:12	1

Method: 9060A - Organic Carbon, Total (TOC) (Continued)

Lab Sample ID: LCS 480-186052/29
Matrix: Water
Analysis Batch: 186052

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	60.0	60.88		mg/L		101	90 - 110

Lab Sample ID: LCS 480-186052/4
Matrix: Water
Analysis Batch: 186052

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	60.0	60.63		mg/L		101	90 - 110

Lab Sample ID: 480-60857-1 DU
Matrix: Water
Analysis Batch: 186052

Client Sample ID: MW-7-053014
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Organic Carbon	5.4		4.25	F3	mg/L		23	20

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 480-185231/30
Matrix: Water
Analysis Batch: 185231

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity	ND		5.0	0.79	mg/L			06/02/14 13:10	1

Lab Sample ID: MB 480-185231/6
Matrix: Water
Analysis Batch: 185231

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity	ND		5.0	0.79	mg/L			06/02/14 10:25	1

Lab Sample ID: LCS 480-185231/31
Matrix: Water
Analysis Batch: 185231

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Alkalinity	100	95.07		mg/L		95	90 - 110

Lab Sample ID: LCS 480-185231/7
Matrix: Water
Analysis Batch: 185231

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Alkalinity	100	95.34		mg/L		95	90 - 110

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60857-1

Method: SM 4500 S2 D - Sulfide, Total

Lab Sample ID: MB 480-185455/41
Matrix: Water
Analysis Batch: 185455

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		0.10	0.052	mg/L			06/03/14 13:27	1

Lab Sample ID: LCS 480-185455/42
Matrix: Water
Analysis Batch: 185455

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfide			0.750	0.719		mg/L		96	90 - 110		

GC/MS VOA

Analysis Batch: 186995

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60857-1	MW-7-053014	Total/NA	Water	8260C	
LCS 480-186995/4	Lab Control Sample	Total/NA	Water	8260C	
LCSD 480-186995/5	Lab Control Sample Dup	Total/NA	Water	8260C	
MB 480-186995/7	Method Blank	Total/NA	Water	8260C	

GC VOA

Analysis Batch: 73077

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60857-1	MW-7-053014	Total/NA	Water	RSK-175	
LCS 200-73077/2	Lab Control Sample	Total/NA	Water	RSK-175	
MB 200-73077/3	Method Blank	Total/NA	Water	RSK-175	

Analysis Batch: 185084

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60857-1	MW-7-053014	Total/NA	Water	RSK-175	
LCS 480-185084/4	Lab Control Sample	Total/NA	Water	RSK-175	
LCSD 480-185084/5	Lab Control Sample Dup	Total/NA	Water	RSK-175	
MB 480-185084/3	Method Blank	Total/NA	Water	RSK-175	

Metals

Prep Batch: 185098

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60857-1	MW-7-053014	Total/NA	Water	3005A	
LCS 480-185098/2-A	Lab Control Sample	Total/NA	Water	3005A	
MB 480-185098/1-A	Method Blank	Total/NA	Water	3005A	

Analysis Batch: 185827

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60857-1	MW-7-053014	Total/NA	Water	6010C	185098
LCS 480-185098/2-A	Lab Control Sample	Total/NA	Water	6010C	185098
MB 480-185098/1-A	Method Blank	Total/NA	Water	6010C	185098

General Chemistry

Analysis Batch: 184999

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60857-1	MW-7-053014	Total/NA	Water	353.2	

Analysis Batch: 185000

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60857-1	MW-7-053014	Total/NA	Water	353.2	

Analysis Batch: 185231

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60857-1	MW-7-053014	Total/NA	Water	SM 2320B	
LCS 480-185231/31	Lab Control Sample	Total/NA	Water	SM 2320B	
LCS 480-185231/7	Lab Control Sample	Total/NA	Water	SM 2320B	
MB 480-185231/30	Method Blank	Total/NA	Water	SM 2320B	

General Chemistry (Continued)

Analysis Batch: 185231 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 480-185231/6	Method Blank	Total/NA	Water	SM 2320B	

Analysis Batch: 185423

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60857-1	MW-7-053014	Total/NA	Water	300.0	
480-60857-1 MS	MW-7-053014	Total/NA	Water	300.0	
480-60857-1 MSD	MW-7-053014	Total/NA	Water	300.0	
LCS 480-185423/27	Lab Control Sample	Total/NA	Water	300.0	
MB 480-185423/28	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 185455

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60857-1	MW-7-053014	Total/NA	Water	SM 4500 S2 D	
LCS 480-185455/42	Lab Control Sample	Total/NA	Water	SM 4500 S2 D	
MB 480-185455/41	Method Blank	Total/NA	Water	SM 4500 S2 D	

Analysis Batch: 185494

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60857-1	MW-7-053014	Total/NA	Water	350.1	
480-60857-1 DU	MW-7-053014	Total/NA	Water	350.1	
480-60857-1 MS	MW-7-053014	Total/NA	Water	350.1	
LCS 480-185494/28	Lab Control Sample	Total/NA	Water	350.1	
MB 480-185494/27	Method Blank	Total/NA	Water	350.1	

Analysis Batch: 185887

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60857-1	MW-7-053014	Total/NA	Water	300.0	
LCS 480-185887/3	Lab Control Sample	Total/NA	Water	300.0	
MB 480-185887/4	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 186052

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60857-1	MW-7-053014	Total/NA	Water	9060A	
480-60857-1 DU	MW-7-053014	Total/NA	Water	9060A	
LCS 480-186052/29	Lab Control Sample	Total/NA	Water	9060A	
LCS 480-186052/4	Lab Control Sample	Total/NA	Water	9060A	
MB 480-186052/28	Method Blank	Total/NA	Water	9060A	
MB 480-186052/3	Method Blank	Total/NA	Water	9060A	

Lab Chronicle

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60857-1

Client Sample ID: MW-7-053014
Date Collected: 05/30/14 12:40
Date Received: 05/30/14 14:10

Lab Sample ID: 480-60857-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		20000	186995	06/11/14 13:30	GTG	TAL BUF
Total/NA	Analysis	RSK-175		1	73077	06/04/14 15:21	NEA	TAL BUR
Total/NA	Analysis	RSK-175		5	185084	06/02/14 13:18	MAN	TAL BUF
Total/NA	Prep	3005A			185098	06/03/14 09:05	EHD	TAL BUF
Total/NA	Analysis	6010C		1	185827	06/04/14 16:45	JRK	TAL BUF
Total/NA	Analysis	300.0		5	185423	06/03/14 23:23	KRC	TAL BUF
Total/NA	Analysis	300.0		5	185887	06/05/14 17:37	KRC	TAL BUF
Total/NA	Analysis	350.1		1	185494	06/03/14 18:19	RS	TAL BUF
Total/NA	Analysis	353.2		1	184999	05/30/14 18:23	KS	TAL BUF
Total/NA	Analysis	353.2		1	185000	05/30/14 18:23	KS	TAL BUF
Total/NA	Analysis	9060A		1	186052	06/05/14 13:24	KRC	TAL BUF
Total/NA	Analysis	SM 2320B		1	185231	06/02/14 11:10	VAJ	TAL BUF
Total/NA	Analysis	SM 4500 S2 D		1	185455	06/03/14 13:49	KJ1	TAL BUF

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL BUR = TestAmerica Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Certification Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60857-1

Laboratory: TestAmerica Buffalo

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0686	07-06-14
California	State Program	9	1169CA	09-30-14
Connecticut	State Program	1	PH-0568	09-30-14
Florida	NELAP	4	E87672	06-30-14 *
Georgia	State Program	4	N/A	03-31-15
Illinois	NELAP	5	200003	09-30-14
Iowa	State Program	7	374	03-01-15
Kansas	NELAP	7	E-10187	01-31-15
Kentucky (DW)	State Program	4	90029	12-31-14
Kentucky (UST)	State Program	4	30	03-31-15
Louisiana	NELAP	6	02031	06-30-14 *
Maine	State Program	1	NY00044	12-04-14
Maryland	State Program	3	294	03-31-15
Massachusetts	State Program	1	M-NY044	06-30-14 *
Michigan	State Program	5	9937	03-31-15
Minnesota	NELAP	5	036-999-337	12-31-14
New Hampshire	NELAP	1	2337	11-17-14
New Jersey	NELAP	2	NY455	06-30-14
New York	NELAP	2	10026	03-31-15
North Dakota	State Program	8	R-176	03-31-14 *
Oklahoma	State Program	6	9421	08-31-14
Oregon	NELAP	10	NY200003	06-09-15
Pennsylvania	NELAP	3	68-00281	07-31-14
Rhode Island	State Program	1	LAO00328	12-30-14
Tennessee	State Program	4	TN02970	03-31-15
Texas	NELAP	6	T104704412-11-2	07-31-14
USDA	Federal		P330-11-00386	11-22-14
Virginia	NELAP	3	460185	09-14-14
Washington	State Program	10	C784	02-10-15
Wisconsin	State Program	5	998310390	08-31-14

Laboratory: TestAmerica Burlington

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Connecticut	State Program	1	PH-0751	09-30-15
DE Haz. Subst. Cleanup Act (HSCA)	State Program	3	NA	02-13-15
Florida	NELAP	4	E87467	06-30-14 *
L-A-B	DoD ELAP		L2336	02-26-17
Louisiana	NELAP	6	176292	06-30-14
Maine	State Program	1	VT00008	04-17-15
Minnesota	NELAP	5	050-999-436	12-31-14
New Hampshire	NELAP	1	2006	12-18-14
New Jersey	NELAP	2	VT972	06-30-14 *
New York	NELAP	2	10391	03-31-15
Pennsylvania	NELAP	3	68-00489	04-30-15
Rhode Island	State Program	1	LAO00298	12-30-14
US Fish & Wildlife	Federal		LE-058448-0	02-28-15
USDA	Federal		P330-11-00093	10-28-16
Vermont	State Program	1	VT-4000	12-31-14

* Certification renewal pending - certification considered valid.

Certification Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60857-1

Laboratory: TestAmerica Burlington (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Virginia	NELAP	3	460209	12-14-14

Method Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60857-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	TAL BUF
RSK-175	Dissolved Gases (GC)	RSK	TAL BUR
RSK-175	Dissolved Gases (GC)	RSK	TAL BUF
6010C	Metals (ICP)	SW846	TAL BUF
300.0	Anions, Ion Chromatography	MCAWW	TAL BUF
350.1	Nitrogen, Ammonia	MCAWW	TAL BUF
353.2	Nitrate	EPA	TAL BUF
353.2	Nitrogen, Nitrite	MCAWW	TAL BUF
9060A	Organic Carbon, Total (TOC)	SW846	TAL BUF
SM 2320B	Alkalinity	SM	TAL BUF
SM 4500 S2 D	Sulfide, Total	SM	TAL BUF

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL BUR = TestAmerica Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Sample Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60857-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-60857-1	MW-7-053014	Water	05/30/14 12:40	05/30/14 14:10

TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: T. Bohlen	Lab PM: Deyo, Melissa L	Carrier Tracking No(s):	COC No: 480-49375-13138.4
Client Contact: Mr. Tom Bohlen	Phone: 716-685-2300	E-Mail: melissa.deyo@testamericainc.com		Page: Page 4 of 4
Company: GZA GeoEnvironmental, Inc.				Job #:
Address: 535 Washington Street 11th Floor	Due Date Requested:			
City: Buffalo	TAT Requested (days):			
State, Zip: NY, 14203				
Phone:	PO #: 4062165			
Email: thomas.bohlen@gza.com	WO #: 58507			
Project Name: 058507, GM-Lockport Groundwater Sampling	Project #: 48004014			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	RSK_175_CO2 - Carbon dioxide	350.1 - Ammonia	6010B - Metals - Fe, Mn, Mg	8260B - PCE, TCE, DCE (trans and cis), Vinyl Chl	9060 - Total Organic Carbon	RSK_175 - Methane, Ethane, Ethene	SM4500_S2_D - Sulfide	353.2, 353.2_Nitrite, Nitrate_Calc	2320B - Total Alkalinity	300.0_28D - Anions (Chloride & Sulfate)			Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	S	D	A	A	A	CB	N	N	N				
MW-7-053014	5/30/14	1340	G	Water	U	N	X	X	X	X	X	X	X	X	X	X				
				Water																
				Water																
				Water																
				Water																
				Water																

480-60857 Chain of Custody

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological	☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Thomas Bohlen	5/30/14 1410	GZA		5/30/14 1410	TA Buff.
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: #2 3.6

6/13/2014

Login Sample Receipt Checklist

Client: Conestoga-Rovers & Associates, Inc.

Job Number: 480-60857-1

Login Number: 60857

List Source: TestAmerica Buffalo

List Number: 1

Creator: Kolb, Chris M

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	gza
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	

Login Sample Receipt Checklist

Client: Conestoga-Rovers & Associates, Inc.

Job Number: 480-60857-1

Login Number: 60857
List Number: 2
Creator: Gagne, Eric M

List Source: TestAmerica Burlington
List Creation: 06/03/14 11:35 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	877571
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	4.4ºC. IR GUN ID 181. CF = 0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	No sample times listed on container labels.
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

TestAmerica Job ID: 480-59766-1

Client Project/Site: 058507, GM-Lockport Groundwater Sampling

For:

Conestoga-Rovers & Associates, Inc.
2055 Niagara Falls Blvd., Suite 3
Niagara Falls, New York 14304

Attn: Kathleen Willy

Authorized for release by:
5/29/2014 4:00:07 PM
Rebecca Jones, Project Management Assistant I
rebecca.jones@testamericainc.com

Designee for

Melissa Deyo, Project Manager I
(716)504-9874
melissa.deyo@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Cover Page 1
Table of Contents 2
Definitions/Glossary 3
Case Narrative 4
Detection Summary 5
Client Sample Results 6
Surrogate Summary 7
QC Sample Results 8
QC Association Summary 13
Lab Chronicle 15
Certification Summary 16
Method Summary 18
Sample Summary 19
Subcontract Data 20
Chain of Custody 28
Receipt Checklists 29

Qualifiers

GC VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 480-59766-1

Laboratory: TestAmerica Buffalo

Narrative

Job Narrative
480-59766-1

Receipt
The sample was received on 5/13/2014 6:35 PM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 5.2º C.

Except:

Method(s) VFA-IC: The preprinted Chain-of-Custody (COC) was incomplete. It is missing the Volatile Fatty Acid anlaysis.

GC/MS VOA
Method(s) 8260C: The following sample(s) was diluted to bring the concentration of target analytes within the calibration range: (480-59766-1 MS), (480-59766-1 MSD), MW-4-051314 (480-59766-1). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

IC
Method(s) 300.0: The following sample(s) was diluted to bring the concentration of target analytes within the calibration range: MW-4-051314 (480-59766-1). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC VOA
Method(s) RSK-175: The following sample was diluted to bring the concentration of target analytes within the calibration range: MW-4-051314 (480-59766-1). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-59766-1

Client Sample ID: MW-4-051314

Lab Sample ID: 480-59766-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	22000		500	410	ug/L	500		8260C	Total/NA
Trichloroethene	22000		500	230	ug/L	500		8260C	Total/NA
Vinyl chloride	2900		500	450	ug/L	500		8260C	Total/NA
Hydrogen	0.52		0.60		nm	1		AM20GAX	Total/NA
Ethane	75		7.5	1.5	ug/L	1		RSK-175	Total/NA
Ethene - DL	310	J	350	75	ug/L	50		RSK-175	Total/NA
Methane - DL	1200		200	50	ug/L	50		RSK-175	Total/NA
Iron	0.81		0.050	0.019	mg/L	1		6010C	Total/NA
Magnesium	63.8		0.20	0.043	mg/L	1		6010C	Total/NA
Manganese	0.47		0.0030	0.00040	mg/L	1		6010C	Total/NA
Chloride	1750		25.0	14.1	mg/L	50		300.0	Total/NA
Sulfate	223		100	17.5	mg/L	50		300.0	Total/NA
Ammonia	1.7		0.020	0.0090	mg/L	1		350.1	Total/NA
Nitrate	0.079		0.050	0.020	mg/L	1		353.2	Total/NA
Total Organic Carbon	2.9		1.0	0.43	mg/L	1		9060A	Total/NA
Total Alkalinity	299		5.0	0.79	mg/L	1		SM 2320B	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Carbon dioxide	14000		1000	1000	ug/L	1		RSK-175	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-59766-1

Client Sample ID: MW-4-051314
Date Collected: 05/13/14 17:00
Date Received: 05/13/14 18:35

Lab Sample ID: 480-59766-1
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	22000		500	410	ug/L			05/17/14 08:06	500
Tetrachloroethene	ND		500	180	ug/L			05/17/14 08:06	500
trans-1,2-Dichloroethene	ND		500	450	ug/L			05/17/14 08:06	500
Trichloroethene	22000		500	230	ug/L			05/17/14 08:06	500
Vinyl chloride	2900		500	450	ug/L			05/17/14 08:06	500

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*66 - 137*		*05/17/14 08:06*	*500*
4-Bromofluorobenzene (Surr)	*95*		*73 - 120*		*05/17/14 08:06*	*500*
Toluene-d8 (Surr)	*97*		*71 - 126*		*05/17/14 08:06*	*500*
Dibromofluoromethane (Surr)	*101*		*60 - 140*		*05/17/14 08:06*	*500*

Method: AM20GAX - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hydrogen	0.52		0.60		nm			05/16/14 16:59	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	75		7.5	1.5	ug/L			05/14/14 10:05	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon dioxide	14000		1000	1000	ug/L			05/19/14 11:14	1

Method: RSK-175 - Dissolved Gases (GC) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethene	310	J	350	75	ug/L			05/14/14 13:35	50
Methane	1200		200	50	ug/L			05/14/14 13:35	50

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	0.81		0.050	0.019	mg/L		05/14/14 09:10	05/14/14 22:07	1
Magnesium	63.8		0.20	0.043	mg/L		05/14/14 09:10	05/14/14 22:07	1
Manganese	0.47		0.0030	0.00040	mg/L		05/14/14 09:10	05/14/14 22:07	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1750		25.0	14.1	mg/L			05/16/14 17:42	50
Sulfate	223		100	17.5	mg/L			05/16/14 17:42	50
Ammonia	1.7		0.020	0.0090	mg/L			05/15/14 15:07	1
Nitrate	0.079		0.050	0.020	mg/L			05/14/14 11:51	1
Nitrite	ND		0.050	0.020	mg/L			05/14/14 11:51	1
Total Organic Carbon	2.9		1.0	0.43	mg/L			05/22/14 15:42	1
Total Alkalinity	299		5.0	0.79	mg/L			05/14/14 10:43	1
Sulfide	ND		0.10	0.052	mg/L			05/14/14 12:12	1

Surrogate Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-59766-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		12DCE	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(66-137)	(73-120)	(71-126)	(60-140)
480-59766-1	MW-4-051314	104	95	97	101
480-59766-1 MS	MW-4-051314	102	97	96	100
480-59766-1 MSD	MW-4-051314	102	98	97	100
LCS 480-182645/5	Lab Control Sample	97	98	98	95
MB 480-182645/11	Method Blank	100	96	95	96

Surrogate Legend

12DCE = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 480-182645/11
Matrix: Water
Analysis Batch: 182645

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			05/17/14 01:11	1
Tetrachloroethene	ND		1.0	0.36	ug/L			05/17/14 01:11	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			05/17/14 01:11	1
Trichloroethene	ND		1.0	0.46	ug/L			05/17/14 01:11	1
Vinyl chloride	ND		1.0	0.90	ug/L			05/17/14 01:11	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*66 - 137*		*05/17/14 01:11*	*1*
4-Bromofluorobenzene (Surr)	*96*		*73 - 120*		*05/17/14 01:11*	*1*
Toluene-d8 (Surr)	*95*		*71 - 126*		*05/17/14 01:11*	*1*
Dibromofluoromethane (Surr)	*96*		*60 - 140*		*05/17/14 01:11*	*1*

Lab Sample ID: LCS 480-182645/5
Matrix: Water
Analysis Batch: 182645

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,2-Dichloroethene	25.0	22.8		ug/L		91	74 - 124
Tetrachloroethene	25.0	22.8		ug/L		91	74 - 122
trans-1,2-Dichloroethene	25.0	22.1		ug/L		88	73 - 127
Trichloroethene	25.0	22.5		ug/L		90	74 - 123

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*66 - 137*
4-Bromofluorobenzene (Surr)	*98*		*73 - 120*
Toluene-d8 (Surr)	*98*		*71 - 126*
Dibromofluoromethane (Surr)	*95*		*60 - 140*

Lab Sample ID: 480-59766-1 MS
Matrix: Water
Analysis Batch: 182645

Client Sample ID: MW-4-051314
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,2-Dichloroethene	22000		12500	33400		ug/L		88	74 - 124
Tetrachloroethene	ND		12500	11400		ug/L		91	74 - 122
trans-1,2-Dichloroethene	ND		12500	11500		ug/L		92	73 - 127
Trichloroethene	22000		12500	33100		ug/L		86	74 - 123

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*66 - 137*
4-Bromofluorobenzene (Surr)	*97*		*73 - 120*
Toluene-d8 (Surr)	*96*		*71 - 126*
Dibromofluoromethane (Surr)	*100*		*60 - 140*

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: 480-59766-1 MSD
Matrix: Water
Analysis Batch: 182645

Client Sample ID: MW-4-051314
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
cis-1,2-Dichloroethene	22000		12500	32300		ug/L		79	74 - 124	3	15
Tetrachloroethene	ND		12500	10800		ug/L		86	74 - 122	6	20
trans-1,2-Dichloroethene	ND		12500	10900		ug/L		87	73 - 127	5	20
Trichloroethene	22000		12500	31900		ug/L		76	74 - 123	4	16

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*66 - 137*
4-Bromofluorobenzene (Surr)	*98*		*73 - 120*
Toluene-d8 (Surr)	*97*		*71 - 126*
Dibromofluoromethane (Surr)	*100*		*60 - 140*

Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 480-181889/3
Matrix: Water
Analysis Batch: 181889

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	ND		7.5	1.5	ug/L			05/14/14 09:01	1
Ethene	ND		7.0	1.5	ug/L			05/14/14 09:01	1
Methane	ND		4.0	1.0	ug/L			05/14/14 09:01	1

Lab Sample ID: LCS 480-181889/4
Matrix: Water
Analysis Batch: 181889

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ethane	14.6	17.0		ug/L		117	52 - 138
Ethene	13.5	15.8		ug/L		117	50 - 137
Methane	7.69	8.76		ug/L		114	48 - 174

Lab Sample ID: LCSD 480-181889/5
Matrix: Water
Analysis Batch: 181889

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ethane	14.6	15.7		ug/L		107	52 - 138	8	50
Ethene	13.5	14.0		ug/L		104	50 - 137	12	50
Methane	7.69	8.02		ug/L		104	48 - 174	9	50

Lab Sample ID: MB 200-72287/3
Matrix: Water
Analysis Batch: 72287

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon dioxide	ND		1000	1000	ug/L			05/19/14 10:26	1

Method: RSK-175 - Dissolved Gases (GC) (Continued)

Lab Sample ID: LCS 200-72287/2
Matrix: Water
Analysis Batch: 72287

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Carbon dioxide	5010	4720		ug/L		94	70 - 130

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 480-181866/1-A
Matrix: Water
Analysis Batch: 182207

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 181866

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.050	0.019	mg/L		05/14/14 09:10	05/14/14 20:50	1
Magnesium	ND		0.20	0.043	mg/L		05/14/14 09:10	05/14/14 20:50	1
Manganese	ND		0.0030	0.00040	mg/L		05/14/14 09:10	05/14/14 20:50	1

Lab Sample ID: LCS 480-181866/2-A
Matrix: Water
Analysis Batch: 182207

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 181866

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	10.0	9.91		mg/L		99	80 - 120
Magnesium	10.0	9.76		mg/L		98	80 - 120
Manganese	0.200	0.195		mg/L		98	80 - 120

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 480-182550/4
Matrix: Water
Analysis Batch: 182550

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			05/16/14 15:20	1
Sulfate	ND		2.0	0.35	mg/L			05/16/14 15:20	1

Lab Sample ID: LCS 480-182550/3
Matrix: Water
Analysis Batch: 182550

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	19.35		mg/L		97	90 - 110
Sulfate	20.0	19.71		mg/L		99	90 - 110

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 480-182360/123
Matrix: Water
Analysis Batch: 182360

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.020	0.0090	mg/L			05/15/14 13:14	1

Method: 350.1 - Nitrogen, Ammonia (Continued)

Lab Sample ID: MB 480-182360/195
Matrix: Water
Analysis Batch: 182360

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.020	0.0090	mg/L			05/15/14 14:25	1

Lab Sample ID: MB 480-182360/219
Matrix: Water
Analysis Batch: 182360

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.020	0.0090	mg/L			05/15/14 14:49	1

Lab Sample ID: LCS 480-182360/124
Matrix: Water
Analysis Batch: 182360

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	1.02		mg/L		102	90 - 110

Lab Sample ID: LCS 480-182360/196
Matrix: Water
Analysis Batch: 182360

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	1.00		mg/L		100	90 - 110

Lab Sample ID: LCS 480-182360/220
Matrix: Water
Analysis Batch: 182360

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	1.01		mg/L		101	90 - 110

Method: 353.2 - Nitrogen, Nitrite

Lab Sample ID: MB 480-181993/3
Matrix: Water
Analysis Batch: 181993

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrite	ND		0.050	0.020	mg/L			05/14/14 11:46	1

Lab Sample ID: LCS 480-181993/4
Matrix: Water
Analysis Batch: 181993

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrite	1.50	1.54		mg/L		103	90 - 110

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-59766-1

Method: 9060A - Organic Carbon, Total (TOC)

Lab Sample ID: MB 480-183720/38
Matrix: Water
Analysis Batch: 183720

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		1.0	0.43	mg/L			05/22/14 14:47	1

Lab Sample ID: LCS 480-183720/39
Matrix: Water
Analysis Batch: 183720

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	60.0	56.50		mg/L		94	90 - 110

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 480-182020/6
Matrix: Water
Analysis Batch: 182020

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity	ND		5.0	0.79	mg/L			05/14/14 10:19	1

Lab Sample ID: LCS 480-182020/7
Matrix: Water
Analysis Batch: 182020

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Alkalinity	100	94.43		mg/L		94	90 - 110

Method: SM 4500 S2 D - Sulfide, Total

Lab Sample ID: MB 480-182028/3
Matrix: Water
Analysis Batch: 182028

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		0.10	0.052	mg/L			05/14/14 11:48	1

Lab Sample ID: LCS 480-182028/4
Matrix: Water
Analysis Batch: 182028

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfide	0.750	0.691		mg/L		92	90 - 110

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-59766-1

GC/MS VOA

Analysis Batch: 182645

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-59766-1	MW-4-051314	Total/NA	Water	8260C	
480-59766-1 MS	MW-4-051314	Total/NA	Water	8260C	
480-59766-1 MSD	MW-4-051314	Total/NA	Water	8260C	
LCS 480-182645/5	Lab Control Sample	Total/NA	Water	8260C	
MB 480-182645/11	Method Blank	Total/NA	Water	8260C	

GC VOA

Analysis Batch: 72287

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-59766-1	MW-4-051314	Total/NA	Water	RSK-175	
LCS 200-72287/2	Lab Control Sample	Total/NA	Water	RSK-175	
MB 200-72287/3	Method Blank	Total/NA	Water	RSK-175	

Analysis Batch: 181889

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-59766-1	MW-4-051314	Total/NA	Water	RSK-175	
480-59766-1 - DL	MW-4-051314	Total/NA	Water	RSK-175	
LCS 480-181889/4	Lab Control Sample	Total/NA	Water	RSK-175	
LCSD 480-181889/5	Lab Control Sample Dup	Total/NA	Water	RSK-175	
MB 480-181889/3	Method Blank	Total/NA	Water	RSK-175	

Analysis Batch: 184674

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-59766-1	MW-4-051314	Total/NA	Water	AM20GAX	

Metals

Prep Batch: 181866

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-59766-1	MW-4-051314	Total/NA	Water	3005A	
LCS 480-181866/2-A	Lab Control Sample	Total/NA	Water	3005A	
MB 480-181866/1-A	Method Blank	Total/NA	Water	3005A	

Analysis Batch: 182207

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-59766-1	MW-4-051314	Total/NA	Water	6010C	181866
LCS 480-181866/2-A	Lab Control Sample	Total/NA	Water	6010C	181866
MB 480-181866/1-A	Method Blank	Total/NA	Water	6010C	181866

General Chemistry

Analysis Batch: 181993

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-59766-1	MW-4-051314	Total/NA	Water	353.2	
LCS 480-181993/4	Lab Control Sample	Total/NA	Water	353.2	
MB 480-181993/3	Method Blank	Total/NA	Water	353.2	

General Chemistry (Continued)

Analysis Batch: 182019

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-59766-1	MW-4-051314	Total/NA	Water	353.2	

Analysis Batch: 182020

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-59766-1	MW-4-051314	Total/NA	Water	SM 2320B	
LCS 480-182020/7	Lab Control Sample	Total/NA	Water	SM 2320B	
MB 480-182020/6	Method Blank	Total/NA	Water	SM 2320B	

Analysis Batch: 182028

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-59766-1	MW-4-051314	Total/NA	Water	SM 4500 S2 D	
LCS 480-182028/4	Lab Control Sample	Total/NA	Water	SM 4500 S2 D	
MB 480-182028/3	Method Blank	Total/NA	Water	SM 4500 S2 D	

Analysis Batch: 182360

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-59766-1	MW-4-051314	Total/NA	Water	350.1	
LCS 480-182360/124	Lab Control Sample	Total/NA	Water	350.1	
LCS 480-182360/196	Lab Control Sample	Total/NA	Water	350.1	
LCS 480-182360/220	Lab Control Sample	Total/NA	Water	350.1	
MB 480-182360/123	Method Blank	Total/NA	Water	350.1	
MB 480-182360/195	Method Blank	Total/NA	Water	350.1	
MB 480-182360/219	Method Blank	Total/NA	Water	350.1	

Analysis Batch: 182550

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-59766-1	MW-4-051314	Total/NA	Water	300.0	
LCS 480-182550/3	Lab Control Sample	Total/NA	Water	300.0	
MB 480-182550/4	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 183720

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-59766-1	MW-4-051314	Total/NA	Water	9060A	
LCS 480-183720/39	Lab Control Sample	Total/NA	Water	9060A	
MB 480-183720/38	Method Blank	Total/NA	Water	9060A	

Lab Chronicle

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-59766-1

Client Sample ID: MW-4-051314
Date Collected: 05/13/14 17:00
Date Received: 05/13/14 18:35

Lab Sample ID: 480-59766-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		500	182645	05/17/14 08:06	GTG	TAL BUF
Total/NA	Analysis	AM20GAX		1	184674	05/16/14 16:59	CTB	SC0015
Total/NA	Analysis	RSK-175		1	72287	05/19/14 11:14	NEA	TAL BUR
Total/NA	Analysis	RSK-175		1	181889	05/14/14 10:05	MAN	TAL BUF
Total/NA	Analysis	RSK-175	DL	50	181889	05/14/14 13:35	MAN	TAL BUF
Total/NA	Prep	3005A			181866	05/14/14 09:10	EHD	TAL BUF
Total/NA	Analysis	6010C		1	182207	05/14/14 22:07		TAL BUF
Total/NA	Analysis	300.0		50	182550	05/16/14 17:42	KRC	TAL BUF
Total/NA	Analysis	350.1		1	182360	05/15/14 15:07	KMF	TAL BUF
Total/NA	Analysis	353.2		1	182019	05/14/14 11:51	KMF	TAL BUF
Total/NA	Analysis	353.2		1	181993	05/14/14 11:51	KMF	TAL BUF
Total/NA	Analysis	9060A		1	183720	05/22/14 15:42	KRC	TAL BUF
Total/NA	Analysis	SM 2320B		1	182020	05/14/14 10:43	VAJ	TAL BUF
Total/NA	Analysis	SM 4500 S2 D		1	182028	05/14/14 12:12	KJ1	TAL BUF

Laboratory References:

SC0015 = Pittsburgh, PA (formerly Microseeps), 220 William Pitt Way, Pittsburgh, PA 15238, TEL (412)826-5245

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL BUR = TestAmerica Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Certification Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-59766-1

Laboratory: TestAmerica Buffalo

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0686	07-06-14
California	State Program	9	1169CA	09-30-14
Connecticut	State Program	1	PH-0568	09-30-14
Florida	NELAP	4	E87672	06-30-14
Georgia	State Program	4	N/A	03-31-15
Illinois	NELAP	5	200003	09-30-14
Iowa	State Program	7	374	03-01-15
Kansas	NELAP	7	E-10187	01-31-15
Kentucky (DW)	State Program	4	90029	12-31-14
Kentucky (UST)	State Program	4	30	03-31-15
Louisiana	NELAP	6	02031	06-30-14
Maine	State Program	1	NY00044	12-04-14
Maryland	State Program	3	294	03-31-15
Massachusetts	State Program	1	M-NY044	06-30-14
Michigan	State Program	5	9937	03-31-15
Minnesota	NELAP	5	036-999-337	12-31-14
New Hampshire	NELAP	1	2337	11-17-14
New Jersey	NELAP	2	NY455	06-30-14
New York	NELAP	2	10026	03-31-15
North Dakota	State Program	8	R-176	03-31-14 *
Oklahoma	State Program	6	9421	08-31-14
Oregon	NELAP	10	NY200003	06-09-14
Pennsylvania	NELAP	3	68-00281	07-31-14
Rhode Island	State Program	1	LAO00328	12-30-14
Tennessee	State Program	4	TN02970	03-31-15
Texas	NELAP	6	T104704412-11-2	07-31-14
USDA	Federal		P330-11-00386	11-22-14
Virginia	NELAP	3	460185	09-14-14
Washington	State Program	10	C784	02-10-15
West Virginia DEP	State Program	3	252	05-31-14
Wisconsin	State Program	5	998310390	08-31-14

Laboratory: TestAmerica Burlington

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Connecticut	State Program	1	PH-0751	09-30-15
DE Haz. Subst. Cleanup Act (HSCA)	State Program	3	NA	02-13-15
Florida	NELAP	4	E87467	06-30-14 *
L-A-B	DoD ELAP		L2336	02-26-17
Louisiana	NELAP	6	176292	06-30-14
Maine	State Program	1	VT00008	04-17-15
Minnesota	NELAP	5	050-999-436	12-31-14
New Hampshire	NELAP	1	2006	12-18-14
New Jersey	NELAP	2	VT972	06-30-14 *
New York	NELAP	2	10391	03-31-15
Pennsylvania	NELAP	3	68-00489	04-30-15
Rhode Island	State Program	1	LAO00298	12-30-14
US Fish & Wildlife	Federal		LE-058448-0	02-28-15
USDA	Federal		P330-11-00093	10-28-16

* Expired certification is currently pending renewal and is considered valid.

Certification Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-59766-1

Laboratory: TestAmerica Burlington (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Vermont	State Program	1	VT-4000	12-31-14
Virginia	NELAP	3	460209	12-14-14

Method Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-59766-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	TAL BUF
AM20GAX	Dissolved Gases (GC)	NONE	SC0015
RSK-175	Dissolved Gases (GC)	RSK	TAL BUR
RSK-175	Dissolved Gases (GC)	RSK	TAL BUF
6010C	Metals (ICP)	SW846	TAL BUF
300.0	Anions, Ion Chromatography	MCAWW	TAL BUF
350.1	Nitrogen, Ammonia	MCAWW	TAL BUF
353.2	Nitrogen, Nitrite	MCAWW	TAL BUF
353.2	Nitrate	EPA	TAL BUF
9060A	Organic Carbon, Total (TOC)	SW846	TAL BUF
SM 2320B	Alkalinity	SM	TAL BUF
SM 4500 S2 D	Sulfide, Total	SM	TAL BUF

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

NONE = NONE

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

SC0015 = Pittsburgh, PA (formerly Microseeps), 220 William Pitt Way, Pittsburgh, PA 15238, TEL (412)826-5245

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL BUR = TestAmerica Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Sample Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-59766-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-59766-1	MW-4-051314	Water	05/13/14 17:00	05/13/14 18:35

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

May 20, 2014

Melissa Deyo
Test America
10 Hazelwood Drive
Buffalo, NY 14228

RE: **GM LOCKPORT / 480-59766-1**

Microseeps Workorder: 12172

Dear Melissa Deyo:

Enclosed are the analytical results for sample(s) received by the laboratory on Thursday, May 15, 2014. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Robbin Robl 05/20/2014
rrobl@microseeps.com

Customer Service Representative

Enclosures

As a valued client we would appreciate your comments on our service.
Please email info@microseeps.com.

Total Number of Pages 4

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

LABORATORY ACCREDITATIONS & CERTIFICATIONS

Accreditor:	Pennsylvania Department of Environmental Protection, Bureau of Laboratories
Accreditation ID:	02-00538
Scope:	NELAP Non-Potable Water and Solid & Hazardous Waste
Accreditor:	NELAP: State of Florida, Department of Health, Bureau of Laboratories
Accreditation ID:	E87832
Scope:	Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)
Accreditor:	South Carolina Department of Health and Environmental Control, Office of Environmental Laboratory Certification
Accreditation ID:	89009003
Scope:	Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA)
Accreditor:	NELAP: State of Louisiana, Department of Environmental Quality
Accreditation ID:	04104
Scope:	Solid and Chemical Materials; Non-Potable Water
Accreditor:	NELAP: New Jersey, Department of Environmental Protection
Accreditation ID:	PA026
Scope:	Non-Potable Water; Solid and Chemical Materials
Accreditor:	NELAP: New York, Department of Health Wadsworth Center
Accreditation ID:	11815
Scope:	Non-Potable Water; Solid and Hazardous Waste
Accreditor:	State of Connecticut, Department of Public Health, Division of Environmental Health
Accreditation ID:	PH-0263
Scope:	Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)
Accreditor:	NELAP: Texas, Commission on Environmental Quality
Accreditation ID:	T104704453-09-TX
Scope:	Non-Potable Water
Accreditor:	State of New Hampshire
Accreditation ID:	299409
Scope:	Non-potable water
Accreditor:	State of Georgia
Accreditation ID:	Chapter 391-3-26
Scope:	As per the Georgia EPD Rules and Regulations for Commercial Laboratories, Microseeps is accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

SAMPLE SUMMARY

Workorder: 12172 GM LOCKPORT / 480-59766-1

Lab ID	Sample ID	Matrix	Date Collected	Date Received
121720001	MW-4-051314(480-59766-1)	Bubble Strip	5/13/2014 17:00	5/15/2014 11:00

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 12172 GM LOCKPORT / 480-59766-1

Lab ID: **121720001** Date Received: 5/15/2014 11:00 Matrix: Bubble Strip

Sample ID: **MW-4-051314(480-59766-1)** Date Collected: 5/13/2014 17:00

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
RISK - MICR										
Analysis Desc: AM20GAX			Analytical Method: AM20GAX							
Hydrogen	**0.52J**	nM	0.60	0.049	1			5/16/2014 16:59	SL	

CERTIFICATE OF ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS QUALIFIERS

Workorder: 12172 GM LOCKPORT / 480-59766-1

DEFINITIONS/QUALIFIERS

Disclaimer :	The Pennsylvania Department of Environmental Protection (PADEP) has decided to no longer recognize analyses that do not produce data for primary compliance, for NELAP accreditation. The methods affected by this decision are AM20GAx, AM21G, SW846 7199 and AM4.02. The laboratory shall continue to administer the NELAP/TNI standard requirements in the performance of these methods.
MDL	Method Detection Limit. Can be used synonymously with LOD; Limit Of Detection.
PQL	Practical Quanitation Limit. Can be used synonymously with LOQ; Limit Of Quantitation.
ND	Not detected at or above reporting limit.
DF	Dilution Factor.
S	Surrogate.
RPD	Relative Percent Difference.
% Rec	Percent Recovery.
U	Indicates the compound was analyzed for, but not detected at or above the noted concentration.
J	Estimated concentration greater than the set method detection limit (MDL) and less than the set reporting limit (PQL).

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

QUALITY CONTROL DATA

Workorder: 12172 GM LOCKPORT / 480-59766-1

QC Batch: DISG/3780 Analysis Method: AM20GAX

QC Batch Method: AM20GAX

Associated Lab Samples: 121720001

METHOD BLANK: 27798

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Hydrogen	nM	0.60 U	0.60	

LABORATORY CONTROL SAMPLE & LCSD: 27799 27800

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
RISK										
Hydrogen	nM	24	25	25	102	102	80-120	0	20	

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 12172 GM LOCKPORT / 480-59766-1

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
121720001	MW-4-051314(480-59766-1)			AM20GAX	DISG/3780

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

12172

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Deyo, Melissa L	Carrier Tracking No(s):	COC No: 480-16361.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: melissa.deyo@testamericainc.com		Page: Page 1 of 1
Company: Pace Analytical Services, Inc.		Analysis Requested		Job #: 480-59766-1
Address: 220 William Pitt Way,	Due Date Requested: 5/23/2014			Preservation Codes:
City: Pittsburgh	TAT Requested (days):			A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
State, Zip: PA, 15238				
Phone: 412-826-5245(Tel)	PO #:			Other:
Email:	WO #:			
Project Name: 058507, GM-Lockport Groundwater Sampling	Project #: 48004014			
Site:	SSOW#:			

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	AM20GAX/ Hydrogen	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
MW-4-051314 (480-59766-1)	5/13/14	17:00 Eastern		Water			X	1	

Page 27 of 30

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	C. Kolb	05/14/14 1700	TA		5.15.14 1100	PAES
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

5/29/2014

TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: T. Bohlen	Lab PM: Deyo, Melissa L	Carrier Tracking No(s):	COC No: 480-49375-13138.4
Client Contact: Mr. Tom Bohlen	Phone: 716-685-2300	E-Mail: melissa.deyo@testamericainc.com		Page: Page 4 of 4
Company: GZA GeoEnvironmental, Inc.				Job #: 56546.00
Address: 535 Washington Street 11th Floor	Due Date Requested:			
City: Buffalo	TAT Requested (days):			
State, Zip: NY, 14203				
Phone:	PO #: 4062165			
Email: thomas.bohlen@gza.com	WO #: 58507			
Project Name: 058507, GM-Lockport Groundwater Sampling	Project #: 48004014			
Site:	SSOW#:			

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	RSK_175_CO2 - Carbon dioxide	350.1 - Ammonia	6010B - Metals - Fe, Mn, Mg	8260B - PCE, TCE, DCE (trans and cis), Vinyl Chl	9060 - Total Organic Carbon	RSK_175 - Methane, Ethane, Ethene	SM4500_S2_D - Sulfide	353.2, 353.2_Nitrite, Nitrate_Calc	2320B - Total Alkalinity	300.0_28D - Anions (Chloride & Sulfate)		AM30GAX	Total Number of containers	Special Instructions/Note:
			Preservation Code:		N	N	S	D	A	A	A	CB	N	N	N					
MW-4-051314	5/13/14	1700	G	Water	N	N	X	X	X	X	X	X	X	X	X			*		* Dissolved H2 for Microseeps
				Water																
				Water																
				Water																
				Water																
				Water																

480-59766 Chain of Custody

Possible Hazard Identification	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)***
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological	☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Thomas Bohlen	5/13/14/1835	GZA		5/13/14 1835	TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 5.2 #1

Page 28 of 30

5/29/2014

Login Sample Receipt Checklist

Client: Conestoga-Rovers & Associates, Inc.

Job Number: 480-59766-1

Login Number: 59766

List Source: TestAmerica Buffalo

List Number: 1

Creator: Kolb, Chris M

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	gza
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	

Login Sample Receipt Checklist

Client: Conestoga-Rovers & Associates, Inc.

Job Number: 480-59766-1

Login Number: 59766
List Number: 2
Creator: Marion, Greg T

List Source: TestAmerica Burlington
List Creation: 05/15/14 02:04 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	156582
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	4.2°c ir gun id 181/cf=0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	N/A	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

TestAmerica Job ID: 480-59866-1
Client Project/Site: 058507, GM-Lockport Groundwater Sampling

For:
Conestoga-Rovers & Associates, Inc.
2055 Niagara Falls Blvd., Suite 3
Niagara Falls, New York 14304

Attn: Kathleen Willy

Authorized for release by:
6/3/2014 5:26:32 PM
Rebecca Jones, Project Management Assistant I
rebecca.jones@testamericainc.com

Designee for

Melissa Deyo, Project Manager I
(716)504-9874
melissa.deyo@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Cover Page 1
Table of Contents 2
Definitions/Glossary 3
Case Narrative 4
Detection Summary 5
Client Sample Results 6
Surrogate Summary 7
QC Sample Results 8
QC Association Summary 13
Lab Chronicle 15
Certification Summary 16
Method Summary 18
Sample Summary 19
Subcontract Data 20
Chain of Custody 31
Receipt Checklists 32

Definitions/Glossary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-59866-1

Qualifiers

General Chemistry

Qualifier	Qualifier Description
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC exceeds the control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-59866-1

Job ID: 480-59866-1

Laboratory: TestAmerica Buffalo

Narrative

Job Narrative
480-59866-1

Receipt
The sample was received on 5/14/2014 6:03 PM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.6º C.

GC/MS VOA
Method(s) 8260C: The following sample(s) was diluted to bring the concentration of target analytes within the calibration range: MW-10-051414 (480-59866-1). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

IC
Method(s) 300.0: The following sample(s) was diluted to bring the concentration of target analytes within the calibration range: MW-10-051414 (480-59866-1). Elevated reporting limits (RLs) are provided.

Method(s) 300.0: The following sample(s) was diluted to bring the concentration of target analytes within the calibration range: (480-59866-1 MS), MW-10-051414 (480-59866-1). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC VOA
Method(s) RSK-175: The following samples were diluted to bring the concentration of target analytes within the calibration range: MW-10-051414 (480-59866-1). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
Method(s) 350.1: The continuing calibration blank (CCB) for batch 182370 contained ammonia above the reporting limit (RL). None of the samples associated with this method blank contained the target compound; therefore, re-extraction and/or re-analysis of samples were not performed.MW-10-051414 (480-59866-1)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-59866-1

Client Sample ID: MW-10-051414

Lab Sample ID: 480-59866-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	170		4.0	3.2	ug/L	4		8260C	Total/NA
Trichloroethene	48		4.0	1.8	ug/L	4		8260C	Total/NA
Vinyl chloride	29		4.0	3.6	ug/L	4		8260C	Total/NA
Hydrogen	0.95		0.60		nm	1		AM20GAX	Total/NA
Methane - DL	110		40	10	ug/L	10		RSK-175	Total/NA
Iron	0.070		0.050	0.019	mg/L	1		6010C	Total/NA
Magnesium	53.7		0.20	0.043	mg/L	1		6010C	Total/NA
Manganese	1.9		0.0030	0.00040	mg/L	1		6010C	Total/NA
Chloride	2580		25.0	14.1	mg/L	50		300.0	Total/NA
Sulfate	370		20.0	3.5	mg/L	10		300.0	Total/NA
Ammonia	0.010	J ^	0.020	0.0090	mg/L	1		350.1	Total/NA
Total Organic Carbon	3.5		1.0	0.43	mg/L	1		9060A	Total/NA
Total Alkalinity	272		5.0	0.79	mg/L	1		SM 2320B	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Carbon dioxide	15000		1000	1000	ug/L	1		RSK-175	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-59866-1

Client Sample ID: MW-10-051414
Date Collected: 05/14/14 10:15
Date Received: 05/14/14 18:03

Lab Sample ID: 480-59866-1
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	**170**		4.0	3.2	ug/L			05/19/14 14:48	4
Tetrachloroethene	ND		4.0	1.4	ug/L			05/19/14 14:48	4
trans-1,2-Dichloroethene	ND		4.0	3.6	ug/L			05/19/14 14:48	4
Trichloroethene	**48**		4.0	1.8	ug/L			05/19/14 14:48	4
Vinyl chloride	**29**		4.0	3.6	ug/L			05/19/14 14:48	4

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*66 - 137*		*05/19/14 14:48*	*4*
4-Bromofluorobenzene (Surr)	*100*		*73 - 120*		*05/19/14 14:48*	*4*
Toluene-d8 (Surr)	*96*		*71 - 126*		*05/19/14 14:48*	*4*
Dibromofluoromethane (Surr)	*95*		*60 - 140*		*05/19/14 14:48*	*4*

Method: AM20GAX - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hydrogen	**0.95**		0.60		nm			05/28/14 09:29	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	ND		7.5	1.5	ug/L			05/15/14 08:22	1
Ethene	ND		7.0	1.5	ug/L			05/15/14 08:22	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon dioxide	**15000**		1000	1000	ug/L			05/19/14 11:48	1

Method: RSK-175 - Dissolved Gases (GC) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	**110**		40	10	ug/L			05/15/14 09:30	10

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	**0.070**		0.050	0.019	mg/L		05/16/14 13:00	05/17/14 10:57	1
Magnesium	**53.7**		0.20	0.043	mg/L		05/16/14 13:00	05/17/14 10:57	1
Manganese	**1.9**		0.0030	0.00040	mg/L		05/16/14 13:00	05/17/14 10:57	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**2580**		25.0	14.1	mg/L			05/19/14 16:10	50
Sulfate	**370**		20.0	3.5	mg/L			05/16/14 15:16	10
Ammonia	**0.010**	**J ^**	0.020	0.0090	mg/L			05/15/14 19:34	1
Nitrate	ND		0.050	0.020	mg/L			05/14/14 22:34	1
Nitrite	ND		0.050	0.020	mg/L			05/14/14 22:34	1
Total Organic Carbon	**3.5**		1.0	0.43	mg/L			05/21/14 12:18	1
Total Alkalinity	**272**		5.0	0.79	mg/L			05/16/14 13:35	1
Sulfide	ND		0.10	0.052	mg/L			05/20/14 13:17	1

Surrogate Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-59866-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		12DCE	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(66-137)	(73-120)	(71-126)	(60-140)
480-59866-1	MW-10-051414	94	100	96	95
LCS 480-182774/5	Lab Control Sample	92	99	93	88
MB 480-182774/7	Method Blank	103	104	98	100

Surrogate Legend

12DCE = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 480-182774/7
Matrix: Water
Analysis Batch: 182774

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			05/19/14 11:34	1
Tetrachloroethene	ND		1.0	0.36	ug/L			05/19/14 11:34	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			05/19/14 11:34	1
Trichloroethene	ND		1.0	0.46	ug/L			05/19/14 11:34	1
Vinyl chloride	ND		1.0	0.90	ug/L			05/19/14 11:34	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*66 - 137*		*05/19/14 11:34*	*1*
4-Bromofluorobenzene (Surr)	*104*		*73 - 120*		*05/19/14 11:34*	*1*
Toluene-d8 (Surr)	*98*		*71 - 126*		*05/19/14 11:34*	*1*
Dibromofluoromethane (Surr)	*100*		*60 - 140*		*05/19/14 11:34*	*1*

Lab Sample ID: LCS 480-182774/5
Matrix: Water
Analysis Batch: 182774

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,2-Dichloroethene	25.0	21.9		ug/L		87	74 - 124
Tetrachloroethene	25.0	21.5		ug/L		86	74 - 122
trans-1,2-Dichloroethene	25.0	21.1		ug/L		84	73 - 127
Trichloroethene	25.0	21.2		ug/L		85	74 - 123

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*66 - 137*
4-Bromofluorobenzene (Surr)	*99*		*73 - 120*
Toluene-d8 (Surr)	*93*		*71 - 126*
Dibromofluoromethane (Surr)	*88*		*60 - 140*

Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 480-182161/3
Matrix: Water
Analysis Batch: 182161

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	ND		7.5	1.5	ug/L			05/15/14 07:02	1
Ethene	ND		7.0	1.5	ug/L			05/15/14 07:02	1
Methane	ND		4.0	1.0	ug/L			05/15/14 07:02	1

Lab Sample ID: LCS 480-182161/4
Matrix: Water
Analysis Batch: 182161

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ethane	14.6	13.0		ug/L		89	52 - 138
Ethene	13.5	11.8		ug/L		88	50 - 137
Methane	7.69	6.80		ug/L		88	48 - 174

Method: RSK-175 - Dissolved Gases (GC) (Continued)

Lab Sample ID: LCSD 480-182161/5
Matrix: Water
Analysis Batch: 182161

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ethane	14.6	12.4		ug/L		85	52 - 138	5	50
Ethene	13.5	11.1		ug/L		83	50 - 137	6	50
Methane	7.69	6.51		ug/L		85	48 - 174	4	50

Lab Sample ID: MB 200-72287/3
Matrix: Water
Analysis Batch: 72287

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon dioxide	ND		1000	1000	ug/L			05/19/14 10:26	1

Lab Sample ID: LCS 200-72287/2
Matrix: Water
Analysis Batch: 72287

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Carbon dioxide	5010	4720		ug/L		94	70 - 130

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 480-182503/1-A
Matrix: Water
Analysis Batch: 182809

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 182503

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.050	0.019	mg/L		05/16/14 13:00	05/17/14 10:43	1
Magnesium	ND		0.20	0.043	mg/L		05/16/14 13:00	05/17/14 10:43	1
Manganese	ND		0.0030	0.00040	mg/L		05/16/14 13:00	05/17/14 10:43	1

Lab Sample ID: LCS 480-182503/2-A
Matrix: Water
Analysis Batch: 182809

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 182503

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	10.0	10.20		mg/L		102	80 - 120
Magnesium	10.0	10.34		mg/L		103	80 - 120
Manganese	0.200	0.202		mg/L		101	80 - 120

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 480-182290/124
Matrix: Water
Analysis Batch: 182290

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			05/16/14 14:56	1
Sulfate	ND		2.0	0.35	mg/L			05/16/14 14:56	1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 480-182290/123
Matrix: Water
Analysis Batch: 182290

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	20.07		mg/L		100	90 - 110
Sulfate	20.0	19.39		mg/L		97	90 - 110

Lab Sample ID: MB 480-182869/4
Matrix: Water
Analysis Batch: 182869

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			05/19/14 14:59	1
Sulfate	ND		2.0	0.35	mg/L			05/19/14 14:59	1

Lab Sample ID: LCS 480-182869/3
Matrix: Water
Analysis Batch: 182869

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	20.03		mg/L		100	90 - 110
Sulfate	20.0	19.14		mg/L		96	90 - 110

Lab Sample ID: 480-59866-1 MS
Matrix: Water
Analysis Batch: 182869

Client Sample ID: MW-10-051414
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2580		1250	3772		mg/L		95	90 - 110
Sulfate	453		1250	1661		mg/L		97	90 - 110

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 480-182370/27
Matrix: Water
Analysis Batch: 182370

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.020	0.0090	mg/L			05/15/14 19:26	1

Lab Sample ID: MB 480-182370/3
Matrix: Water
Analysis Batch: 182370

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.020	0.0090	mg/L			05/15/14 19:02	1

Lab Sample ID: LCS 480-182370/28
Matrix: Water
Analysis Batch: 182370

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	1.02		mg/L		102	90 - 110

Method: 350.1 - Nitrogen, Ammonia (Continued)

Lab Sample ID: LCS 480-182370/4
Matrix: Water
Analysis Batch: 182370

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Ammonia			1.00	0.996		mg/L		100	90 - 110		

Lab Sample ID: 480-59866-1 MS
Matrix: Water
Analysis Batch: 182370

Client Sample ID: MW-10-051414
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Ammonia	0.010	J ^	0.200	0.217		mg/L		103	90 - 110		

Method: 9060A - Organic Carbon, Total (TOC)

Lab Sample ID: MB 480-183891/3
Matrix: Water
Analysis Batch: 183891

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		1.0	0.43	mg/L			05/21/14 10:00	1

Lab Sample ID: LCS 480-183891/4
Matrix: Water
Analysis Batch: 183891

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Organic Carbon			60.0	62.57		mg/L		104	90 - 110		

Lab Sample ID: 480-59866-1 DU
Matrix: Water
Analysis Batch: 183891

Client Sample ID: MW-10-051414
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Organic Carbon	3.5			3.43		mg/L				1	20

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 480-182583/29
Matrix: Water
Analysis Batch: 182583

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity	ND		5.0	0.79	mg/L			05/16/14 12:05	1

Lab Sample ID: LCS 480-182583/30
Matrix: Water
Analysis Batch: 182583

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Alkalinity			100	94.56		mg/L		95	90 - 110		

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-59866-1

Method: SM 4500 S2 D - Sulfide, Total

Lab Sample ID: MB 480-183127/3
Matrix: Water
Analysis Batch: 183127

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		0.10	0.052	mg/L			05/20/14 13:04	1

Lab Sample ID: LCS 480-183127/4
Matrix: Water
Analysis Batch: 183127

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfide	0.750	0.702		mg/L		94	90 - 110

QC Association Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-59866-1

GC/MS VOA

Analysis Batch: 182774

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-59866-1	MW-10-051414	Total/NA	Water	8260C	
LCS 480-182774/5	Lab Control Sample	Total/NA	Water	8260C	
MB 480-182774/7	Method Blank	Total/NA	Water	8260C	

GC VOA

Analysis Batch: 72287

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-59866-1	MW-10-051414	Total/NA	Water	RSK-175	
LCS 200-72287/2	Lab Control Sample	Total/NA	Water	RSK-175	
MB 200-72287/3	Method Blank	Total/NA	Water	RSK-175	

Analysis Batch: 182161

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-59866-1	MW-10-051414	Total/NA	Water	RSK-175	
480-59866-1 - DL	MW-10-051414	Total/NA	Water	RSK-175	
LCS 480-182161/4	Lab Control Sample	Total/NA	Water	RSK-175	
LCSD 480-182161/5	Lab Control Sample Dup	Total/NA	Water	RSK-175	
MB 480-182161/3	Method Blank	Total/NA	Water	RSK-175	

Analysis Batch: 185472

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-59866-1	MW-10-051414	Total/NA	Water	AM20GAX	

Metals

Prep Batch: 182503

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-59866-1	MW-10-051414	Total/NA	Water	3005A	
LCS 480-182503/2-A	Lab Control Sample	Total/NA	Water	3005A	
MB 480-182503/1-A	Method Blank	Total/NA	Water	3005A	

Analysis Batch: 182809

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-59866-1	MW-10-051414	Total/NA	Water	6010C	182503
LCS 480-182503/2-A	Lab Control Sample	Total/NA	Water	6010C	182503
MB 480-182503/1-A	Method Blank	Total/NA	Water	6010C	182503

General Chemistry

Analysis Batch: 182138

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-59866-1	MW-10-051414	Total/NA	Water	353.2	

Analysis Batch: 182141

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-59866-1	MW-10-051414	Total/NA	Water	353.2	

General Chemistry (Continued)

Analysis Batch: 182290

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-59866-1	MW-10-051414	Total/NA	Water	300.0	
LCS 480-182290/123	Lab Control Sample	Total/NA	Water	300.0	
MB 480-182290/124	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 182370

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-59866-1	MW-10-051414	Total/NA	Water	350.1	
480-59866-1 MS	MW-10-051414	Total/NA	Water	350.1	
LCS 480-182370/28	Lab Control Sample	Total/NA	Water	350.1	
LCS 480-182370/4	Lab Control Sample	Total/NA	Water	350.1	
MB 480-182370/27	Method Blank	Total/NA	Water	350.1	
MB 480-182370/3	Method Blank	Total/NA	Water	350.1	

Analysis Batch: 182583

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-59866-1	MW-10-051414	Total/NA	Water	SM 2320B	
LCS 480-182583/30	Lab Control Sample	Total/NA	Water	SM 2320B	
MB 480-182583/29	Method Blank	Total/NA	Water	SM 2320B	

Analysis Batch: 182869

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-59866-1	MW-10-051414	Total/NA	Water	300.0	
480-59866-1 MS	MW-10-051414	Total/NA	Water	300.0	
LCS 480-182869/3	Lab Control Sample	Total/NA	Water	300.0	
MB 480-182869/4	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 183127

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-59866-1	MW-10-051414	Total/NA	Water	SM 4500 S2 D	
LCS 480-183127/4	Lab Control Sample	Total/NA	Water	SM 4500 S2 D	
MB 480-183127/3	Method Blank	Total/NA	Water	SM 4500 S2 D	

Analysis Batch: 183891

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-59866-1	MW-10-051414	Total/NA	Water	9060A	
480-59866-1 DU	MW-10-051414	Total/NA	Water	9060A	
LCS 480-183891/4	Lab Control Sample	Total/NA	Water	9060A	
MB 480-183891/3	Method Blank	Total/NA	Water	9060A	

Lab Chronicle

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-59866-1

Client Sample ID: MW-10-051414
Date Collected: 05/14/14 10:15
Date Received: 05/14/14 18:03

Lab Sample ID: 480-59866-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		4	182774	05/19/14 14:48	TRB	TAL BUF
Total/NA	Analysis	AM20GAX		1	185472	05/28/14 09:29	CTB	SC0015
Total/NA	Analysis	RSK-175		1	72287	05/19/14 11:48	NEA	TAL BUR
Total/NA	Analysis	RSK-175		1	182161	05/15/14 08:22	DLE	TAL BUF
Total/NA	Analysis	RSK-175	DL	10	182161	05/15/14 09:30	DLE	TAL BUF
Total/NA	Prep	3005A			182503	05/16/14 13:00	EHD	TAL BUF
Total/NA	Analysis	6010C		1	182809	05/17/14 10:57	MTM2	TAL BUF
Total/NA	Analysis	300.0		10	182290	05/16/14 15:16	KRC	TAL BUF
Total/NA	Analysis	300.0		50	182869	05/19/14 16:10	KRC	TAL BUF
Total/NA	Analysis	350.1		1	182370	05/15/14 19:34	KMF	TAL BUF
Total/NA	Analysis	353.2		1	182138	05/14/14 22:34	CLT	TAL BUF
Total/NA	Analysis	353.2		1	182141	05/14/14 22:34	CLT	TAL BUF
Total/NA	Analysis	9060A		1	183891	05/21/14 12:18	KRC	TAL BUF
Total/NA	Analysis	SM 2320B		1	182583	05/16/14 13:35	VAJ	TAL BUF
Total/NA	Analysis	SM 4500 S2 D		1	183127	05/20/14 13:17	KJ1	TAL BUF

Laboratory References:

SC0015 = Pittsburgh, PA (formerly Microseeps), 220 William Pitt Way, Pittsburgh, PA 15238, TEL (412)826-5245

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL BUR = TestAmerica Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Certification Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-59866-1

Laboratory: TestAmerica Buffalo

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0686	07-06-14
California	State Program	9	1169CA	09-30-14
Connecticut	State Program	1	PH-0568	09-30-14
Florida	NELAP	4	E87672	06-30-14
Georgia	State Program	4	N/A	03-31-15
Illinois	NELAP	5	200003	09-30-14
Iowa	State Program	7	374	03-01-15
Kansas	NELAP	7	E-10187	01-31-15
Kentucky (DW)	State Program	4	90029	12-31-14
Kentucky (UST)	State Program	4	30	03-31-15
Louisiana	NELAP	6	02031	06-30-14
Maine	State Program	1	NY00044	12-04-14
Maryland	State Program	3	294	03-31-15
Massachusetts	State Program	1	M-NY044	06-30-14
Michigan	State Program	5	9937	03-31-15
Minnesota	NELAP	5	036-999-337	12-31-14
New Hampshire	NELAP	1	2337	11-17-14
New Jersey	NELAP	2	NY455	06-30-14
New York	NELAP	2	10026	03-31-15
North Dakota	State Program	8	R-176	03-31-14 *
Oklahoma	State Program	6	9421	08-31-14
Oregon	NELAP	10	NY200003	06-09-14
Pennsylvania	NELAP	3	68-00281	07-31-14
Rhode Island	State Program	1	LAO00328	12-30-14
Tennessee	State Program	4	TN02970	03-31-15
Texas	NELAP	6	T104704412-11-2	07-31-14
USDA	Federal		P330-11-00386	11-22-14
Virginia	NELAP	3	460185	09-14-14
Washington	State Program	10	C784	02-10-15
Wisconsin	State Program	5	998310390	08-31-14

Laboratory: TestAmerica Burlington

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Connecticut	State Program	1	PH-0751	09-30-15
DE Haz. Subst. Cleanup Act (HSCA)	State Program	3	NA	02-13-15
Florida	NELAP	4	E87467	06-30-14 *
L-A-B	DoD ELAP		L2336	02-26-17
Louisiana	NELAP	6	176292	06-30-14
Maine	State Program	1	VT00008	04-17-15
Minnesota	NELAP	5	050-999-436	12-31-14
New Hampshire	NELAP	1	2006	12-18-14
New Jersey	NELAP	2	VT972	06-30-14 *
New York	NELAP	2	10391	03-31-15
Pennsylvania	NELAP	3	68-00489	04-30-15
Rhode Island	State Program	1	LAO00298	12-30-14
US Fish & Wildlife	Federal		LE-058448-0	02-28-15
USDA	Federal		P330-11-00093	10-28-16
Vermont	State Program	1	VT-4000	12-31-14

* Expired certification is currently pending renewal and is considered valid.

Certification Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-59866-1

Laboratory: TestAmerica Burlington (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Virginia	NELAP	3	460209	12-14-14

Method Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-59866-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	TAL BUF
AM20GAX	Dissolved Gases (GC)	NONE	SC0015
RSK-175	Dissolved Gases (GC)	RSK	TAL BUR
RSK-175	Dissolved Gases (GC)	RSK	TAL BUF
6010C	Metals (ICP)	SW846	TAL BUF
300.0	Anions, Ion Chromatography	MCAWW	TAL BUF
350.1	Nitrogen, Ammonia	MCAWW	TAL BUF
353.2	Nitrate	EPA	TAL BUF
353.2	Nitrogen, Nitrite	MCAWW	TAL BUF
9060A	Organic Carbon, Total (TOC)	SW846	TAL BUF
SM 2320B	Alkalinity	SM	TAL BUF
SM 4500 S2 D	Sulfide, Total	SM	TAL BUF

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

NONE = NONE

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

SC0015 = Pittsburgh, PA (formerly Microseeps), 220 William Pitt Way, Pittsburgh, PA 15238, TEL (412)826-5245

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL BUR = TestAmerica Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Sample Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-59866-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-59866-1	MW-10-051414	Water	05/14/14 10:15	05/14/14 18:03

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

June 2, 2014

Melissa Deyo
Test America
10 Hazelwood Drive
Buffalo, NY 14228

RE: **GM-Lockport / 480-59866-1**
Microseeps Workorder: 12194

Dear Melissa Deyo:

Enclosed are the analytical results for sample(s) received by the laboratory on Friday, May 16, 2014. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Robbin Robl 06/02/2014
rrobl@microseeps.com

Customer Service Representative

Enclosures

As a valued client we would appreciate your comments on our service.
Please email info@microseeps.com.

Total Number of Pages 11

CERTIFICATE OF ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

LABORATORY ACCREDITATIONS & CERTIFICATIONS

Accreditor:	Pennsylvania Department of Environmental Protection, Bureau of Laboratories
Accreditation ID:	02-00538
Scope:	NELAP Non-Potable Water and Solid & Hazardous Waste
Accreditor:	NELAP: State of Florida, Department of Health, Bureau of Laboratories
Accreditation ID:	E87832
Scope:	Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)
Accreditor:	South Carolina Department of Health and Environmental Control, Office of Environmental Laboratory Certification
Accreditation ID:	89009003
Scope:	Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA)
Accreditor:	NELAP: State of Louisiana, Department of Environmental Quality
Accreditation ID:	04104
Scope:	Solid and Chemical Materials; Non-Potable Water
Accreditor:	NELAP: New Jersey, Department of Environmental Protection
Accreditation ID:	PA026
Scope:	Non-Potable Water; Solid and Chemical Materials
Accreditor:	NELAP: New York, Department of Health Wadsworth Center
Accreditation ID:	11815
Scope:	Non-Potable Water; Solid and Hazardous Waste
Accreditor:	State of Connecticut, Department of Public Health, Division of Environmental Health
Accreditation ID:	PH-0263
Scope:	Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)
Accreditor:	NELAP: Texas, Commission on Environmental Quality
Accreditation ID:	T104704453-09-TX
Scope:	Non-Potable Water
Accreditor:	State of New Hampshire
Accreditation ID:	299409
Scope:	Non-potable water
Accreditor:	State of Georgia
Accreditation ID:	Chapter 391-3-26
Scope:	As per the Georgia EPD Rules and Regulations for Commercial Laboratories, Microseeps is accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

CERTIFICATE OF ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

SAMPLE SUMMARY

Workorder: 12194 GM-Lockport / 480-59866-1

Lab ID	Sample ID	Matrix	Date Collected	Date Received
121940001	MW-10-051414(480-59866-1)	Bubble Strip	5/14/2014 10:55	5/16/2014 11:30

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 12194 GM-Lockport / 480-59866-1

Lab ID: **121940001** Date Received: 5/16/2014 11:30 Matrix: Bubble Strip
Sample ID: **MW-10-051414(480-59866-1)** Date Collected: 5/14/2014 10:55

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
RISK - MICR										
Analysis Desc: AM20GAX			Analytical Method: AM20GAX							
Hydrogen	**0.95**	nM	0.60	0.13	1			5/28/2014 09:29	GT	

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS QUALIFIERS

Workorder: 12194 GM-Lockport / 480-59866-1

DEFINITIONS/QUALIFIERS

Disclaimer : The Pennsylvania Department of Environmental Protection (PADEP) has decided to no longer recognize analyses that do not produce data for primary compliance, for NELAP accreditation. The methods affected by this decision are AM20GAx, AM21G, SW846 7199 and AM4.02. The laboratory shall continue to administer the NELAP/TNI standard requirements in the performance of these methods.

MDL	Method Detection Limit. Can be used synonymously with LOD; Limit Of Detection.
PQL	Practical Quanitation Limit. Can be used synonymously with LOQ; Limit Of Quantitation.
ND	Not detected at or above reporting limit.
DF	Dilution Factor.
S	Surrogate.
RPD	Relative Percent Difference.
% Rec	Percent Recovery.
U	Indicates the compound was analyzed for, but not detected at or above the noted concentration.
J	Estimated concentration greater than the set method detection limit (MDL) and less than the set reporting limit (PQL).

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

QUALITY CONTROL DATA

Workorder: 12194 GM-Lockport / 480-59866-1

QC Batch: DISG/3800 Analysis Method: AM20GAX

QC Batch Method: AM20GAX

Associated Lab Samples: 121940001

METHOD BLANK: 27980

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Hydrogen	nM	0.60 U	0.60	

LABORATORY CONTROL SAMPLE & LCSD: 27981 27982

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
RISK										
Hydrogen	nM	24	22	22	92	92	80-120	0	20	

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 12194 GM-Lockport / 480-59866-1

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
121940001	MW-10-051414(480-59866-1)			AM20GAX	DISG/3800

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Deyo, Melissa L	Carrier Tracking No(s):	COC No: 480-16388.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: melissa.deyo@testamericainc.com		Page: Page 1 of 1
Company: Pace Analytical Services, Inc.		**Analysis Requested**		Job #: 480-59866-1
Address: 220 William Pitt Way,	Due Date Requested: 5/27/2014			**Preservation Codes:**
City: Pittsburgh	TAT Requested (days):			A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
State, Zip: PA, 15238				Other:
Phone: 412-826-5245(Tel)	PO #:			
Email:	WO #:			
Project Name: 058507, GM-Lockport Groundwater Sampling	Project #: 48004014			
Site:	SSOW#:			

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	AM20GAX/ Hydrogen	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
MW-10-051414 (480-59866-1)	5/14/14	10:15 Eastern		Water			X	1	

Possible Hazard Identification *Unconfirmed*		***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For _____ Months*	
Deliverable Requested: I, II, III, IV, Other (specify)		Special Instructions/QC Requirements:	
Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by: C.Kolb	Date/Time: 05/15/14 1700	Company TA	Received by:	Date/Time: 5.16.14 1130	Company PAES
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ∆ Yes ∆ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

6/3/2014

NON-CONFORMANCE FORM

Microseeps Project Number: 12194

Date: 5.16.14 Time of Receipt: 1130 Receiver: LY

Client: TA Buffalo

REASON FOR NON-CONFORMANCE:

1. COC time was 10:15 while vial time was 10:55.
2. Requested resulted 5/27/14

ACTION TAKEN:

Client name: Melissa Deyo/ TA Buffalo Date: 5.20.14 Time: E-mail.

Use Sample time on vials
Stand TAT is Fine
ok to Proceed.

Customer Service Initials: [signature] Date: 5.20.14

Chris Thomas

From: Deyo, Melissa <Melissa.Deyo@testamericainc.com>
Sent: Monday, May 19, 2014 3:23 PM
To: Chris Thomas
Subject: RE: 058507 GM-LOCKPORT GROUNDWATER SAMPLING

Chris,

Please analyze at a standard turn around time. I will check with my client about the sample collection date and get back to you.

MELISSA DEYO
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

10 Hazelwood Drive
Amherst, NY 14228
Tel 716.504.9874 | Fax 716.691.7991
www.testamericainc.com

From: Chris Thomas [mailto:CThomas@microseeps.com]
Sent: Monday, May 19, 2014 3:01 PM
To: Deyo, Melissa
Subject: 058507 GM-LOCKPORT GROUNDWATER SAMPLING

Melissa,

We received samples for the 058507 GM-LOCKPORT GROUNDWATER SAMPLING project. I have attached a copy of the COC. The COC time was 10:15 however the time on the vials was 10:55. Also, the COC has 5/27/14 as a due date. That would make it a 6 day TAT. If you could please let us know what time to use for log-in we can proceed with the analysis. Also, please confirm that you want a 6 day TAT and I can check with the lab manager to verify we can accommodate this TAT.

Thanks,
Chris

Christopher Thomas
Microseeps, a Division of Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238

Office: 412-826-5245
Direct: 412-826-4481

Disclaimer: This message contains confidential information and is intended only for the individual(s) named. If you are not the named addressee, you should permanently delete this e-mail from your system and should not disseminate, distribute or copy this e-mail. E-mail transmission cannot be guaranteed to be secure or error-free as information delivered over the internet could be corrupted, lost, destroyed, delayed, or contain viruses

Chris Thomas

From: Deyo, Melissa <Melissa.Deyo@testamericainc.com>
Sent: Monday, May 19, 2014 3:50 PM
To: Chris Thomas
Subject: RE: 058507 GM-LOCKPORT GROUNDWATER SAMPLING

Please use the sample collection time on the vials.

MELISSA DEYO
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

10 Hazelwood Drive
Amherst, NY 14228
Tel 716.504.9874 | Fax 716.691.7991
www.testamericainc.com

From: Chris Thomas [mailto:CThomas@microseeps.com]
Sent: Monday, May 19, 2014 3:01 PM
To: Deyo, Melissa
Subject: 058507 GM-LOCKPORT GROUNDWATER SAMPLING

Melissa,

We received samples for the 058507 GM-LOCKPORT GROUNDWATER SAMPLING project. I have attached a copy of the COC. The COC time was 10:15 however the time on the vials was 10:55. Also, the COC has 5/27/14 as a due date. That would make it a 6 day TAT. If you could please let us know what time to use for log-in we can proceed with the analysis. Also, please confirm that you want a 6 day TAT and I can check with the lab manager to verify we can accommodate this TAT.

Thanks,
Chris

Christopher Thomas
Microseeps, a Division of Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238

Office: 412-826-5245
Direct: 412-826-4481

Disclaimer: This message contains confidential information and is intended only for the individual(s) named. If you are not the named addressee, you should permanently delete this e-mail from your system and should not disseminate, distribute or copy this e-mail. E-mail transmission cannot be guaranteed to be secure or error-free as information delivered over the internet could be corrupted, lost, destroyed, delayed, or contain viruses

TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: T. Bohlen	Lab PM: Deyo, Melissa L	Carrier Tracking No(s):	COC No: 480-49375-13138.4
Client Contact: Mr. Tom Bohlen	Phone: 716 685-2300	E-Mail: melissa.deyo@testamericainc.com		Page: Page 4 of 4
Company: GZA GeoEnvironmental, Inc.				Job #: 58546.00
Address: 535 Washington Street 11th Floor	Due Date Requested:			
City: Buffalo	TAT Requested (days):			
State, Zip: NY, 14203				
Phone:	PO #: 4062165			
Email: thomas.bohlen@gza.com	WO #: 58507			
Project Name: 058507, GM-Lockport Groundwater Sampling	Project #: 48004014			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	RSK_175_CO2 - Carbon dioxide	350.1 - Ammonia	6010B - Metals - Fe, Mn, Mg	8260B - PCE, TCE, DCE (trans and cis), Vinyl Chl	9060 - Total Organic Carbon	RSK_175 - Methane, Ethane, Ethene	SM4500_S2_D - Sulfide	353.2, 353.2_Nitrite, Nitrate_Calc	2320B - Total Alkalinity	300.0_28D - Anions (Chloride & Sulfate)	AM20GAX	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	S	D	A	A	A	CB	N	N	N			
MW-10-051414	5/14/14	1015	G	Water	N	N	X	X	X	X	X	X	X	X	X	X	X		* Dissolved H2 for Microseeps
				Water															
				Water															
				Water															
				Water															
				Water															

480-59866 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by: Thomas Bohlen	5/14/14/ 1803	GZA		5/14/14 1803	TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 5.6 #1

Login Sample Receipt Checklist

Client: Conestoga-Rovers & Associates, Inc.

Job Number: 480-59866-1

Login Number: 59866

List Source: TestAmerica Buffalo

List Number: 1

Creator: Kolb, Chris M

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	gza
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	

Login Sample Receipt Checklist

Client: Conestoga-Rovers & Associates, Inc.

Job Number: 480-59866-1

Login Number: 59866
List Number: 2
Creator: Marion, Greg T

List Source: TestAmerica Burlington
List Creation: 05/16/14 04:20 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	877444, 467
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	5.0,1.2ºC IR GUN ID 181/CF=0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	N/A	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

TestAmerica Job ID: 480-60149-1

Client Project/Site: 058507, GM-Lockport Groundwater Sampling

For:

Conestoga-Rovers & Associates, Inc.
2055 Niagara Falls Blvd., Suite 3
Niagara Falls, New York 14304

Attn: Kathleen Willy

Authorized for release by:
6/3/2014 5:36:56 PM
Rebecca Jones, Project Management Assistant I
rebecca.jones@testamericainc.com

Designee for

Melissa Deyo, Project Manager I
(716)504-9874
melissa.deyo@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Cover Page 1
Table of Contents 2
Definitions/Glossary 3
Case Narrative 4
Detection Summary 5
Client Sample Results 6
Surrogate Summary 8
QC Sample Results 9
QC Association Summary 19
Lab Chronicle 22
Certification Summary 23
Method Summary 25
Sample Summary 26
Subcontract Data 27
Chain of Custody 36
Receipt Checklists 37

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC VOA

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

Metals

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

General Chemistry

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery exceeds the control limits
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC exceeds the control limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60149-1

Job ID: 480-60149-1

Laboratory: TestAmerica Buffalo

Narrative

Job Narrative
480-60149-1

Receipt
The samples were received on 5/19/2014 4:35 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.6º C.

GC/MS VOA
Method(s) 8260C: The following sample(s) was diluted to bring the concentration of target analytes within the calibration range: MW-12-051914 (480-60149-2). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

IC
Method(s) 300.0: The following sample(s) was diluted to bring the concentration of target analytes within the calibration range: MW-12-051914 (480-60149-2). Elevated reporting limits (RLs) are provided.

Method(s) 300.0: The following sample(s) was diluted to bring the concentration of target analytes within the calibration range: MW-12-051914 (480-60149-2), MW-15-051914 (480-60149-1), MW-15-051914 (480-60149-1 MS), MW-15-051914 (480-60149-1 MSD). Elevated reporting limits (RLs) are provided.

Method(s) 300.0: The following samples were diluted to bring the concentration of target analytes within the calibration range: MW-15-051914 (480-60149-1), MW-15-051914 (480-60149-1 MS), MW-15-051914 (480-60149-1 MSD). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC VOA
Method(s) RSK-175: The following sample was diluted to bring the concentration of target analytes within the calibration range: MW-12-051914 (480-60149-2). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60149-1

Client Sample ID: MW-15-051914 — Lab Sample ID: 480-60149-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Tetrachloroethene	6.2		1.0	0.36	ug/L	1		8260C	Total/NA
Trichloroethene	0.64	J	1.0	0.46	ug/L	1		8260C	Total/NA
Hydrogen	0.83		0.60		nm	1		AM20GAX	Total/NA
Magnesium	42.5		0.20	0.043	mg/L	1		6010C	Total/NA
Manganese	0.11		0.0030	0.00040	mg/L	1		6010C	Total/NA
Chloride	590		5.0	2.8	mg/L	10		300.0	Total/NA
Sulfate	55.2		20.0	3.5	mg/L	10		300.0	Total/NA
Ammonia	0.033		0.020	0.0090	mg/L	1		350.1	Total/NA
Nitrate	0.46		0.050	0.020	mg/L	1		353.2	Total/NA
Total Organic Carbon	2.2		1.0	0.43	mg/L	1		9060A	Total/NA
Total Alkalinity	439		5.0	0.79	mg/L	1		SM 2320B	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Carbon dioxide	21000		1000	1000	ug/L	1		RSK-175	Total/NA

Client Sample ID: MW-12-051914 — Lab Sample ID: 480-60149-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	130		2.0	1.6	ug/L	2		8260C	Total/NA
Tetrachloroethene	2.0		2.0	0.72	ug/L	2		8260C	Total/NA
Trichloroethene	7.4		2.0	0.92	ug/L	2		8260C	Total/NA
Vinyl chloride	44		2.0	1.8	ug/L	2		8260C	Total/NA
Hydrogen	33		0.60		nm	1		AM20GAX	Total/NA
Methane - DL	110		40	10	ug/L	10		RSK-175	Total/NA
Iron	3.7		0.050	0.019	mg/L	1		6010C	Total/NA
Magnesium	50.0		0.20	0.043	mg/L	1		6010C	Total/NA
Manganese	4.9		0.0030	0.00040	mg/L	1		6010C	Total/NA
Chloride	1650		25.0	14.1	mg/L	50		300.0	Total/NA
Sulfate	96.5		10.0	1.7	mg/L	5		300.0	Total/NA
Ammonia	1.2		0.020	0.0090	mg/L	1		350.1	Total/NA
Nitrate	0.032	J	0.050	0.020	mg/L	1		353.2	Total/NA
Total Organic Carbon	4.0		1.0	0.43	mg/L	1		9060A	Total/NA
Total Alkalinity	291		5.0	0.79	mg/L	1		SM 2320B	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Carbon dioxide	16000		1000	1000	ug/L	1		RSK-175	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-15-051914

Lab Sample ID: 480-60149-1

Date Collected: 05/19/14 11:35

Matrix: Water

Date Received: 05/19/14 16:35

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			05/21/14 15:31	1
Tetrachloroethene	**6.2**		1.0	0.36	ug/L			05/21/14 15:31	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			05/21/14 15:31	1
Trichloroethene	**0.64**	**J**	1.0	0.46	ug/L			05/21/14 15:31	1
Vinyl chloride	ND		1.0	0.90	ug/L			05/21/14 15:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*66 - 137*		*05/21/14 15:31*	*1*
4-Bromofluorobenzene (Surr)	*99*		*73 - 120*		*05/21/14 15:31*	*1*
Toluene-d8 (Surr)	*96*		*71 - 126*		*05/21/14 15:31*	*1*
Dibromofluoromethane (Surr)	*103*		*60 - 140*		*05/21/14 15:31*	*1*

Method: AM20GAX - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hydrogen	**0.83**		0.60		nm			05/28/14 09:45	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	ND		7.5	1.5	ug/L			05/20/14 08:55	1
Ethene	ND		7.0	1.5	ug/L			05/20/14 08:55	1
Methane	ND		4.0	1.0	ug/L			05/20/14 08:55	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon dioxide	**21000**		1000	1000	ug/L			05/27/14 15:31	1

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.050	0.019	mg/L		05/20/14 08:10	05/21/14 17:31	1
Magnesium	**42.5**		0.20	0.043	mg/L		05/20/14 08:10	05/21/14 17:31	1
Manganese	**0.11**		0.0030	0.00040	mg/L		05/20/14 08:10	05/21/14 17:31	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**590**		5.0	2.8	mg/L			05/21/14 20:15	10
Sulfate	**55.2**		20.0	3.5	mg/L			05/22/14 15:04	10
Ammonia	**0.033**		0.020	0.0090	mg/L			05/23/14 14:38	1
Nitrate	**0.46**		0.050	0.020	mg/L			05/20/14 12:42	1
Nitrite	ND		0.050	0.020	mg/L			05/20/14 12:42	1
Total Organic Carbon	**2.2**		1.0	0.43	mg/L			05/26/14 20:51	1
Total Alkalinity	**439**		5.0	0.79	mg/L			05/20/14 13:48	1
Sulfide	ND		0.10	0.052	mg/L			05/21/14 12:53	1

Client Sample ID: MW-12-051914

Lab Sample ID: 480-60149-2

Date Collected: 05/19/14 15:40

Matrix: Water

Date Received: 05/19/14 16:35

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	**130**		2.0	1.6	ug/L			05/21/14 15:55	2
Tetrachloroethene	**2.0**		2.0	0.72	ug/L			05/21/14 15:55	2
trans-1,2-Dichloroethene	ND		2.0	1.8	ug/L			05/21/14 15:55	2

Client Sample ID: MW-12-051914

Date Collected: 05/19/14 15:40
Date Received: 05/19/14 16:35

Lab Sample ID: 480-60149-2

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Trichloroethene	7.4		2.0	0.92	ug/L			05/21/14 15:55	2
Vinyl chloride	44		2.0	1.8	ug/L			05/21/14 15:55	2

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*66 - 137*		*05/21/14 15:55*	*2*
4-Bromofluorobenzene (Surr)	*104*		*73 - 120*		*05/21/14 15:55*	*2*
Toluene-d8 (Surr)	*98*		*71 - 126*		*05/21/14 15:55*	*2*
Dibromofluoromethane (Surr)	*106*		*60 - 140*		*05/21/14 15:55*	*2*

Method: AM20GAX - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hydrogen	33		0.60		nm			05/28/14 09:59	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	ND		7.5	1.5	ug/L			05/20/14 09:28	1
Ethene	ND		7.0	1.5	ug/L			05/20/14 09:28	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon dioxide	16000		1000	1000	ug/L			05/27/14 15:58	1

Method: RSK-175 - Dissolved Gases (GC) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	110		40	10	ug/L			05/20/14 09:55	10

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	3.7		0.050	0.019	mg/L		05/20/14 08:10	05/21/14 17:50	1
Magnesium	50.0		0.20	0.043	mg/L		05/20/14 08:10	05/21/14 17:50	1
Manganese	4.9		0.0030	0.00040	mg/L		05/20/14 08:10	05/21/14 17:50	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1650		25.0	14.1	mg/L			05/21/14 21:06	50
Sulfate	96.5		10.0	1.7	mg/L			05/21/14 00:51	5
Ammonia	1.2		0.020	0.0090	mg/L			05/23/14 14:40	1
Nitrate	0.032	J	0.050	0.020	mg/L			05/20/14 10:44	1
Nitrite	ND		0.050	0.020	mg/L			05/20/14 10:44	1
Total Organic Carbon	4.0		1.0	0.43	mg/L			05/24/14 17:01	1
Total Alkalinity	291		5.0	0.79	mg/L			05/20/14 14:24	1
Sulfide	ND		0.10	0.052	mg/L			05/21/14 13:11	1

Surrogate Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60149-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		12DCE	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(66-137)	(73-120)	(71-126)	(60-140)
480-60149-1	MW-15-051914	109	99	96	103
480-60149-1 MS	MW-15-051914	109	105	98	111
480-60149-1 MSD	MW-15-051914	108	107	97	107
480-60149-2	MW-12-051914	109	104	98	106
LCS 480-183278/5	Lab Control Sample	108	108	100	106
MB 480-183278/8	Method Blank	111	101	96	107

Surrogate Legend

12DCE = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 480-183278/8
Matrix: Water
Analysis Batch: 183278

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			05/21/14 11:46	1
Tetrachloroethene	ND		1.0	0.36	ug/L			05/21/14 11:46	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			05/21/14 11:46	1
Trichloroethene	ND		1.0	0.46	ug/L			05/21/14 11:46	1
Vinyl chloride	ND		1.0	0.90	ug/L			05/21/14 11:46	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*66 - 137*		*05/21/14 11:46*	*1*
4-Bromofluorobenzene (Surr)	*101*		*73 - 120*		*05/21/14 11:46*	*1*
Toluene-d8 (Surr)	*96*		*71 - 126*		*05/21/14 11:46*	*1*
Dibromofluoromethane (Surr)	*107*		*60 - 140*		*05/21/14 11:46*	*1*

Lab Sample ID: LCS 480-183278/5
Matrix: Water
Analysis Batch: 183278

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,2-Dichloroethene	25.0	25.6		ug/L		103	74 - 124
Tetrachloroethene	25.0	26.7		ug/L		107	74 - 122
trans-1,2-Dichloroethene	25.0	25.3		ug/L		101	73 - 127
Trichloroethene	25.0	25.7		ug/L		103	74 - 123

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*108*		*66 - 137*
4-Bromofluorobenzene (Surr)	*108*		*73 - 120*
Toluene-d8 (Surr)	*100*		*71 - 126*
Dibromofluoromethane (Surr)	*106*		*60 - 140*

Lab Sample ID: 480-60149-1 MS
Matrix: Water
Analysis Batch: 183278

Client Sample ID: MW-15-051914
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,2-Dichloroethene	ND		25.0	25.9		ug/L		104	74 - 124
Tetrachloroethene	6.2		25.0	33.1		ug/L		108	74 - 122
trans-1,2-Dichloroethene	ND		25.0	25.4		ug/L		102	73 - 127
Trichloroethene	0.64	J	25.0	26.7		ug/L		104	74 - 123

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*109*		*66 - 137*
4-Bromofluorobenzene (Surr)	*105*		*73 - 120*
Toluene-d8 (Surr)	*98*		*71 - 126*
Dibromofluoromethane (Surr)	*111*		*60 - 140*

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: 480-60149-1 MSD
Matrix: Water
Analysis Batch: 183278

Client Sample ID: MW-15-051914
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
cis-1,2-Dichloroethene	ND		25.0	25.6		ug/L		102	74 - 124	1	15
Tetrachloroethene	6.2		25.0	32.8		ug/L		106	74 - 122	1	20
trans-1,2-Dichloroethene	ND		25.0	25.0		ug/L		100	73 - 127	2	20
Trichloroethene	0.64	J	25.0	26.8		ug/L		105	74 - 123	1	16

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*108*		*66 - 137*
4-Bromofluorobenzene (Surr)	*107*		*73 - 120*
Toluene-d8 (Surr)	*97*		*71 - 126*
Dibromofluoromethane (Surr)	*107*		*60 - 140*

Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 480-182966/3
Matrix: Water
Analysis Batch: 182966

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	ND		7.5	1.5	ug/L			05/20/14 07:58	1
Ethene	ND		7.0	1.5	ug/L			05/20/14 07:58	1
Methane	ND		4.0	1.0	ug/L			05/20/14 07:58	1

Lab Sample ID: LCS 480-182966/4
Matrix: Water
Analysis Batch: 182966

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ethane	14.6	15.2		ug/L		104	52 - 138
Ethene	13.5	13.6		ug/L		101	50 - 137
Methane	7.69	8.16		ug/L		106	48 - 174

Lab Sample ID: 480-60149-1 MS
Matrix: Water
Analysis Batch: 182966

Client Sample ID: MW-15-051914
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ethane	ND		14.6	17.6		ug/L		121	23 - 176
Ethene	ND		13.5	15.9		ug/L		118	29 - 178
Methane	ND		7.69	9.90		ug/L		129	48 - 174

Lab Sample ID: 480-60149-1 MSD
Matrix: Water
Analysis Batch: 182966

Client Sample ID: MW-15-051914
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ethane	ND		14.6	14.0		ug/L		96	23 - 176	23	50
Ethene	ND		13.5	12.9		ug/L		96	29 - 178	21	50
Methane	ND		7.69	7.73		ug/L		101	48 - 174	25	50

Method: RSK-175 - Dissolved Gases (GC) (Continued)

Lab Sample ID: MB 200-72640/13
Matrix: Water
Analysis Batch: 72640

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon dioxide	ND		1000	1000	ug/L			05/27/14 13:42	1

Lab Sample ID: LCS 200-72640/12
Matrix: Water
Analysis Batch: 72640

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Carbon dioxide	5010	5400		ug/L		108	70 - 130

Lab Sample ID: 480-60149-1 MS
Matrix: Water
Analysis Batch: 72640

Client Sample ID: MW-15-051914
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Carbon dioxide	21000		5010	28100	4	ug/L		133	70 - 130

Lab Sample ID: MB 200-72800/3
Matrix: Water
Analysis Batch: 72800

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon dioxide	ND		1000	1000	ug/L			05/29/14 12:18	1

Lab Sample ID: LCS 200-72800/2
Matrix: Water
Analysis Batch: 72800

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Carbon dioxide	5010	5400		ug/L		108	70 - 130

Lab Sample ID: 480-60149-1 MSD
Matrix: Water
Analysis Batch: 72800

Client Sample ID: MW-15-051914
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Carbon dioxide	21000		5010	27400	4	ug/L		120	70 - 130	2	30

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 480-182961/1-A
Matrix: Water
Analysis Batch: 183496

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 182961

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.050	0.019	mg/L		05/20/14 08:10	05/21/14 16:57	1
Magnesium	ND		0.20	0.043	mg/L		05/20/14 08:10	05/21/14 16:57	1
Manganese	ND		0.0030	0.00040	mg/L		05/20/14 08:10	05/21/14 16:57	1

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: LCS 480-182961/2-A
Matrix: Water
Analysis Batch: 183496

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 182961

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	10.0	10.11		mg/L		101	80 - 120
Magnesium	10.0	10.46		mg/L		105	80 - 120
Manganese	0.200	0.208		mg/L		104	80 - 120

Lab Sample ID: 480-60149-1 MS
Matrix: Water
Analysis Batch: 183496

Client Sample ID: MW-15-051914
Prep Type: Total/NA
Prep Batch: 182961

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	ND		10.0	9.96		mg/L		100	75 - 125
Magnesium	42.5		10.0	52.99	4	mg/L		105	75 - 125
Manganese	0.11		0.200	0.316		mg/L		103	75 - 125

Lab Sample ID: 480-60149-1 MSD
Matrix: Water
Analysis Batch: 183496

Client Sample ID: MW-15-051914
Prep Type: Total/NA
Prep Batch: 182961

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Iron	ND		10.0	10.03		mg/L		100	75 - 125	1	20
Magnesium	42.5		10.0	52.36	4	mg/L		99	75 - 125	1	20
Manganese	0.11		0.200	0.314		mg/L		102	75 - 125	0	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 480-183081/52
Matrix: Water
Analysis Batch: 183081

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			05/20/14 23:50	1
Sulfate	ND		2.0	0.35	mg/L			05/20/14 23:50	1

Lab Sample ID: LCS 480-183081/51
Matrix: Water
Analysis Batch: 183081

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	18.96		mg/L		95	90 - 110
Sulfate	20.0	19.88		mg/L		99	90 - 110

Lab Sample ID: MB 480-183353/28
Matrix: Water
Analysis Batch: 183353

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			05/21/14 19:14	1
Sulfate	ND	^	2.0	0.35	mg/L			05/21/14 19:14	1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 480-183353/27
Matrix: Water
Analysis Batch: 183353

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride			20.0	19.46		mg/L		97	90 - 110		
Sulfate			20.0	20.78	^	mg/L		104	90 - 110		

Lab Sample ID: 480-60149-1 MS
Matrix: Water
Analysis Batch: 183353

Client Sample ID: MW-15-051914
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride	590		250	771.6	F1	mg/L		73	90 - 110		

Lab Sample ID: 480-60149-1 MSD
Matrix: Water
Analysis Batch: 183353

Client Sample ID: MW-15-051914
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	590		250	758.4	F1	mg/L		67	90 - 110	2	20

Lab Sample ID: MB 480-183566/4
Matrix: Water
Analysis Batch: 183566

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			05/22/14 14:24	1
Sulfate	ND		2.0	0.35	mg/L			05/22/14 14:24	1

Lab Sample ID: LCS 480-183566/3
Matrix: Water
Analysis Batch: 183566

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride			20.0	20.02		mg/L		100	90 - 110		
Sulfate			20.0	19.15		mg/L		96	90 - 110		

Lab Sample ID: 480-60149-1 MS
Matrix: Water
Analysis Batch: 183566

Client Sample ID: MW-15-051914
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfate	55.2		250	320.6		mg/L		106	90 - 110		

Lab Sample ID: 480-60149-1 MSD
Matrix: Water
Analysis Batch: 183566

Client Sample ID: MW-15-051914
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	55.2		250	325.7		mg/L		108	90 - 110	2	20

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 480-183971/51
Matrix: Water
Analysis Batch: 183971

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.020	0.0090	mg/L			05/23/14 14:11	1

Lab Sample ID: MB 480-183971/75
Matrix: Water
Analysis Batch: 183971

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.020	0.0090	mg/L			05/23/14 14:35	1

Lab Sample ID: LCS 480-183971/52
Matrix: Water
Analysis Batch: 183971

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	0.990		mg/L		99	90 - 110

Lab Sample ID: LCS 480-183971/76
Matrix: Water
Analysis Batch: 183971

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	0.990		mg/L		99	90 - 110

Lab Sample ID: 480-60149-1 MS
Matrix: Water
Analysis Batch: 183971

Client Sample ID: MW-15-051914
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	0.033		0.200	0.144	F1	mg/L		55	90 - 110

Lab Sample ID: 480-60149-1 MSD
Matrix: Water
Analysis Batch: 183971

Client Sample ID: MW-15-051914
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ammonia	0.033		0.200	0.144	F1	mg/L		56	90 - 110	0	20

Method: 353.2 - Nitrogen, Nitrite

Lab Sample ID: MB 480-183103/3
Matrix: Water
Analysis Batch: 183103

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrite	ND		0.050	0.020	mg/L			05/20/14 12:40	1

Method: 353.2 - Nitrogen, Nitrite (Continued)

Lab Sample ID: LCS 480-183103/4
Matrix: Water
Analysis Batch: 183103

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Nitrite			1.50	1.60		mg/L		107	90 - 110		

Lab Sample ID: 480-60149-1 MS
Matrix: Water
Analysis Batch: 183103

Client Sample ID: MW-15-051914
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Nitrite	ND		1.00	1.13	F1	mg/L		113	90 - 110		

Lab Sample ID: 480-60149-1 MSD
Matrix: Water
Analysis Batch: 183103

Client Sample ID: MW-15-051914
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrite	ND		1.00	1.07		mg/L		107	90 - 110	5	20

Method: 9060A - Organic Carbon, Total (TOC)

Lab Sample ID: MB 480-184059/27
Matrix: Water
Analysis Batch: 184059

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		1.0	0.43	mg/L			05/23/14 19:41	1

Lab Sample ID: MB 480-184059/55
Matrix: Water
Analysis Batch: 184059

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		1.0	0.43	mg/L			05/24/14 13:58	1

Lab Sample ID: LCS 480-184059/28
Matrix: Water
Analysis Batch: 184059

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Organic Carbon			60.0	60.09		mg/L		100	90 - 110		

Lab Sample ID: LCS 480-184059/56
Matrix: Water
Analysis Batch: 184059

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Organic Carbon			60.0	59.82		mg/L		100	90 - 110		

Method: 9060A - Organic Carbon, Total (TOC) (Continued)

Lab Sample ID: MB 480-184514/18
Matrix: Water
Analysis Batch: 184514

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		1.0	0.43	mg/L			05/26/14 23:50	1

Lab Sample ID: MB 480-184514/3
Matrix: Water
Analysis Batch: 184514

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		1.0	0.43	mg/L			05/26/14 13:56	1

Lab Sample ID: LCS 480-184514/19
Matrix: Water
Analysis Batch: 184514

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	60.0	58.82		mg/L		98	90 - 110

Lab Sample ID: LCS 480-184514/4
Matrix: Water
Analysis Batch: 184514

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	60.0	61.76		mg/L		103	90 - 110

Lab Sample ID: 480-60149-1 MS
Matrix: Water
Analysis Batch: 184514

Client Sample ID: MW-15-051914
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	2.2		20.0	18.21		mg/L		80	54 - 131

Lab Sample ID: 480-60149-1 MSD
Matrix: Water
Analysis Batch: 184514

Client Sample ID: MW-15-051914
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon	2.2		20.0	18.34		mg/L		81	54 - 131	1	20

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 480-183129/30
Matrix: Water
Analysis Batch: 183129

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity	ND		5.0	0.79	mg/L			05/20/14 13:05	1

Method: SM 2320B - Alkalinity (Continued)

Lab Sample ID: MB 480-183129/6
Matrix: Water
Analysis Batch: 183129

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity	1.01	J	5.0	0.79	mg/L			05/20/14 10:35	1

Lab Sample ID: LCS 480-183129/31
Matrix: Water
Analysis Batch: 183129

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Alkalinity	100	94.43		mg/L		94	90 - 110

Lab Sample ID: LCS 480-183129/7
Matrix: Water
Analysis Batch: 183129

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Alkalinity	100	94.69		mg/L		95	90 - 110

Lab Sample ID: 480-60149-1 MS
Matrix: Water
Analysis Batch: 183129

Client Sample ID: MW-15-051914
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Alkalinity	439		100	490.4	4	mg/L		51	42 - 116

Lab Sample ID: 480-60149-1 MSD
Matrix: Water
Analysis Batch: 183129

Client Sample ID: MW-15-051914
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Alkalinity	439		100	487.2	4	mg/L		48	42 - 116	1	20

Method: SM 4500 S2 D - Sulfide, Total

Lab Sample ID: MB 480-183372/27
Matrix: Water
Analysis Batch: 183372

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		0.10	0.052	mg/L			05/21/14 13:00	1

Lab Sample ID: MB 480-183372/3
Matrix: Water
Analysis Batch: 183372

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		0.10	0.052	mg/L			05/21/14 12:07	1

Method: SM 4500 S2 D - Sulfide, Total (Continued)

Lab Sample ID: LCS 480-183372/28
Matrix: Water
Analysis Batch: 183372

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfide	0.750	0.741		mg/L		99	90 - 110

Lab Sample ID: LCS 480-183372/4
Matrix: Water
Analysis Batch: 183372

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfide	0.750	0.750		mg/L		100	90 - 110

Lab Sample ID: 480-60149-1 MS
Matrix: Water
Analysis Batch: 183372

Client Sample ID: MW-15-051914
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfide	ND		0.500	0.389	F1	mg/L		78	90 - 110

Lab Sample ID: 480-60149-1 MSD
Matrix: Water
Analysis Batch: 183372

Client Sample ID: MW-15-051914
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfide	ND		0.500	0.391	F1	mg/L		78	90 - 110	1	20

GC/MS VOA

Analysis Batch: 183278

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60149-1	MW-15-051914	Total/NA	Water	8260C	
480-60149-1 MS	MW-15-051914	Total/NA	Water	8260C	
480-60149-1 MSD	MW-15-051914	Total/NA	Water	8260C	
480-60149-2	MW-12-051914	Total/NA	Water	8260C	
LCS 480-183278/5	Lab Control Sample	Total/NA	Water	8260C	
MB 480-183278/8	Method Blank	Total/NA	Water	8260C	

GC VOA

Analysis Batch: 72640

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60149-1	MW-15-051914	Total/NA	Water	RSK-175	
480-60149-1 MS	MW-15-051914	Total/NA	Water	RSK-175	
480-60149-2	MW-12-051914	Total/NA	Water	RSK-175	
LCS 200-72640/12	Lab Control Sample	Total/NA	Water	RSK-175	
MB 200-72640/13	Method Blank	Total/NA	Water	RSK-175	

Analysis Batch: 72800

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60149-1 MSD	MW-15-051914	Total/NA	Water	RSK-175	
LCS 200-72800/2	Lab Control Sample	Total/NA	Water	RSK-175	
MB 200-72800/3	Method Blank	Total/NA	Water	RSK-175	

Analysis Batch: 182966

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60149-1	MW-15-051914	Total/NA	Water	RSK-175	
480-60149-1 MS	MW-15-051914	Total/NA	Water	RSK-175	
480-60149-1 MSD	MW-15-051914	Total/NA	Water	RSK-175	
480-60149-2	MW-12-051914	Total/NA	Water	RSK-175	
480-60149-2 - DL	MW-12-051914	Total/NA	Water	RSK-175	
LCS 480-182966/4	Lab Control Sample	Total/NA	Water	RSK-175	
MB 480-182966/3	Method Blank	Total/NA	Water	RSK-175	

Analysis Batch: 185472

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60149-1	MW-15-051914	Total/NA	Water	AM20GAX	
480-60149-2	MW-12-051914	Total/NA	Water	AM20GAX	

Metals

Prep Batch: 182961

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60149-1	MW-15-051914	Total/NA	Water	3005A	
480-60149-1 MS	MW-15-051914	Total/NA	Water	3005A	
480-60149-1 MSD	MW-15-051914	Total/NA	Water	3005A	
480-60149-2	MW-12-051914	Total/NA	Water	3005A	
LCS 480-182961/2-A	Lab Control Sample	Total/NA	Water	3005A	
MB 480-182961/1-A	Method Blank	Total/NA	Water	3005A	

Metals (Continued)

Analysis Batch: 183496

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60149-1	MW-15-051914	Total/NA	Water	6010C	182961
480-60149-1 MS	MW-15-051914	Total/NA	Water	6010C	182961
480-60149-1 MSD	MW-15-051914	Total/NA	Water	6010C	182961
480-60149-2	MW-12-051914	Total/NA	Water	6010C	182961
LCS 480-182961/2-A	Lab Control Sample	Total/NA	Water	6010C	182961
MB 480-182961/1-A	Method Blank	Total/NA	Water	6010C	182961

General Chemistry

Analysis Batch: 183081

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60149-2	MW-12-051914	Total/NA	Water	300.0	
LCS 480-183081/51	Lab Control Sample	Total/NA	Water	300.0	
MB 480-183081/52	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 183103

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60149-1	MW-15-051914	Total/NA	Water	353.2	
480-60149-1 MS	MW-15-051914	Total/NA	Water	353.2	
480-60149-1 MSD	MW-15-051914	Total/NA	Water	353.2	
LCS 480-183103/4	Lab Control Sample	Total/NA	Water	353.2	
MB 480-183103/3	Method Blank	Total/NA	Water	353.2	

Analysis Batch: 183105

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60149-1	MW-15-051914	Total/NA	Water	353.2	
480-60149-2	MW-12-051914	Total/NA	Water	353.2	

Analysis Batch: 183110

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60149-2	MW-12-051914	Total/NA	Water	353.2	

Analysis Batch: 183129

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60149-1	MW-15-051914	Total/NA	Water	SM 2320B	
480-60149-1 MS	MW-15-051914	Total/NA	Water	SM 2320B	
480-60149-1 MSD	MW-15-051914	Total/NA	Water	SM 2320B	
480-60149-2	MW-12-051914	Total/NA	Water	SM 2320B	
LCS 480-183129/31	Lab Control Sample	Total/NA	Water	SM 2320B	
LCS 480-183129/7	Lab Control Sample	Total/NA	Water	SM 2320B	
MB 480-183129/30	Method Blank	Total/NA	Water	SM 2320B	
MB 480-183129/6	Method Blank	Total/NA	Water	SM 2320B	

Analysis Batch: 183353

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60149-1	MW-15-051914	Total/NA	Water	300.0	
480-60149-1 MS	MW-15-051914	Total/NA	Water	300.0	
480-60149-1 MSD	MW-15-051914	Total/NA	Water	300.0	
480-60149-2	MW-12-051914	Total/NA	Water	300.0	
LCS 480-183353/27	Lab Control Sample	Total/NA	Water	300.0	

General Chemistry (Continued)

Analysis Batch: 183353 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 480-183353/28	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 183372

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60149-1	MW-15-051914	Total/NA	Water	SM 4500 S2 D	
480-60149-1 MS	MW-15-051914	Total/NA	Water	SM 4500 S2 D	
480-60149-1 MSD	MW-15-051914	Total/NA	Water	SM 4500 S2 D	
480-60149-2	MW-12-051914	Total/NA	Water	SM 4500 S2 D	
LCS 480-183372/28	Lab Control Sample	Total/NA	Water	SM 4500 S2 D	
LCS 480-183372/4	Lab Control Sample	Total/NA	Water	SM 4500 S2 D	
MB 480-183372/27	Method Blank	Total/NA	Water	SM 4500 S2 D	
MB 480-183372/3	Method Blank	Total/NA	Water	SM 4500 S2 D	

Analysis Batch: 183566

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60149-1	MW-15-051914	Total/NA	Water	300.0	
480-60149-1 MS	MW-15-051914	Total/NA	Water	300.0	
480-60149-1 MSD	MW-15-051914	Total/NA	Water	300.0	
LCS 480-183566/3	Lab Control Sample	Total/NA	Water	300.0	
MB 480-183566/4	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 183971

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60149-1	MW-15-051914	Total/NA	Water	350.1	
480-60149-1 MS	MW-15-051914	Total/NA	Water	350.1	
480-60149-1 MSD	MW-15-051914	Total/NA	Water	350.1	
480-60149-2	MW-12-051914	Total/NA	Water	350.1	
LCS 480-183971/52	Lab Control Sample	Total/NA	Water	350.1	
LCS 480-183971/76	Lab Control Sample	Total/NA	Water	350.1	
MB 480-183971/51	Method Blank	Total/NA	Water	350.1	
MB 480-183971/75	Method Blank	Total/NA	Water	350.1	

Analysis Batch: 184059

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60149-2	MW-12-051914	Total/NA	Water	9060A	
LCS 480-184059/28	Lab Control Sample	Total/NA	Water	9060A	
LCS 480-184059/56	Lab Control Sample	Total/NA	Water	9060A	
MB 480-184059/27	Method Blank	Total/NA	Water	9060A	
MB 480-184059/55	Method Blank	Total/NA	Water	9060A	

Analysis Batch: 184514

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-60149-1	MW-15-051914	Total/NA	Water	9060A	
480-60149-1 MS	MW-15-051914	Total/NA	Water	9060A	
480-60149-1 MSD	MW-15-051914	Total/NA	Water	9060A	
LCS 480-184514/19	Lab Control Sample	Total/NA	Water	9060A	
LCS 480-184514/4	Lab Control Sample	Total/NA	Water	9060A	
MB 480-184514/18	Method Blank	Total/NA	Water	9060A	
MB 480-184514/3	Method Blank	Total/NA	Water	9060A	

Lab Chronicle

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60149-1

Client Sample ID: MW-15-051914

Lab Sample ID: 480-60149-1

Date Collected: 05/19/14 11:35

Matrix: Water

Date Received: 05/19/14 16:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	183278	05/21/14 15:31	LCH	TAL BUF
Total/NA	Analysis	AM20GAX		1	185472	05/28/14 09:45	CTB	SC0015
Total/NA	Analysis	RSK-175		1	72640	05/27/14 15:31	NEA	TAL BUR
Total/NA	Analysis	RSK-175		1	182966	05/20/14 08:55	MAN	TAL BUF
Total/NA	Prep	3005A			182961	05/20/14 08:10	EHD	TAL BUF
Total/NA	Analysis	6010C		1	183496	05/21/14 17:31	MTM2	TAL BUF
Total/NA	Analysis	300.0		10	183566	05/22/14 15:04	KRC	TAL BUF
Total/NA	Analysis	300.0		10	183353	05/21/14 20:15	KRC	TAL BUF
Total/NA	Analysis	350.1		1	183971	05/23/14 14:38	EGS	TAL BUF
Total/NA	Analysis	353.2		1	183105	05/20/14 12:42	NCH	TAL BUF
Total/NA	Analysis	353.2		1	183103	05/20/14 12:42	NCH	TAL BUF
Total/NA	Analysis	9060A		1	184514	05/26/14 20:51	KRC	TAL BUF
Total/NA	Analysis	SM 2320B		1	183129	05/20/14 13:48	VAJ	TAL BUF
Total/NA	Analysis	SM 4500 S2 D		1	183372	05/21/14 12:53	KJ1	TAL BUF

Client Sample ID: MW-12-051914

Lab Sample ID: 480-60149-2

Date Collected: 05/19/14 15:40

Matrix: Water

Date Received: 05/19/14 16:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		2	183278	05/21/14 15:55	LCH	TAL BUF
Total/NA	Analysis	AM20GAX		1	185472	05/28/14 09:59	CTB	SC0015
Total/NA	Analysis	RSK-175		1	72640	05/27/14 15:58	NEA	TAL BUR
Total/NA	Analysis	RSK-175		1	182966	05/20/14 09:28	MAN	TAL BUF
Total/NA	Analysis	RSK-175	DL	10	182966	05/20/14 09:55	MAN	TAL BUF
Total/NA	Prep	3005A			182961	05/20/14 08:10	EHD	TAL BUF
Total/NA	Analysis	6010C		1	183496	05/21/14 17:50	MTM2	TAL BUF
Total/NA	Analysis	300.0		5	183081	05/21/14 00:51	KRC	TAL BUF
Total/NA	Analysis	300.0		50	183353	05/21/14 21:06	KRC	TAL BUF
Total/NA	Analysis	350.1		1	183971	05/23/14 14:40	EGS	TAL BUF
Total/NA	Analysis	353.2		1	183105	05/20/14 10:44	NCH	TAL BUF
Total/NA	Analysis	353.2		1	183110	05/20/14 10:44	NCH	TAL BUF
Total/NA	Analysis	9060A		1	184059	05/24/14 17:01	KRC	TAL BUF
Total/NA	Analysis	SM 2320B		1	183129	05/20/14 14:24	VAJ	TAL BUF
Total/NA	Analysis	SM 4500 S2 D		1	183372	05/21/14 13:11	KJ1	TAL BUF

Laboratory References:

SC0015 = Pittsburgh, PA (formerly Microseeps), 220 William Pitt Way, Pittsburgh, PA 15238, TEL (412)826-5245

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL BUR = TestAmerica Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Certification Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60149-1

Laboratory: TestAmerica Buffalo

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0686	07-06-14
California	State Program	9	1169CA	09-30-14
Connecticut	State Program	1	PH-0568	09-30-14
Florida	NELAP	4	E87672	06-30-14
Georgia	State Program	4	N/A	03-31-15
Illinois	NELAP	5	200003	09-30-14
Iowa	State Program	7	374	03-01-15
Kansas	NELAP	7	E-10187	01-31-15
Kentucky (DW)	State Program	4	90029	12-31-14
Kentucky (UST)	State Program	4	30	03-31-15
Louisiana	NELAP	6	02031	06-30-14
Maine	State Program	1	NY00044	12-04-14
Maryland	State Program	3	294	03-31-15
Massachusetts	State Program	1	M-NY044	06-30-14
Michigan	State Program	5	9937	03-31-15
Minnesota	NELAP	5	036-999-337	12-31-14
New Hampshire	NELAP	1	2337	11-17-14
New Jersey	NELAP	2	NY455	06-30-14
New York	NELAP	2	10026	03-31-15
North Dakota	State Program	8	R-176	03-31-14 *
Oklahoma	State Program	6	9421	08-31-14
Oregon	NELAP	10	NY200003	06-09-14
Pennsylvania	NELAP	3	68-00281	07-31-14
Rhode Island	State Program	1	LAO00328	12-30-14
Tennessee	State Program	4	TN02970	03-31-15
Texas	NELAP	6	T104704412-11-2	07-31-14
USDA	Federal		P330-11-00386	11-22-14
Virginia	NELAP	3	460185	09-14-14
Washington	State Program	10	C784	02-10-15
Wisconsin	State Program	5	998310390	08-31-14

Laboratory: TestAmerica Burlington

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Connecticut	State Program	1	PH-0751	09-30-15
DE Haz. Subst. Cleanup Act (HSCA)	State Program	3	NA	02-13-15
Florida	NELAP	4	E87467	06-30-14 *
L-A-B	DoD ELAP		L2336	02-26-17
Louisiana	NELAP	6	176292	06-30-14
Maine	State Program	1	VT00008	04-17-15
Minnesota	NELAP	5	050-999-436	12-31-14
New Hampshire	NELAP	1	2006	12-18-14
New Jersey	NELAP	2	VT972	06-30-14 *
New York	NELAP	2	10391	03-31-15
Pennsylvania	NELAP	3	68-00489	04-30-15
Rhode Island	State Program	1	LAO00298	12-30-14
US Fish & Wildlife	Federal		LE-058448-0	02-28-15
USDA	Federal		P330-11-00093	10-28-16
Vermont	State Program	1	VT-4000	12-31-14

* Expired certification is currently pending renewal and is considered valid.

Certification Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60149-1

Laboratory: TestAmerica Burlington (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Virginia	NELAP	3	460209	12-14-14

Method Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60149-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	TAL BUF
AM20GAX	Dissolved Gases (GC)	NONE	SC0015
RSK-175	Dissolved Gases (GC)	RSK	TAL BUR
RSK-175	Dissolved Gases (GC)	RSK	TAL BUF
6010C	Metals (ICP)	SW846	TAL BUF
300.0	Anions, Ion Chromatography	MCAWW	TAL BUF
350.1	Nitrogen, Ammonia	MCAWW	TAL BUF
353.2	Nitrogen, Nitrite	MCAWW	TAL BUF
353.2	Nitrate	EPA	TAL BUF
9060A	Organic Carbon, Total (TOC)	SW846	TAL BUF
SM 2320B	Alkalinity	SM	TAL BUF
SM 4500 S2 D	Sulfide, Total	SM	TAL BUF

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

NONE = NONE

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

SC0015 = Pittsburgh, PA (formerly Microseeps), 220 William Pitt Way, Pittsburgh, PA 15238, TEL (412)826-5245

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL BUR = TestAmerica Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Sample Summary

Client: Conestoga-Rovers & Associates, Inc.
Project/Site: 058507, GM-Lockport Groundwater Sampling

TestAmerica Job ID: 480-60149-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-60149-1	MW-15-051914	Water	05/19/14 11:35	05/19/14 16:35
480-60149-2	MW-12-051914	Water	05/19/14 15:40	05/19/14 16:35

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

June 2, 2014

Melissa Deyo
Test America
10 Hazelwood Drive
Buffalo, NY 14228

RE: **GM-Lockport / 480-60149-1**
Microseeps Workorder: 12226

Dear Melissa Deyo:

Enclosed are the analytical results for sample(s) received by the laboratory on Wednesday, May 21, 2014. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Robbin Robl 06/02/2014
rrobl@microseeps.com

Customer Service Representative

Enclosures

As a valued client we would appreciate your comments on our service.
Please email info@microseeps.com.

Total Number of Pages 9

CERTIFICATE OF ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

LABORATORY ACCREDITATIONS & CERTIFICATIONS

Accreditor:	Pennsylvania Department of Environmental Protection, Bureau of Laboratories
Accreditation ID:	02-00538
Scope:	NELAP Non-Potable Water and Solid & Hazardous Waste
Accreditor:	NELAP: State of Florida, Department of Health, Bureau of Laboratories
Accreditation ID:	E87832
Scope:	Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)
Accreditor:	South Carolina Department of Health and Environmental Control, Office of Environmental Laboratory Certification
Accreditation ID:	89009003
Scope:	Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA)
Accreditor:	NELAP: State of Louisiana, Department of Environmental Quality
Accreditation ID:	04104
Scope:	Solid and Chemical Materials; Non-Potable Water
Accreditor:	NELAP: New Jersey, Department of Environmental Protection
Accreditation ID:	PA026
Scope:	Non-Potable Water; Solid and Chemical Materials
Accreditor:	NELAP: New York, Department of Health Wadsworth Center
Accreditation ID:	11815
Scope:	Non-Potable Water; Solid and Hazardous Waste
Accreditor:	State of Connecticut, Department of Public Health, Division of Environmental Health
Accreditation ID:	PH-0263
Scope:	Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)
Accreditor:	NELAP: Texas, Commission on Environmental Quality
Accreditation ID:	T104704453-09-TX
Scope:	Non-Potable Water
Accreditor:	State of New Hampshire
Accreditation ID:	299409
Scope:	Non-potable water
Accreditor:	State of Georgia
Accreditation ID:	Chapter 391-3-26
Scope:	As per the Georgia EPD Rules and Regulations for Commercial Laboratories, Microseeps is accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

CERTIFICATE OF ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

SAMPLE SUMMARY

Workorder: 12226 GM-Lockport / 480-60149-1

Lab ID	Sample ID	Matrix	Date Collected	Date Received
122260001	MW-15-051914(480-60149-1)	Bubble Strip	5/19/2014 11:35	5/21/2014 11:00
122260002	MW-12-051914(480-60149-2)	Bubble Strip	5/19/2014 15:40	5/21/2014 11:00

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 12226 GM-Lockport / 480-60149-1

Lab ID: **122260001** Date Received: 5/21/2014 11:00 Matrix: Bubble Strip

Sample ID: **MW-15-051914(480-60149-1)** Date Collected: 5/19/2014 11:35

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
RISK - MICR										
Analysis Desc: AM20GAX			Analytical Method: AM20GAX							
Hydrogen	**0.83**	nM	0.60	0.13	1			5/28/2014 09:45	GT	

CERTIFICATE OF ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 12226 GM-Lockport / 480-60149-1

Lab ID: **122260002** Date Received: 5/21/2014 11:00 Matrix: Bubble Strip

Sample ID: **MW-12-051914(480-60149-2)** Date Collected: 5/19/2014 15:40

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
RISK - MICR										
Analysis Desc: AM20GAX			Analytical Method: AM20GAX							
Hydrogen	**33**	nM	0.60	0.13	1			5/28/2014 09:59	GT	

CERTIFICATE OF ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS QUALIFIERS

Workorder: 12226 GM-Lockport / 480-60149-1

DEFINITIONS/QUALIFIERS

Disclaimer : The Pennsylvania Department of Environmental Protection (PADEP) has decided to no longer recognize analyses that do not produce data for primary compliance, for NELAP accreditation. The methods affected by this decision are AM20GAx, AM21G, SW846 7199 and AM4.02. The laboratory shall continue to administer the NELAP/TNI standard requirements in the performance of these methods.

MDL	Method Detection Limit. Can be used synonymously with LOD; Limit Of Detection.
PQL	Practical Quanitation Limit. Can be used synonymously with LOQ; Limit Of Quantitation.
ND	Not detected at or above reporting limit.
DF	Dilution Factor.
S	Surrogate.
RPD	Relative Percent Difference.
% Rec	Percent Recovery.
U	Indicates the compound was analyzed for, but not detected at or above the noted concentration.
J	Estimated concentration greater than the set method detection limit (MDL) and less than the set reporting limit (PQL).

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

QUALITY CONTROL DATA

Workorder: 12226 GM-Lockport / 480-60149-1

QC Batch: DISG/3800 Analysis Method: AM20GAX

QC Batch Method: AM20GAX

Associated Lab Samples: 122260001, 122260002

METHOD BLANK: 27980

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Hydrogen	nM	0.60 U	0.60	

LABORATORY CONTROL SAMPLE & LCSD: 27981 27982

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
RISK										
Hydrogen	nM	24	22	22	92	92	80-120	0	20	

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

Microseeps/Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 12226 GM-Lockport / 480-60149-1

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
122260001	MW-15-051914(480-60149-1)			AM20GAX	DISG/3800
122260002	MW-12-051914(480-60149-2)			AM20GAX	DISG/3800

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Microseeps/Pace Analytical Energy Services, LLC.

TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

12226

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Deyo, Melissa L	Carrier Tracking No(s):	COC No: 480-16470.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: melissa.deyo@testamericainc.com		Page: Page 1 of 1
Company: Pace Analytical Services, Inc.				Job #: 480-60149-1
Address: 220 William Pitt Way,	Due Date Requested: 5/30/2014			
City: Pittsburgh	TAT Requested (days):			
State, Zip: PA, 15238				
Phone: 412-826-5245(Tel)	PO #:			
Email:	WO #:			
Project Name: 058507, GM-Lockport Groundwater Sampling	Project #: 48004014			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	AM20GAX/ Hydrogen	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
MW-15-051914 (480-60149-1)	5/19/14	11:35 Eastern		Water			X	1	
MW-12-051914 (480-60149-2)	5/19/14	15:40 Eastern		Water			X	1	

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	Cameron Wallace	5-20-14 1100	TABuff		5.21.14 1100	PAES
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ∆ Yes ∆ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

6/3/2014

TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

480-60149 Chain of Custody

Client Information	Sampler: T. Bohlen
Client Contact: Mr. Tom Bohlen	Phone: 716 685-2300
Company: GZA GeoEnvironmental, Inc.	
Address: 535 Washington Street 11th Floor	Due Date Requested:
City: Buffalo	TAT Requested (days):
State, Zip: NY, 14203	
Phone:	PO #: 4062165
Email: thomas.bohlen@gza.com	WO #: 58507
Project Name: 058507, GM-Lockport Groundwater Sampling	Project #: 48004014
Site:	SSOW#:

...g No(s):

COC No: 480-49375-13138.4
Page: Page 4 of 4
Job #:

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	RSK_175_CO2 - Carbon dioxide	350.1 - Ammonia	6010B - Metals - Fe, Mn, Mg	8260B - PCE, TCE, DCE (trans and cis), Vinyl Chl	9060 - Total Organic Carbon	RSK_175 - Methane, Ethane, Ethene	SM4500_S2_D - Sulfide	353.2, 353.2_Nitrite, Nitrate_Calc	2320B - Total Alkalinity	300.0_28D - Anions (Chloride & Sulfate)	AM 20GAX	Total Number of containers	Special Instructions/Note:
				Preservation Code:			N	S	D	A	A	A	CB	N	N	N			
MW-15-~~051614~~ 051914 MS/MSD	~~5/16/14~~	1135	G	Water	N	Y	X	X	X	X	X	X	X	X	X	X	X		*Dissolved H2
MW-12-~~051614~~ 051914	~~5/16/14~~ 5/19/14	1540	G	Water	N	N	X	X	X	X	X	X	X	X	X	X	X		for Microseeps*
				Water															
				Water															
				Water															
				Water															

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Thomas Bohlen	5/19/14 16:35		[signature]	5/19/14 16:35	TA Buff
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: #1 3.6

6/3/2014

Login Sample Receipt Checklist

Client: Conestoga-Rovers & Associates, Inc.

Job Number: 480-60149-1

Login Number: 60149

List Source: TestAmerica Buffalo

List Number: 1

Creator: Wienke, Robert K

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	N/A	
Chlorine Residual checked.	N/A	

Login Sample Receipt Checklist

Client: Conestoga-Rovers & Associates, Inc.

Job Number: 480-60149-1

Login Number: 60149
List Number: 2
Creator: Gagne, Eric M

List Source: TestAmerica Burlington
List Creation: 05/22/14 12:10 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	877415
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	2.6ºC. IR GUN ID 181. CF = 0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	No sample times listed on container labels
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

10515 Research Drive
Knoxville, TN 37932
Phone: 865.573.8188
Fax: 865.573.8133
Web: www.microbe.com

SITE LOGIC Report

Bio-Trap In Situ Microcosm Study

Contact: Karen Kinsella
Address: GZA GeoEnvironmental, Inc.
655 Winding Brook Dr., Suite 402
Glastonbury, CT 06033

Phone: (860) 858-3107

Email: Karen.Kinsella@gza.com

MI Identifier: 013LI

Report Date: September 26, 2014

Project: GMCH Lockport, 21.0056546.00 Task 24

Comments:

NOTICE: This report is intended only for the addressee shown above and may contain confidential or privileged information. If the recipient of this material is not the intended recipient or if you have received this in error, please notify Microbial Insights, Inc. immediately. The data and other information in this report represent only the sample(s) analyzed and are rendered upon condition that it is not to be reproduced without approval from Microbial Insights, Inc. Thank you for your cooperation.

Executive Summary

A Bio-Trap® *In Situ* Microcosm (ISM) study was performed in monitoring wells MW-7 and MW-4 to investigate whether the addition of a lactose/yeast blend would stimulate biodegradation of tetrachloroethene (PCE), trichloroethene (TCE), and associated daughter compounds. The ISM assemblies deployed in the two wells consisted of two units each: the MNA unit contained no exogenous amendment, thus simulating MNA conditions, and the BioStim unit was amended with a powdered lactose/yeast blend supplied by GZA. The ISM assemblies were recovered after a 91-day incubation period for CENSUS® analysis of dechlorinating bacteria and quantification of contaminant concentrations, dissolved gases, volatile fatty acids (VFAs), and anions. Summaries of the results are provided in Table 1 and Figures 1 and 2. Following are key observations from the results obtained from each *in situ* microcosm.

MW-7

- In the MNA unit, *Dehalococcoides* (10^2 cells/bead) and vinyl chloride reductase genes (10^2 copies/bead) were detected, indicating the presence of bacterial populations capable of complete reductive dechlorination of TCE to ethene.
- The concentration of *Dehalococcoides* in the BioStim unit was also low and comparable to those detected in the MNA unit. However, vinyl chloride reductase genes were below the detection limit.
- The *Dehalococcoides* populations in both units were below the 10^4 cells/mL proposed by Lu et al (2006) as a threshold concentration needed for a generally effective rate of reductive dechlorination.
- Although DCE, vinyl chloride, and ethene daughter products were detected in both the MNA and BioStim units, TCE was the contaminant present in the highest concentration. These results are consistent with CENSUS results revealing low populations of halorespiring bacteria.
- The methane concentration in the BioStim unit (54 μg/L) was similar to that in the MNA unit (74 μg/L), and VFAs were not detected in either unit.
- *Dehalococcoides* and contaminant concentrations in the BioStim unit were comparable to those detected in the MNA unit, suggesting that the lactose/yeast blend did not substantially enhance growth of halorespiring bacteria and increase reductive dechlorination within the deployment period

MW-4

- High concentrations of *Dehalococcoides* (10^5 cells/bd) and BVC and VCR vinyl chloride reductase genes (10^5 copies/bead and 10^2 copies/bead, respectively) were detected in the MNA unit indicating the potential for complete reductive dechlorination of TCE to ethene under existing conditions.
- Consistent with the CENSUS results, cis-DCE (39,800 μg/L) was the predominant contaminant, and vinyl chloride (4,810 μg/L) and ethene (700 μg/L) daughter products were also present in the MNA unit.
- The *Dehalococcoides* concentration in the BioStim unit was an order of magnitude higher compared to the MNA unit. Vinyl chloride reductase genes were higher in the BioStim unit compared to MNA levels, suggesting that the lactose/yeast blend enhanced halorespiring bacteria.
- The contaminant results from the BioStim Unit were very similar to those from the MNA unit. The primary contaminant was cis-DCE (37,900 μg/L), and substantial concentrations of vinyl chloride (3,420 μg/L) and ethene (700 μg/L) were also detected.
- While the methane concentration was only slightly higher in BioStim unit compared to MNA unit, the concentrations in both units were 2 orders of magnitude higher than in the units deployed in MW-7. The higher methane concentrations in MW-4 also correlated with higher concentrations of *Dehalococcoides* and increased degradation of chlorinated ethenes compared to MW-7.

10515 Research Drive
Knoxville, TN 37932
Phone: 865.573.8188
Fax: 865.573.8133
www.microbe.com

- Overall, the results from the MNA unit indicated that environmental conditions under current conditions were conducive to reductive dechlorination. With the addition of the lactose/yeast blend, concentrations of *Dehalococcoides* and vinyl chloride reductase genes did increase, but contaminant concentrations and geochemistry were not substantially different from those in the MNA unit.

10515 Research Drive
Knoxville, TN 37932
Phone: 865.573.8188
Fax: 865.573.8133
www.microbe.com

Overview of Approach

Site managers have frequently turned to laboratory microcosms or small pilot studies to evaluate bioremediation. However, duplication of *in situ* conditions in the laboratory is difficult and the results often do not correlate to the field. Pilot studies are performed in the field but are often prohibitively expensive as an investigative tool. Bio-Trap studies serve as cost-effective, *in situ* microcosms providing microbial, chemical, and geochemical evidence to evaluate biodegradation as a treatment mechanism and to screen remedial alternatives.

Typically each Bio-Trap Unit will contain samplers to evaluate the following:

Geochemical Fingerprint (GEO)	•20 mL amber VOA vial with a nylon screened cap designed for assessment of a variety of geochemical parameters including anions and metabolic acids.
Contaminant of Concern (COC)	•40 mL amber VOA vial with a low density polyethylene (LDPE) seal designed for analysis of a variety of COCs including chlorinated solvents and petroleum hydrocarbons.
Microbial Populations (MICRO)	•PVC cassette containing Bio-Sep beads which provide a large surface area for microbial attachment and were designed for analysis by a variety of molecular biological tools (MBTs).

How does it work?

The MICRO sampler (microbial populations) contains Bio-Sep® beads, an engineered composite of Nomex® and powdered activated carbon which provides an incredibly large surface area (~600 m^2/g) that is readily colonized by subsurface microorganisms. In addition to a matrix for microbial growth, the Bio-Sep® beads can be "baited" with amendments including electron donors (e.g. hydrogen releasing compounds) to investigate biostimulation approaches to enhance biodegradation. The Bio-Trap units also contain a COC (contaminant of concern) sampler to measure contaminant concentrations, daughter product formation, and dissolved gases and a GEO (geochemical fingerprint) sampler for quantification of geochemical parameters (nitrate, iron, sulfate, etc.), chloride production and metabolic acids (pyruvic, lactic, acetic, propionic, etc.).

10515 Research Drive
Knoxville, TN 37932
Phone: 865.573.8188
Fax: 865.573.8133
www.microbe.com

Bio-Trap® *In Situ* Microcosm studies at chlorinated solvent sites typically include three types of Bio-Trap Units deployed within a monitoring well. Each Bio-Trap Unit corresponds to one of the three most common remedial options: monitored natural attenuation (MNA), Biostimulation (BioStim), and Bioaugmentation (BioAug). All three Bio-Trap Units contain COC and GEO samplers for chemical and geochemical analyses. The key difference between the Bio-Trap Units is in the MICRO sampler.

Types of Bio-Trap Units typically deployed and MICRO sampler configurations:

Control (MNA)	•Bio-Sep® beads contain no additional electron donor and represent current aquifer conditions.
Biostimulation (BioStim)	•Bio-Sep® beads are baited with a specified electron donor (sodium lactate, EOS, HRC, molasses, etc) or an Amendment Supplier is used to release the desired amendment.
Bioaugmentation (BioAug)	•Bio-Sep® beads are pre-inoculated with a *Dehalococcoides* culture. These units can also be baited with an additional electron donor.

MNA Unit: The purpose of the Control Bio-Trap Unit is to quantify contaminant degrading bacteria and daughter product formation under monitored natural attenuation (MNA) conditions and to serve as a baseline for comparison to BioStim and/or BioAug Units.

Following in-well deployment, DNA or phospholipid fatty acids can be extracted from the Bio-Sep beads for CENSUS or PLFA analyses. For example, DNA extracted from the Bio-Sep beads can be used in CENSUS analysis of *Dehalococcoides* (qDHC) and vinyl chloride reductase (qVC) genes to evaluate the potential for complete reductive dechlorination of PCE to ethene under MNA conditions. The VOC and anion samplers can be used to determine concentrations of contaminants, daughter products, dissolved gases, terminal electron acceptors, and chloride.

BioStim Unit: The Biostimulation Bio-Trap Unit is designed to test the hypothesis that electron donor addition will stimulate growth of dechlorinating bacteria and enhance biodegradation. As with the MNA Unit, the BioStim Unit contains COC and GEO samplers for chemical analyses. The BioStim Unit may contain either a MICRO sampler that contains Bio-Sep beads "baited" with the specified electron donor or an amendment supplier to release the desired amendment over the incubation time. If an Amendment Supplier is used the MICRO sampler will contain standard Bio-Sep beads for the growth matrix.

BioAug Unit: The Bioaugmentation Bio-Trap Unit is designed to evaluate bioaugmentation as a treatment technology. The MICRO sampler contains Bio-Sep beads pre-inoculated with the desired commercial culture and also contains an electron donor of choice. As with the MNA and BioStim Units, the BioAug Unit also contains a COC and GEO samplers for chemical analyses.

10515 Research Drive
Knoxville, TN 37932
Phone: 865.573.8188
Fax: 865.573.8133
www.microbe.com

Results

Table 1. Summary of the results obtained for *In Situ* Microcosm Units.

Sample Information Treatment	MW-7 MNA	MW-7 BioStim	MW-4 MNA	MW-4 BioStim
Microbial Populations (cells/bead)				
Dehalococcoides spp. (DHC)	5.90E+02	3.77E+02	8.10E+05	2.38E+06
tceA Reductase (TCE)	1.48E+01 (J)	2.77E+01	6.98E+03	6.52E+03
bvcA Reductase (BVC)	1.76E+02	<2.50E+01	4.06E+05	9.43E+05
vcrA Reductase (VCR)	<2.50E+01	<2.50E+01	5.95E+02	1.30E+03
Contaminant of Concern (µg/L)				
Tetrachloroethene	45.3	39.6	<10	<10
Trichloroethene	205,000	168,000	155	66.3
cis-1,2-Dichloroethene	42,900	35,100	39,800	37,900
trans-1,2-Dichloroethene	279	110	132	149
1,1-Dichloroethene	282	238	92	102
Vinyl chloride	2,200	1,800	4,810	3,420
Dissolved Gases (µg/L)				
Ethene	270	220	700	700
Ethane	33	23	91	93
Methane	74	54	1600	1800
VFAs (mg/L)				
Lactic Acid	<25	<25	<25	<25
Acetic Acid	<5.0	<5.0	<5.0	12
Propionic Acid	<5.0	<5.0	<5.0	<5.0
Butyric Acid	<5.0	<5.0	<5.0	<5.0
Pyruvic Acid	<10	<10	<10	<10
Anions (mg/L)				
Nitrate	<0.50	0.15 (J)	1.3	1.3
Nitrite	<0.50	<12	<12	<12
Ortho Phosphate	0.47 (J)	2.5	<1.5	<1.5
Sulfate	160	160	520	500
Chloride	340	330	4700	4600

Legend: J = estimated concentration below PQL but above LQL

10515 Research Drive
Knoxville, TN 37932
Phone: 865.573.8188
Fax: 865.573.8133
www.microbe.com

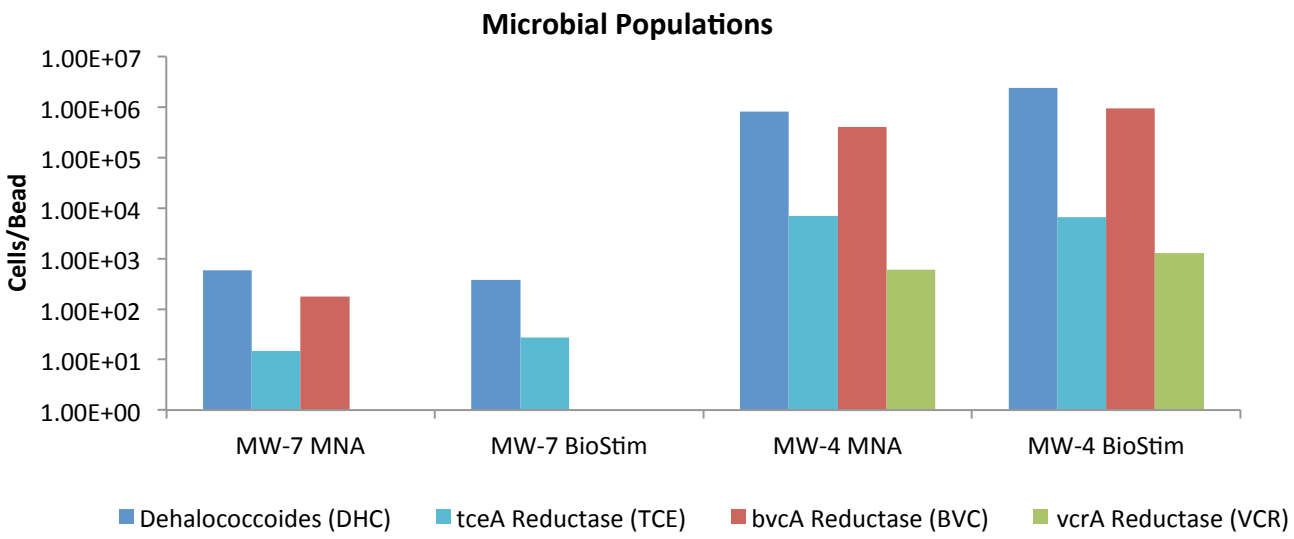


Figure 1. CENSUS® results for selected microbial populations (cells/bead).

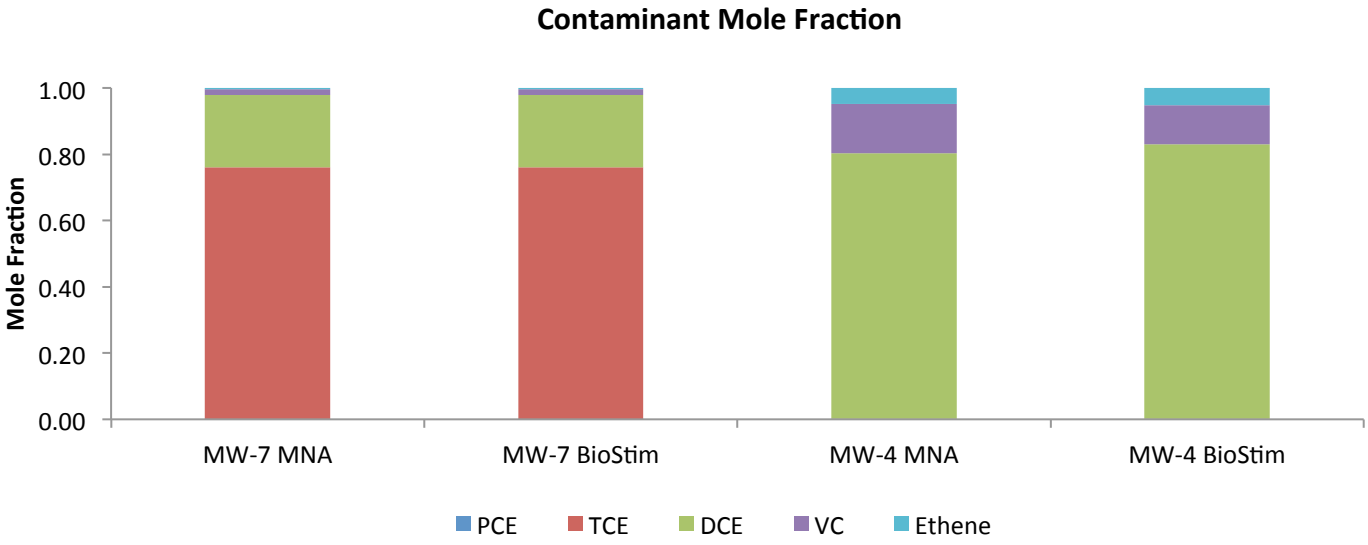


Figure 2. Contaminant mole fractions from the MNA and BioStim units deployed in MW-7 and MW-4.

10515 Research Drive
Knoxville, TN 37932
Phone: 865.573.8188
Fax: 865.573.8133
www.microbe.com

Interpretation

Bio-Trap® *In Situ* Microcosm studies are designed to provide the chemical, geochemical, and microbiological lines of evidence required to evaluate remediation options in a single, cost-effective field study. To aid in the decision making process, comparisons should generally focus on differences in results between *In Situ* Microcosm units. For example, comparison of the *Dehalococcoides* populations in the Control and BioStim units can be used to assess whether electron donor addition would stimulate growth of this key group of halorespiring bacteria. While results for individual analyses should be compared between units, overall interpretation should integrate all lines of evidence with due consideration of site conditions, site activities, and the desired treatment mechanism. The following discussion describes interpretation of results in general terms and is meant to serve as a guide.

Microbial Populations: CENSUS® analysis allows site managers to quantify targeted members of the microbial community deemed critical for site remediation. Total Eubacteria provides an index of the total bacterial biomass and is generally greater than 10^6 cells/bead in the absence of factors inhibiting microbial growth. While a number of bacterial cultures capable of utilizing PCE and TCE as growth supporting electron acceptors have been isolated[1-5], *Dehalococcoides* spp. may be the most important because they are the only bacterial group that has been isolated to date which is capable of complete reductive dechlorination of PCE to ethene[6]. In fact, the presence of *Dehalococcoides* spp. has been associated with the full dechlorination to ethene at sites across North America and Europe[7]. Thus, CENSUS® quantification of *Dehalococcoides* in each Bio-Trap *In Situ* Microcosm unit can be used to evaluate the likelihood of complete reductive dechlorination of PCE and TCE under MNA conditions, the ability of electron donor addition alone to stimulate growth of halorespiring bacteria (BioStim), and the survival of commercial *Dehalococcoides* cultures in the field (BioAug). The accumulation of the daughter products *cis*-DCE and vinyl chloride termed "DCE stall" is relatively common at PCE/TCE sites especially under MNA conditions. Accumulation of vinyl chloride, generally considered more carcinogenic than the parent compounds, is particularly problematic. CENSUS® quantification of vinyl chloride reductase genes (*bvc*A and *vcr*A) was developed to more definitively confirm the potential for biodegradation of vinyl chloride. Again, comparison of vinyl chloride reductase copies between units can be used to assess the efficacy of enhanced bioremediation approaches (biostimulation and bioaugmentation) to enhance populations of organisms specifically capable of reductive dechlorination of vinyl chloride.

Biomass Concentrations: PLFA analysis is one of the most reliable and accurate methods available for the determination of viable (live) biomass. Phospholipids break down rapidly upon cell death, so biomass calculations based on PLFA content do not include "fossil" lipids from dead cells. Total biomass (cells/bead) is calculated from total PLFA using a conversion factor of 20,000 cells/pmole of PLFA. When making comparisons between wells, treatments, or over time, differences of one order of magnitude or more are considered significant.

Total Biomass		
Low	**Moderate**	**High**
10^3 to 10^4 cells	10^5 to 10^6 cells	10^7 to 10^8 cells

Community Structure (% total PLFA): Community structure data is presented as a percentage of PLFA structural groups normalized to the total PLFA biomass. The relative proportions of the PLFA structural groups provide a "fingerprint" of the types of microbial groups (e.g. anaerobes, sulfate reducers, etc.) present and therefore offer insight into the dominant metabolic processes occurring at the sample location. Thorough interpretation of the PLFA structural groups depends in part on an understanding of site conditions and the desired microbial biodegradation pathways. For example, an increase in mid chain branched saturated PLFA (MidBrSats), indicative of sulfate reducing bacteria (SRB) and Actinomycetes, may be desirable at a site where anaerobic BTEX biodegradation is the treatment mechanism, but would not be desirable for a corrective action promoting aerobic BTEX or MTBE

10515 Research Drive
Knoxville, TN 37932
Phone: 865.573.8188
Fax: 865.573.8133
www.microbe.com

biodegradation. The following table provides a brief summary of each PLFA structural group and its potential relevance to bioremediation.

Table 3. Description of PLFA structural groups.

PLFA Structural Group	General classification	Potential Relevance to Bioremediation Studies
Monoenoic (Monos)	Abundant in Proteobacteria (Gram negative bacteria), typically fast growing, utilize many carbon sources, and adapt quickly to a variety of environments.	Proteobacteria is one of the largest groups of bacteria and represents a wide variety of both aerobes and anaerobes. The majority of Hydrocarbon utilizing bacteria fall within the Proteobacteria.
Terminally Branched Saturated (TerBrSats)	Characteristic of Firmicutes (Low G+C Gram-positive bacteria), and also found in *Bacteriodes*, and some Gram-negative bacteria (especially anaerobes).	Firmicutes are indicative of presence of anaerobic fermenting bacteria (mainly *Clostridia/Bacteriodes*-like), which produce the H_2 necessary for reductive dechlorination.
Branched Monoenoic (BrMonos)	Found in the cell membranes of micro-aerophiles and anaerobes, such as sulfate- or iron-reducing bacteria.	In contaminated environments high proportions are often associated with anaerobic sulfate and iron reducing bacteria.
Mid-Chain Branched Saturated (MidBrSats)	Common in sulfate reducing bacteria and also Actinobacteria (High G+C Gram-positive bacteria).	In contaminated environments high proportions are often associated with anaerobic sulfate and iron reducing bacteria.
Normal Saturated (Nsats)	Found in all organisms.	High proportions often indicate less diverse populations.
Polyenoic	Found in higher plants and animals.	Eukaryotic scavengers will often prey on contaminant utilizing bacteria.

Physiological Status (Proteobacteria): Some Proteobacteria modify specific PLFA as a strategy to adapt to stressful environmental conditions (3, 4). For example, *cis* monounsaturated fatty acids may be modified to cyclopropyl fatty acids during periods of slowed growth or modified to *trans* monounsaturated fatty acids to decrease membrane permeability in response to environmental stress. The ratio of product to substrate fatty acid thus provides an index of their health and metabolic activity. In general, status ratios greater than 0.25 indicate a response to unfavorable environmental conditions.

Dissolved Gases: When comparing concentrations of dissolved gases between *In Situ* Microcosm units, particular care should be afforded to the dissolved ethene concentration. While ethene can volatilize, can be further metabolized, or be further reduced to ethane in some environments, greater concentrations of ethene generally indicate complete reductive dechlorination of PCE and TCE. In addition to quantifying the end products of reductive dechlorination, analysis of dissolved gases includes determination of dissolved methane. Combined with results of geochemical analysis (See Anions), elevated methane concentrations are indicative of highly reducing conditions conducive to reductive dechlorination. However, methanogens also compete with dechlorinating bacteria including *Dehalococcoides* for available hydrogen.

10515 Research Drive
Knoxville, TN 37932
Phone: 865.573.8188
Fax: 865.573.8133
www.microbe.com

Glossary

Amendment Supplier: a component that fits inside the MICRO-Trac/Bio-Trap unit at the bottom. This component is designed to slowly diffuse a desired amendment within a BioStim and/or a BioAug Unit during the incubation time.

Sampler: Individual components consisting either of a geochemical (GEO), contaminant of concern (COC) or microbial (MICRO) sampler. Geochemical samplers are essentially VOA vials with special septa that facilitate transfer. The microbial samplers are made from a smaller PVC pipe ~1" x 3 ½" and contains Bio-Sep® beads which serve as a microbial growth matrix.

> **COC Sampler:** 40 mL amber VOA with a low density polyethylene membrane permitting passive diffusion of volatile organic compounds (VOCs).
>
> **GEO Sampler:** a 20 mL amber VOA with a nylon based membrane permitting passive diffusion of anionic species.
>
> **MICRO Sampler:** a polyvinylchloride cassette containing Bio-Sep® beads which provide a large surface area for microbial growth. In addition to a matrix for microbial growth, the Bio-Sep® beads can be "baited" with amendments including ^{13}C labeled chlorobenzene as used in this study. Bio-Sep® beads were designed to allow extraction of phospholipids fatty acids and DNA for analysis of microbial communities.

Unit: 1.25" x 15" PVC housing that all of the samplers are place into for deployment. Units will have baffled end caps to separate different zones within the monitoring well. Typically each unit will correspond to a treatment approach.

Assembly: Collections of Units for a particular monitoring well. Samplers (GEO, COC, and MICRO) are placed in each unit. Units are linked to form an Assembly. An entire Assembly (consisting of multiple units) is deployed in each well.

CENSUS: CENSUS is based on a technique called quantitative polymerase chain reaction (qPCR) whereby many copies of a specific gene are generated. As each gene copy is made, a fluorescent marker is released, measured, and used to quantify the number of target genes present in a sample.

10515 Research Drive
Knoxville, TN 37932
Phone: 865.573.8188
Fax: 865.573.8133
www.microbe.com

References

1. Gerritse, J., V. Renard, T. M. Pedro Gomes, P. A. Lawson, M. D. Collins, and J. C. Gottschal. 1996. "*Desulfitobacterium* sp. Strain PCE1, an anaerobic bacterium that can grow by reductive dechlorination of tetrachloroethene or ortho-chlorinated phenols." Archives of Microbiology 165(2): 132-140.

2. Gerritse, J., O. Drzyzga, G. Kloetstra, M. Keijmel, L. P. Wiersum, R. Hutson, M. D. Collins, and J. C. Gottschal. 1999. "Influence of different electron donors and acceptors on dehalorespiration of tetrachloroethene by *Desulfitobacterium frappieri* TCE1." Applied and Environmental Microbiology 65(12): 5212-5221.

3. Holliger, C., G. Schraa, A.J.M. Stams, and A.J.B. Zehnder. 1993. "A highly purified enrichment culture couples the reductive dechlorination of tetrachloroethene to growth." Applied and Environmental Microbiology 59 (9): 2991-2997.

4. Krumholz, L. R., R. Sharp, and S. S. Fishbain. 1996. "A freshwater anaerobe coupling acetate oxidation to tetrachloroethylene dehalogenation." Applied and Environmental Microbiology 62(11): 4108-4113.

5. Löffler, F.E., R.A. Sanford, and J.M. Tiedje. 1996. "Initial characterization of a reductive dehalogenase from *Desulfitobacterium chlororespirans* Co23." Applied and Environmental Microbiology 62(10): 3809–3813.

6. Maymó-Gatell, X., T. Anguish, and S.H. Zinder. 1999. "Reductive dechlorination of chlorinated ethenes and 1,2-dichloroethane by *Dehalococcoides ethenogenes* 195." Applied and Environmental Microbiology 65(7): 3108–3113.

7. Hendrickson, E.R., J. Payne, R.M. Young, M.G. Starr, M.P. Perry, S. Fahnestock, D.E. Ellis, and R.C. Eversole. 2002. "Molecular analysis of *Dehalococcoides* 16S ribosomal DNA from chloroethene-contaminated sites throughout North America and Europe." Applied and Environmental Microbiology 68(2): 485-495.

8. Maymo-Gatell, X. 1997. "*Dehalococcoides ethenogenes* Strain 195, A novel eubacterium that reductively dechlorinates tetrachloroethene (PCE) to ethene." Report No. AL/EQ-TR-1997-0029.

9. Gerritse et al. 1999. "Influence of different electron donors and acceptors on dehalorespiration of tetrachloroethene by *Desulfitobacterium frappieri* TCE1." Applied and Environmental Microbiology 65(12): 5212-5221.

10. Suyama et al. 2001. "Isolation and characterization of *Desulfitobacterium* sp. strain Y51 capable of efficient dehalogenation of tetrachlorethene and polychloroethanes." Bioscience Biotechnology and Biochemistry 65(7): 1474-1481.

10515 Research Drive
Knoxville, TN 37932
Phone: 865.573.8188
Fax: 865.573.8133
www.microbe.com