HALEY ALDRICH

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REPORT ON
SEMIANNUAL PROGRESS REPORT FORMER GENERAL TIME FACILITY ATHENS, GEORGIA

by Haley & Aldrich, Inc.
Greenville, South Carolina

for Carpenter Technology Corporation
Reading, Pennsylvania

File No. 128752-003
April 2017

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13 April 2017
File No. 128752-003

Georgia Environmental Protection Division
Response and Remediation Program; Release Notification Unit
2 Martin Luther King Jr. Drive, SE
Suite 1462 East
Atlanta, Georgia 30334

Attention: Allan C. Nix, P.G.

Subject: April 2017 Semi-Annual Progress Report #6
Former General Time Facility
100 Newton Bridge Road- Athens, Georgia
HSI Site Number 10355

Dear Mr. Nix:

Carpenter Technology Corporation (CTC) was accepted into the Georgia Voluntary Remediation Program (VRP) in April 2014, HSI site number 10355. Consistent with the VRP, CTC has submitted Semi-annual Progress Reports to the Georgia Environmental Protection Division (EPD) describing activities that have been conducted during the prior six months. This report is the sixth progress report being submitted since being accepted into the VRP.

As a condition of approval, the EPD requested that CTC conduct routine groundwater and surface water sampling events. The results of this sampling effort, which are contained in this report, continue to corroborate the conceptual site model (CSM), as well as to document stable or contracting groundwater plume(s) on and off the property, no unacceptable off-site vapor intrusion risks, and no adverse effects to potential ecological or human receptors in the North Oconee River. As indicated in previous progress reports, CTC continues to evaluate Enhanced In-Situ Bioremediation (EISB) as a remediation technology to address affected groundwater beneath the former manufacturing building.

If you have any questions or need additional information, please contact Sean McGowan at 610.334.2701 or me at 864.214.8751.

Sincerely yours,
HALEY & ALDRICH, INC.

Mark Miesfeldt
Project Manager

Jeffrey A. Klaiber, P.E.
Principal Consultant
Georgia Registration No. PE019857

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PROFESSIONAL ENGINEER CERTIFICATION

I certify under penalty of law that this report and all attachments were prepared by me or under my direct supervision in accordance with the Voluntary Remediation Program Act (O.C.G.A. Section 12-8-101, et seq.). I am a professional engineer who is registered with the Georgia State Board of Registration for Professional Engineers and Land Surveyors and I have the necessary experience and am in charge of the investigation and remediation of this release of regulated substances.

The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

4/13/17

Jeffrey A. Klaiber, P.E.
Principal Consultant
Georgia Registration No. PE019857

Date

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1. Introduction

The Site is located in an industrial park at 100 Newtown Bridge Road, in Athens, Georgia as shown on Figure 1. The Site is approximately 35 acres with a 325,000-square foot manufacturing building. Additional structures include outbuildings constructed of corrugated metal with concrete slab bases and a security building at the rear of the facility. The topography of the Site slopes gently from northwest to southeast.

The Former General Time facility was accepted into the Georgia Voluntary Remediation Program (VRP) in April 2014, HSI site number 10355.

2. Activities Conducted During Previous Six Months

The following activities were conducted at the Site since the submittal of Semi-Annual Progress Report #5 in October 2016:

- Haley and Aldrich collected groundwater samples in March 2017. Groundwater samples were collected on and off the site to document current conditions and corroborate the Conceptual Site Model (CSM).

- Performance (post injection) groundwater samples were collected in December 2016, January 2017, and March 2017 to monitor the effectiveness of the lactate injections and document the continued degradation of Site contaminants of concern (COCs).

- CTC continued to evaluate Enhanced In-Situ Bioremediation (EISB) as a remediation technology to address affected groundwater beneath the former manufacturing building.

- In response to EPD comment #2 in the August 23, 2016, Supplemental Comments on Revised VRP Application, EPD was present during the collection of the surface water samples from the North Oconee River on October 19th, 2016.

- A Rapid Bioassessment of the groundwater-surface water transitional zone, the riparian zone and surface water in the vicinity of the MW-11 well cluster was performed to address EPD comment #3 in the August 23, 2016, Supplemental Comments on Revised VRP Application.

3. Groundwater Monitoring Activities

This section of the report includes a summary of the groundwater monitoring activities conducted during March 2017 as well as the corresponding analytical results, field parameters, water elevations, and groundwater flow information. A Site map, which includes sampling locations, is provided as Figure 2.

Groundwater samples were collected between March 6th and March 10th, 2017. In addition to the field indicator parameters (pH, temperature, specific conductivity, dissolved oxygen, oxidation reduction potential, and turbidity) the samples were analyzed in the laboratory for the site-specific COCs. Performance sampling points installed in the vicinity of the bioremediation pilot treatment area (MP-3, MP-7, MP-8, MW-16I and MW-16D) were also monitored for the same suite of analyses plus ethane, ethene, methane, sulfate, total organic carbon (TOC), ferrous iron and volatile fatty acids (VFAs) listed in Table I.

Consistent with the previous site-wide monitoring event, groundwater samples were collected from wells constructed on and off the Site. All the wells included in the 2016 sampling event were located, confirmed to be in good repair, and sampled. Analytical results are provided in Table II and laboratory reports are provided in Appendix A.

During the sampling event the depth to groundwater was measured in each well. This information was used to calculate horizontal and vertical groundwater gradients, construct potentiometric surface maps, and assess groundwater flow direction and rate. Groundwater field sampling forms are provided in Appendix B. Laboratory reports including 1,1-DCE are included in Appendix A.

3.1 SUMMARY OF GROUNDWATER FLOW

The depth to groundwater was measured in the available wells both on- and off-Site during this sampling event. The water table elevations were subsequently calculated using the surveyed well casing elevations and the measured depth to groundwater. These data are summarized in Table III.

The March 2017 groundwater elevations from intermediate wells were used to construct the potentiometric surface shown on Figure 3. Consistent with previous interpretations, the potentiometric surface shows the groundwater flow direction is east towards the North Oconee River. The average horizontal hydraulic gradient is approximately 0.008 feet/foot, also consistent with previous interpretations. The estimated groundwater flow velocity, utilizing the average hydraulic conductivity of the intermediate zone of 5.2 feet/day and an effective porosity of 25 percent, is approximately 0.17 feet/day or 60 feet/year.

3.2 SUMMARY OF ESTIMATED VERTICAL GROUNDWATER GRADIENTS

Vertical groundwater gradients were calculated, where possible, using the March 2017 water elevation data. Consistent with previous calculations, there is a low magnitude downward flow potential in the upland area of the Site in the vicinity of the MW-2 and MW-16 well pairs. The March 2017 water elevation data indicates a downward vertical gradient in the vicinity of MW-9 cluster, reversed from the September 2016 timeframe. In the proximity to the North Oconee River, the vertical gradients in the unconsolidated overburden from the March 2017 data indicates a neutral flow potential in the vicinity

of the MW-11 well cluster. There remains a slightly positive, or upward, flow potential between the saprolite and the bedrock units. The calculated vertical gradients are provided in the table below.

Well Pair	Estimated Vertical Gradient*
MW-2S & MW-2I	-0.0135 feet/feet
MW-2I & MW-2D	-0.0402 feet/feet
MW-9I & MW-9D	-0.0321 feet/feet
MW-11S & MW-11I	0.0000 feet/feet
MW-11I & MW-11D	0.0014 feet/feet
MW-16I & MW-16D	-0.0004 feet/feet

Negative gradient indicates downward groundwater flow potential

* Results were calculated using the EPA's vertical gradient calculator

* The estimated vertical gradient was calculated at the mid-point of the screen

3.3 SUMMARY OF GROUNDWATER MONITORING RESULTS

As indicated in the approved VRP application, the only potentially completed exposure pathways to site COCs are vapor intrusion into indoor air on-site and discharge of affected groundwater to the North Oconee River. Because the on-site building is unoccupied and could not be re-occupied without significant improvements to the roof, the vapor intrusion pathway on-site is deemed incomplete. Potential vapor intrusion at off-site properties was evaluated using the Johnson & Ettinger (J&E) groundwater to indoor air model. These results were presented in the June 2015 Semiannual Progress Report. While EPD's calculated thresholds differed, EPD agrees that off-site groundwater concentrations are significantly lower than the values calculated using J&E regardless of sampling interval; therefore, the vapor intrusion risk at off-site downgradient properties is negligible. As a result, the only potential exposure pathway to Site-related groundwater contamination is discharge of groundwater to surface water at the North Oconee River, with subsequent exposure to the surface water by aquatic organisms. To date site COCs have not been detected in surface water. Distribution of TCE in shallow and intermediate groundwater is provided on Figures 4 and 5. As requested, backup for the calculated risk reduction standards was provided in the October 2016 Progress Report.

Consistent with historical sampling results, provided in Appendix C, the highest VOC concentrations, primarily TCE and its degradation products cis-1,2-dichloroethene (cis-1,2-DCE) and vinyl chloride (VC), continue to be detected in intermediate wells MW-2I and RW-3. TCE, which was previously detected at monitoring well MW-16I at elevated concentrations, has been biologically degraded and is no longer detected. Significant findings from the March 2017 sampling event include:

- TCE was not detected during the last sampling event in monitoring well MW-16I. This is the first-time TCE has not been detected in this well. Prior to implementation of field scale EISB pilot study the TCE concentration in well MW-16I was 25,100 µg/L. This confirms the efficacy of EISB as an effective remediation technology to address affected groundwater beneath the former manufacturing building.

- In the vicinity of the EISB pilot treatment area, the production of TCE daughter products continues to exceed the parent TCE. At well MW-16I, cis-1,2-DCE was detected at a concentration of 9,100 µg/L. The concentration of the daughter product cis-1,2-DCE indicates that biodegradation is occurring in the subsurface. The concentration of cis-1,2-DCE detected

during the March 2017 sampling event is the lowest measured since performance monitoring was initiated following the last injection event.

- TCE and degradation products continue to be detected in the samples collected from the intermediate wells MW-2I and RW-3 located immediately downgradient of the former cistern and TCE spill area. TCE concentrations of 14,000 µg/L and 9,000 µg/L were detected in MW-2I and RW-3, respectively.

- TCE concentrations have remained stable or are decreasing in off-site monitoring locations. For example, TCE levels continue to be below detection in well MW-7I supporting the conclusion that the plume emanating from the site is disconnected from the groundwater impacts detected at the MW-11 cluster. TCE concentrations have decreased since the last sampling event in MW-6I from 410 ug/L in 2016 to 290 ug/L in the most recent sampling event. The historical high concentration was 493 ug/L in 2009 and all subsequent results have been lower suggesting a stable/decreasing trend. Similarly, TCE concentrations have decreased in MW-9I from 1000 ug/L in 2016 to 630 ug/L in the most recent sampling event. The historical high concentration in MW-9I was 1,900 ug/L in 2007 and all subsequent results have been lower suggesting stable/decreasing trends.

- In the MW-11 well cluster, located on the western side of the North Oconee River, TCE was detected in well MW-11I at a concentration of 340 µg/L, while at MW-11S, TCE was detected at a concentration of 150 µg/L. TCE was not detected in MW-11D during the most recent sampling event. While the concentrations of VOCs detected at this location vary between sampling events, the values measured during this sampling event fall within the historical ranges.

In addition to semiannual groundwater sampling, Haley & Aldrich completed a rapid bioassessment by evaluating stream habitat and capturing macroinvertebrates at sampling stations located within the unnamed tributary and the North Oconee River on March 8, 2017. Observations were also made to evaluate if the ecosystems could support viable invertebrate and/or fish communities. This assessment was completed to address EPD's request for an ecological evaluation of the wetland areas surrounding the MW-11 well cluster. The methodology employed USEPA Rapid Bioassessment Protocols (Plafkin et al., 1989; Barbour et al., 1999) which provide, if local conditions permit, a semi-quantitative evaluation (categorical scoring) of both the stream habitat and the benthic community. Stream habitat was assessed against ideal functional stream metrics such as bottom substrate (e.g., cobble, mud, vegetation), channel flow regime (riffles, runs, pools), bank stability, riparian zone and water quality. A total of five stations were investigated, two stations (BS-01 and BS-02) in the North Oconee River and three stations in the unnamed tributary (BS-03, BS-04 and BS-05). Results indicate water quality measurements are within normal ranges for natural water and the presence of sensitive organisms demonstrate no adverse effects due to chemical stressors. The results of the rapid bioassessment report are provided in Appendix D.

3.4 REMEDIATION PROGRAM

As reported in the April 2016 semi-annual progress report, CTC has installed an injection array to evaluate the effectiveness of EISB to address the TCE groundwater hot-spot under the former manufacturing building in the vicinity of the MW-16 well pair. A summary of the construction details was outlined in the April 2016 semiannual progress report. Analytical results of pre-injection and post

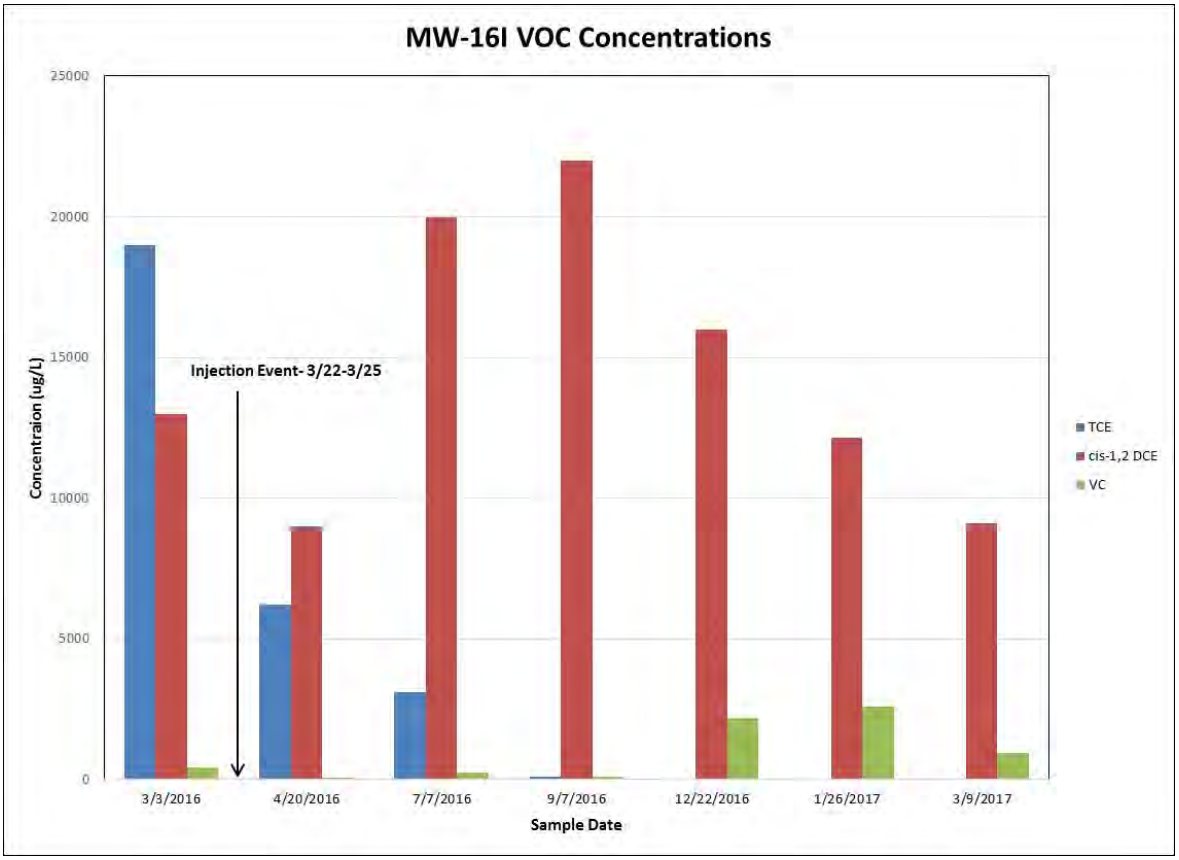
injection groundwater sampling can be found in Table IV. Significant findings from ongoing performance monitoring are outlined below. Injection points and monitoring points are shown on Figure 6.

MW-16I:

The field parameters measured at MW-16I indicate that the injection event was successful in creating a more conducive environment for biological reductive dechlorination and shows that the well continues to be influenced by the remedial injection event. The redox potential remains reducing at -134 mV, the pH has remained neutral at 6.46 s.u., and the dissolved oxygen concentration has remained low at 0.45 mg/L.

Geochemical parameters sampled still indicate a positive influence from the injection event with increased TOC concentrations which increased from 6.2 mg/L in the baseline event to 15,200 mg/L in April 2016 and then decreased TOC to 384 mg/L in March 2017. The decrease in TOC likely indicates that the indigenous bacteria are utilizing the electron donor that was injected into the subsurface. The concentration of ferrous iron is elevated at 36.4 mg/L with all the iron present in the reduced form indicating a very reducing environment. The concentration of sulfate has decreased from a high of 209 mg/L to below reporting limits of 5.0 mg/L in March 2017. The sulfate may have been utilized by sulfate reducing bacteria stimulated from the injection event. Many types of sulfate reducing bacteria are capable of reductive dechlorination through co-metabolic processes. Volatile Fatty Acids (VFAs) were analyzed in December 2016 and during the March sampling event. These analyses provide additional evidence to support significant biological activity. Lactic Acid was present at 37,000 mg/L in April 2016, which indicated influence from nearby injection points. In March 2017, the concentration of lactic acid has decreased significantly to below the laboratory detection limit of 10 mg/L and the concentration of other fatty acids continue to decrease rapidly. The shift of the VFAs indicate a continuous breakdown of the lactate from bacteria in the subsurface. The VFA data suggests a robust population of bacteria in the subsurface. Methane, ethane and ethene were analyzed during the March 2017 sampling event. Ethene concentration of 3,200 ug/L indicate dehalogenation of vinyl chloride and full degradation of TCE.

The concentration of TCE has decreased to below detection limits due to the increase in biological activity at the site from the injection event, with the potential for some abiotic reductive dechlorination from the iron present at the Site. The increase in cis-1,2-DCE is expected due to the step-wise reduction of TCE to cis-1,2-DCE to vinyl chloride. Concentrations of cis-1,2-DCE and vinyl chloride are expected to experience a limited, temporary increase in concentration and then subsequent decrease as these compounds are degraded to ethene. The amount of cis-1,2-DCE produced during the reductive dechlorination of TCE when converted to molar equivalency indicates that cis-1,2-DCE is being degraded in the subsurface. For instance, 144 molar equivalents of TCE have degraded since March 2016 to a maximum of 226 molar equivalents of cis-1,2-DCE in September 2016 to 93 molar equivalents during the March 2017 sampling event. The molar equivalency comparison shows that cis-1,2-DCE is being degraded in the subsurface. There also remains enough TOC and organic hydrogen donor for continued reductive dechlorination in the vicinity of MW-16I. Conditions remain ideal for biological reductive dechlorination based on the geochemical conditions and reductive dechlorination occurring in the subsurface.



MW-16D:

The field parameters measured at MW-16D indicate that the injection event continued to have no effect on MW-16D. There is no change in conductivity, a stable concentration of dissolved oxygen of 2.59 mg/L, a slight decrease in the redox potential which remains oxidative at +229 mV, and a stable pH of 5.29 s.u. Geochemical parameters also show no significant changes in concentrations which supports the hypothesis that the deeper zone was not influenced by the injection event.

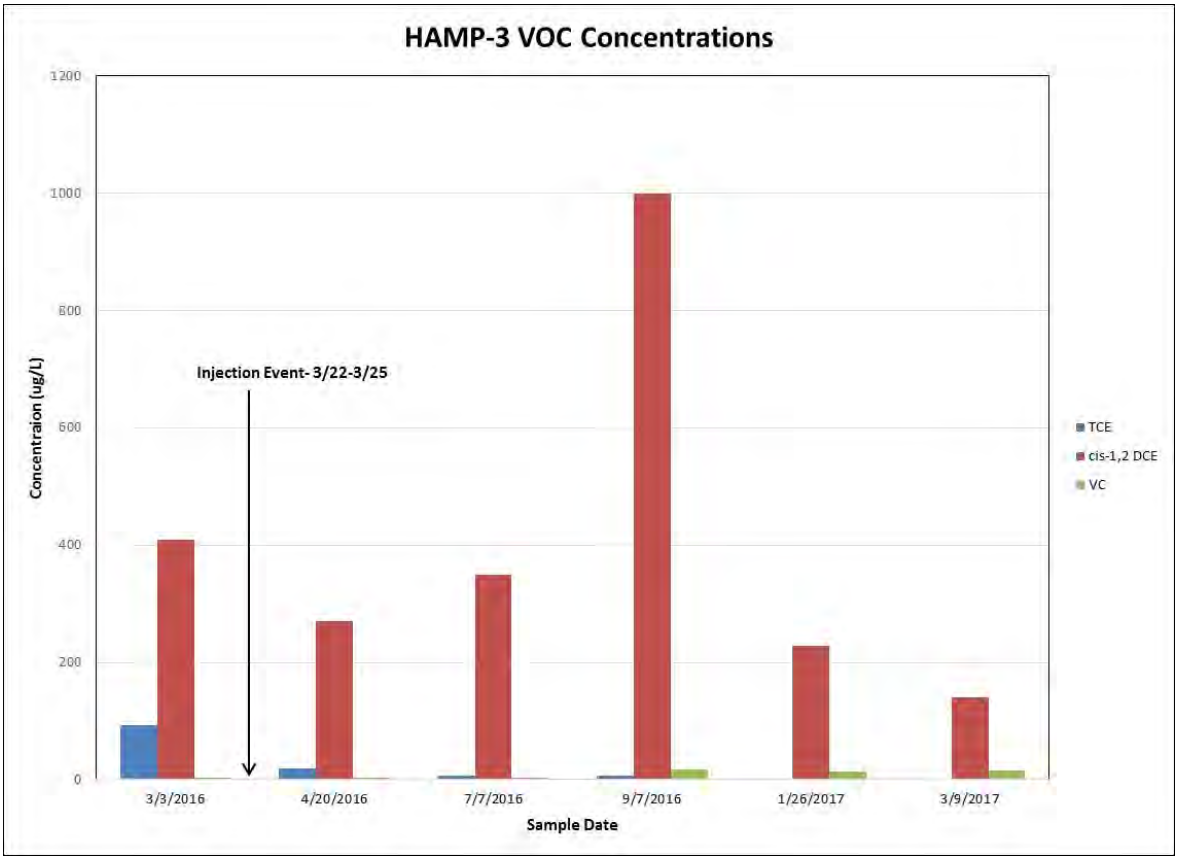
The VOC concentrations have also remained similar at 130 ug/L TCE and 50 ug/L cis-1,2-DCE. The injection event was not designed or anticipated to affect MW-16D. Any potential changes in concentration are most likely attributed to unstimulated biodegradation and natural dilution and dispersion of the contaminants.

HAMP-3:

The field parameters measured at HAMP-3 indicate that the treatment zone is expanding over time in the downgradient direction. The redox potential has stabilized around -167 mV, the pH has increased to 7.05 s.u., which is still within acceptable biodegradation ranges, and the dissolved oxygen concentration has decreased to 0.83 mg/L. Geochemical parameters indicate an influence from the injection event, especially in the concentration of TOC and VFAs. Total and ferrous iron indicate that the subsurface is reducing. In addition, TOC has continued to increase from 1900 mg/L in September 2016 to 2290 mg/L in March 2017. Lactic Acid was present at 160 mg/L in September 2016, which indicated influence from nearby injection points. In March 2017, the concentration of lactic acid has decreased to below the

laboratory detection limit of 10 mg/L and the concentration of other fatty acids continue to decrease. The shift of the VFAs indicate a continuous breakdown of the lactate from bacteria in the subsurface. Sulfate remains below the laboratory detection limit of 5 mg/L. Elevated methane concentration of 16,000 ug/L further support reducing conditions.

The VOC concentrations have continued to decrease following the injection event when compared to the baseline event. The concentration of TCE has decreased to below detection limits. Daughter products of TCE have increased following the injection event, indicating that reductive dechlorination is occurring near this well. Cis-1,2-DCE and vinyl chloride have increased between the September 2016 and March 2017 sampling events, however the geochemical conditions in the subsurface remain ideal for biological reductive dechlorination.

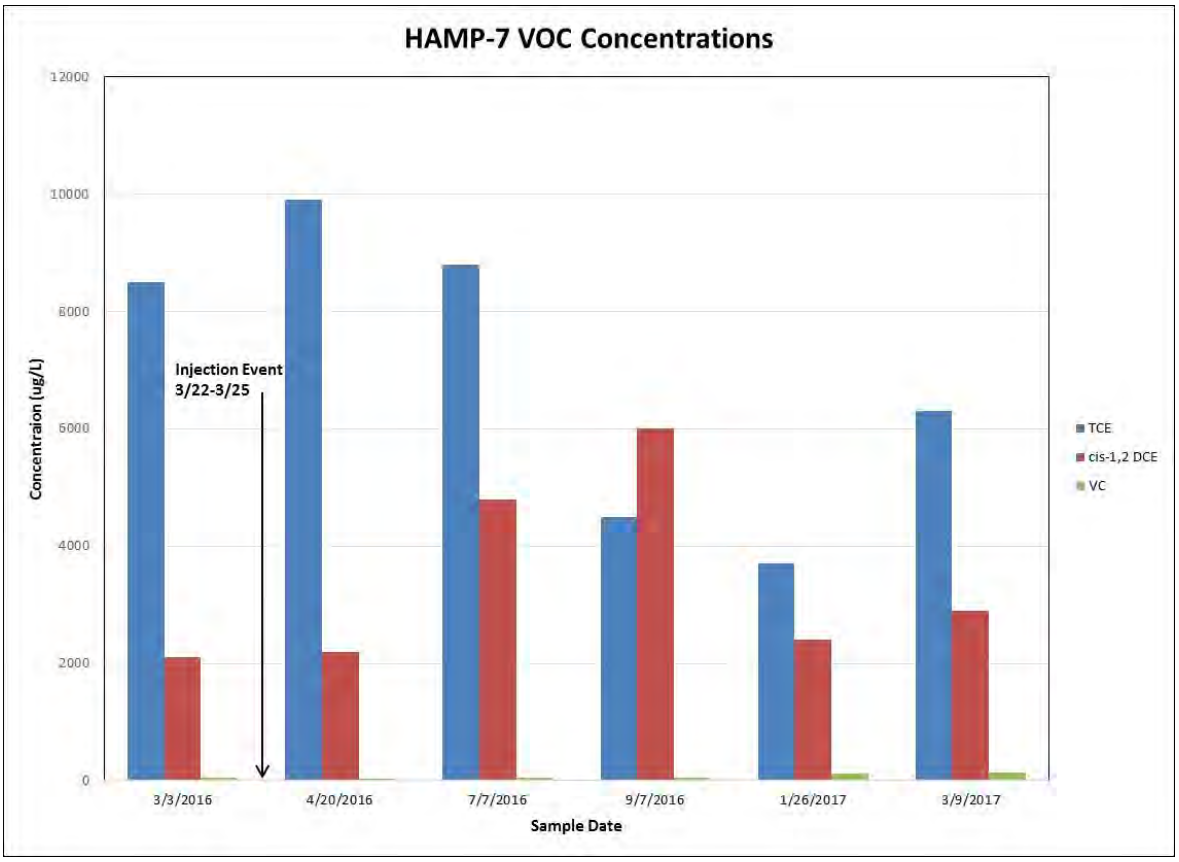


HAMP-7:

The field parameters measured at HAMP-7 indicate that the treatment zone initially expanded into the area surrounding this monitoring point. The redox potential is reducing at -156 mV, pH has become more neutral at 6.90 s.u. and dissolved oxygen concentration has remained low at 0.36 mg/L. Geochemical parameters initially indicated influence from the injection event, especially with iron, TOC, and VFA data. Sulfate has increased slightly from 23.8 mg/L in September 2016 to 25.2 mg/L in March 2017 and the concentration of iron has decreased significantly from 93.0 mg/L in September 2016 to 29.7 mg/l in March 2017. The ratio of ferrous iron to total iron indicates that the subsurface is continuing to be reducing and that enough iron exists to precipitate out any created sulfide in the subsurface. In addition, TOC concentrations have decreased significantly from 955 mg/L in September

2016 to 261 mg/L in March 2017. The decrease in TOC may indicate that the indigenous bacteria are utilizing the electron donor that was injected into the subsurface. In March 2017, the concentration of lactic acid has decreased significantly to below the laboratory detection limit of 10 mg/L and the concentration of other fatty acids continue to decrease with acetic acid, butyric acid and propionic acid at 170 mg/L, 74 mg/L and 350mg/L, respectively. The shift of the VFAs indicate a continuous breakdown of the lactate from bacteria in the subsurface. The VFA data suggests a robust population of bacteria in the subsurface. Ethene concentration of 310 ug/L indicate dehalogenation of vinyl chloride and complete degradation of TCE.

The VOC concentrations indicate stimulated reductive dechlorination near HAMP-7. Overall, TCE has decreased from almost 10,000 ug/L in March 2016 to 6,300 ug/L in March 2017, however the TCE measured in March 2017 has increased from the historical low measured in January 2017. While it appears that aquifer conditions remain favorable for biological degradation, the recent increase in TCE suggests that flux of TCE entering the treatment area is exceeding the rate of degradation and that consideration should be given to injecting additional amendments.

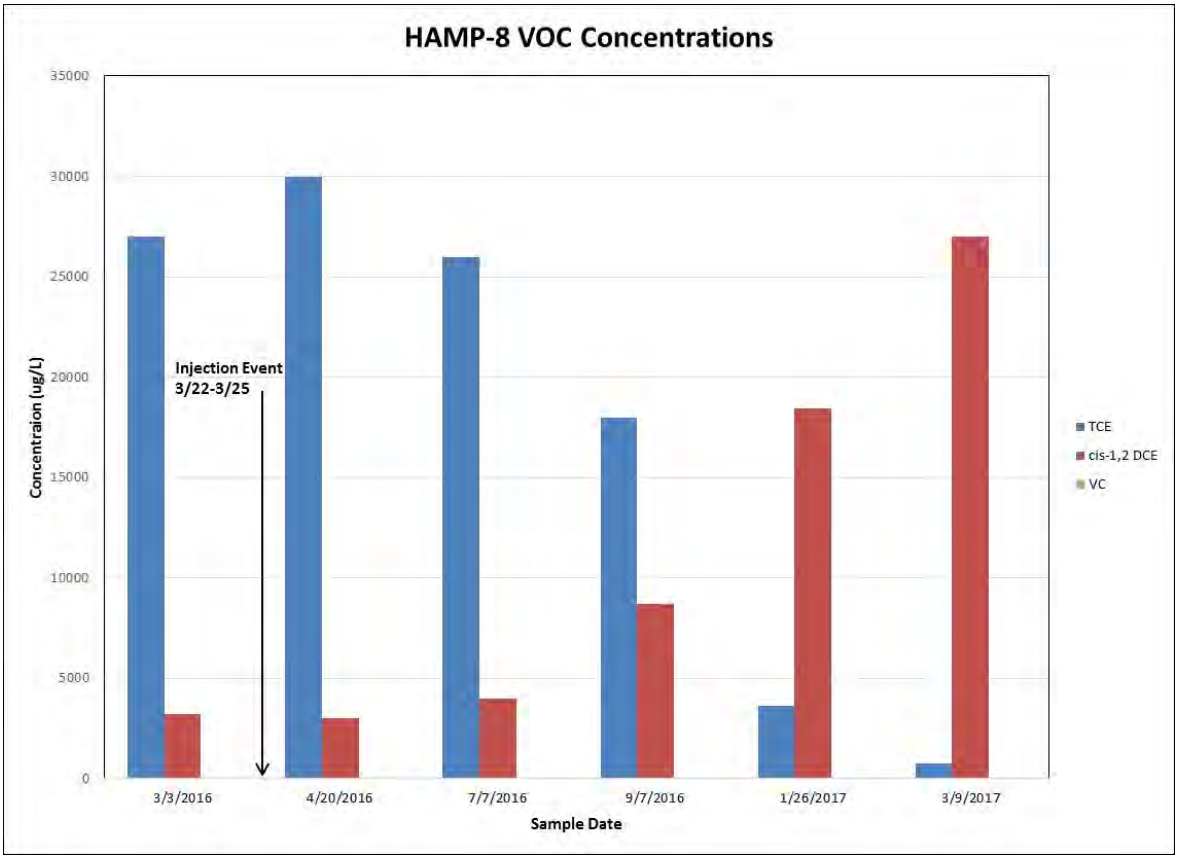


HAMP-8:

The field parameters and geochemical parameters measured at HAMP-8 indicate that the monitoring point continues to experience an influence from the remedial event. The redox potential continues to be reducing at -165 mV, the pH continues to increase at 6.60 s.u., and the dissolved oxygen

concentration remains low at 0.38 mg/L. The concentration of sulfate has decreased and the concentration of ferrous iron has decreased to 12.4 mg/L. The ratio of ferrous to total iron indicates that the subsurface continues to be reducing. In addition, the concentration of TOC has decreased between the September 2016 event and the March 2017 sampling event from 782 mg/L to 156 mg/L in March 2017. VFAs have also decreased and indicate biological activity. Lactic acid was present at 350 mg/L in September 2016 and it is now below detection limits of 10 mg/L. The biological breakdown products of lactic acid are still present at decreased concentrations with acetic acid, propionic acid and butyric acid present at 240 mg/L, below reporting limit of 5 mg/L, and 58 mg/L, respectively. The absence of lactic acid and the presence of breakdown VFAs such as acetic acid and propionic acid indicate biodegradation near HAMP-8.

The VOC concentrations have decreased dramatically during the performance sampling timeframe following the injection event indicating that reductive dechlorination is occurring near HAMP-8. TCE concentrations have decreased from 18,000 ug/L to 760 ug/L, a decrease of 96% and cis-1,2-DCE has increased from 8,700 ug/L in September 2016 to 27,000 ug/L in March 2017. Vinyl chloride was not detected, potentially due to dilution of the sample that resulted in an elevated detection limit of 50 ug/L. The increase in daughter products strongly indicate that biodegradation is occurring near HAMP-8. Additional decreases in TCE and daughter products is expected during subsequent sampling events.



4. Conclusions

Evidence from the most recent sampling effort documents stable or contracting groundwater plume(s) on and off the property and no unacceptable off-site vapor intrusion risks. The EISB pilot study confirms the efficacy of this remedial approach documenting the significant positive influence lactate injections have had on the TCE hot spot. Continuation of the pilot study is planned, with expansion of the pilot treatment area, additional injections, and bioaugmentation being considered. The results of the ongoing pilot will be reported in upcoming semi-annual reports. An updated milestone schedule, including semiannual groundwater and surface water sampling, is provided on Figure 7.

As required in the VRP guidance a monthly summary of hours invoiced and description of services provided since the last submittal is provided in Appendix E.

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TABLES

TABLE I
GROUNDWATER MONITORING PARAMETERS
CARPENTER – GENERAL TIME FACILITY
ATHENS, GEORGIA

WELL ID	WELL TYPE	SEPTEMBER 2015 ANALYTICAL PROGRAM
RW-1	Recovery Well	Water Level Only
RW-2	Recovery Well	Water Level Only
RW-3	Recovery Well	VOCs
RW-4	Recovery Well	VOCs
MW-1S	Shallow Overburden	VOCs
MW-1I	Intermediate Overburden	VOCs
MW-2S	Shallow Overburden	VOCs
MW-2I	Intermediate Overburden	VOCs
MW-2D	Deep Overburden	VOCs
MW-3I	Intermediate Overburden	VOCs
MW-4I	Intermediate Overburden	Destroyed
MW-5I	Intermediate Overburden	VOCs
MW-6I	Intermediate Overburden	VOCs
MW-7I	Intermediate Overburden	VOCs
MW-8I	Intermediate Overburden	VOCs
MW-9I	Intermediate Overburden	VOCs
MW-9D	Deep Overburden	VOCs
MW-11S	Shallow Overburden	VOCs
MW-11I	Intermediate Overburden	VOCs
MW-11D	Deep Overburden	VOCs
MW-16I	Shallow Overburden	VOCs + Injection COC's
MW-16D	Deep Overburden	VOCs
MP-3	Shallow Overburden	VOCs + Injection COC's
MP-7	Shallow Overburden	VOCs + Injection COC's
MP-8	Shallow Overburden	VOCs + Injection COC's

Notes:

- Volatile Organic Compounds (VOCs) include: Site Specific VOCs - cis-1,2-dichloroethene, 1,1,2-Trichloroethane, 1,1-Dichloroethene, Methylene chloride, trans-1,2-dichlrorethene, Trichloroethene, and Vinyl Chloride
- Injection COC's : Sulfate, total organic carbon (TOC), ferrous iron and volatile fatty acids (VFAs)
- Field Parameters include: water level, ph, conductivity, dissolved oxygen, temperature and oxidation reduction potential.

TABLE II
GROUNDWATER AND SURFACE WATER ANALYTICAL RESULTS
CARPENTER - GENERAL TIME FACILITY
ATHENS, GEORGIA

Location Name		MW-1I	MW-1I	MW-1I	MW-1I	MW-1S	MW-1S	MW-1S	MW-2D (DUP)	MW-2D	MW-2D	MW-2D	MW-2D
Sample Date		12/21/2011	9/16/2015	9/9/2016	3/6/2017	12/21/2011	9/16/2015	3/6/2017	12/22/2011	12/22/2011	2/21/2012	9/17/2015	9/8/2016
Field Parameters	Units												
Conductivity	mS/cm	0.053	0.065	0.069	0.061	0.036	0.042	0.028	-	0.205	0.167	-	0.229
Dissolved Oxygen	mg/L	8.64	6.58	3.79	5.61	8.32	0.86	1.08	-	1.08	1.1	-	0.56
ORP	mV	142.9	204	183	198	149	84	199	-	-30.1	3.8	-	-53
pH	s.u.	6.25	6.58	5.84	5.83	5.97	5.17	5.22	-	7.89	8.6	-	9.85
Temperature	°C	18	19.44	28.76	19.87	17.4	21.31	21.27	-	18.8	13.6	-	21.6
Turbidity	NTU	1.4	2.0	1.5	0.0	5.1	14.6	83.4	-	3.4	2.4	-	7.91
General Chemistry (mg/L)													
Alkalinity, Total (as CaCO3)	mg/L	**23.8**	-	-	-	**16.2**	-	-	**75.6**	**77.7**	**78.4**	-	-
Nitrate	mg/L	**0.66**	-	-	-	**0.56**	-	-	< 0.2	< 0.2	< 0.2	-	-
Nitrite (as N)	mg/L	< 0.1	-	-	-	< 0.1	-	-	< 0.1	< 0.1	< 0.1	-	-
Nitrite/Nitrate Nitrogen	mg/L	**0.66**	-	-	-	**0.56**	-	-	< 0.2	< 0.2	< 0.2	-	-
Sulfate	mg/L	< 5	-	-	-	< 5	-	-	**23.8**	**24.9**	**22.1**	-	-
Sulfide	mg/L	< 0.1	-	-	-	< 0.1	-	-	< 0.1	< 0.1	< 0.1	-	-
Total Organic Carbon (TOC)	mg/L	< 1	-	-	-	< 1	-	-	**1.6**	**1.7**	**1.4**	-	-
Iron	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Iron, Ferrous	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Fatty Acids (mg/L)													
Acetic Acid		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Propionic Acid		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Pyruvic Acid		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Butyric Acid		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Lactic Acid		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Dissolved Gases (ug/L)													
Ethane	ug/L	-	-	-	-	-	-	-	-	-	-	-	-
Ethene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-
Methane	ug/L	< 10	-	-	-	< 10	-	-	< 10	< 10	< 6.6	-	-
Volatile Organic Compounds (ug/L)													
1,1,2-Trichloroethane	ug/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	-	-	< 1
1,1-Dichloroethane		-	< 1	< 1	< 1	-	< 1	< 1	-	-	-	-	< 1
1,1-Dichloroethene	ug/L	< 1	-	< 1	< 1	< 1	-	< 1	< 1	< 1	-	-	< 1
cis-1,2-Dichloroethene	ug/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	-	< 1
Methylene chloride	ug/L	< 2	< 4	< 4	< 4	< 2	< 4	< 4	< 2	< 2	-	-	< 4
trans-1,2-Dichloroethene	ug/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	-	< 1
Trichloroethene	ug/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	**1.1**	< 1	< 1	-	**4**
Vinyl chloride	ug/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	-	< 1

Notes and Abbreviations:
1. Results shown in **bold** were detected.
2. < - Not detected above the laboratory detection limit.
3. Only detected compounds are shown in table.
4. - Not analyzed.

TABLE II
GROUNDWATER AND SURFACE WATER ANALYTICAL RESULTS
CARPENTER - GENERAL TIME FACILITY
ATHENS, GEORGIA

Location Name		MW-2D	MW-2I	MW-2I	MW-2I	MW-2I	MW-2I	MW-2S	MW-2S	MW-2S	MW-2S	MW-2S	MW-3I	MW-3I
Sample Date		3/9/2017	12/21/2011	2/20/2012	9/16/2015	9/7/2016	3/7/2017	12/21/2011	2/20/2012	9/16/2015	9/7/2016	3/7/2017	12/27/2011	9/17/2015
Field Parameters	Units													
Conductivity	mS/cm	0.225	0.064	0.068	0.087	0.105	0.096	0.06	0.84	0.109	0.125	0.116	0.092	0.101
Dissolved Oxygen	mg/L	0.99	2.54	1.5	4.11	0.29	1.25	6.86	4.00	3.41	0.67	3.35	3.34	4.69
ORP	mV	-87	151.9	61.4	83	109	208	156	52.1	192	131	223	78.6	110
pH	s.u.	8.97	5.89	5.87	6.62	6.07	5.14	5.58	5.7	6.39	5.63	6	6.27	7.61
Temperature	°C	19.27	18.9	17.0	22.42	34.73	20.21	19	16.2	22.38	35.85	19.35	18.5	21.59
Turbidity	NTU	0.00	5.1	3.0	1.0	8.2	43.9	2.2	4	0.2	38.3	11.8	4.8	0.2
General Chemistry (mg/L)														
Alkalinity, Total (as CaCO3)	mg/L	-	**29.2**	**28.6**	-	-	-	**19.5**	**26.5**	-	-	-	-	-
Nitrate	mg/L	-	**1.5**	**0.44**	-	-	-	**0.43**	**1.6**	-	-	-	-	-
Nitrite (as N)	mg/L	-	< 0.1	< 0.1	-	-	-	< 0.1	< 0.1	-	-	-	-	-
Nitrite/Nitrate Nitrogen	mg/L	-	**1.5**	**0.44**	-	-	-	**0.43**	**1.6**	-	-	-	-	-
Sulfate	mg/L	-	< 5	< 5	-	-	-	**7.9**	**12**	-	-	-	-	-
Sulfide	mg/L	-	< 0.1	< 0.1	-	-	-	< 0.1	< 0.1	-	-	-	-	-
Total Organic Carbon (TOC)	mg/L	-	**1.8**	**2.2**	-	-	-	**3.7**	**2.7**	-	-	-	-	-
Iron	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron, Ferrous	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Fatty Acids (mg/L)														
Acetic Acid		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Propionic Acid		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Pyruvic Acid		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Butyric Acid		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Lactic Acid		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Dissolved Gases (ug/L)														
Ethane	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-
Methane	ug/L	-	< 10	< 6.6	-	-	-	**11.2**	< 6.6	-	-	-	-	-
Volatile Organic Compounds (ug/L)														
1,1,2-Trichloroethane	ug/L	< 1	**2.7**	-	< 10	< 10	< 20	< 1	-	< 1	< 1	< 1	< 1	< 1
1,1-Dichloroethane		< 1	-	-	< 10	< 10	< 20	-	-	< 1	< 1	< 1	-	< 1
1,1-Dichloroethene	ug/L	< 1	**2.1**	-	-	< 10	< 20	< 1	-	-	**5**	< 1	< 1	-
cis-1,2-Dichloroethene	ug/L	< 1	**924**	**813**	**790**	**1600**	**1400**	**1**	< 1	< 1	**74**	< 1	< 1	< 1
Methylene chloride	ug/L	< 4	< 2	-	< 40	< 40	< 20	< 2	-	< 4	< 4	< 4	< 2	< 4
trans-1,2-Dichloroethene	ug/L	< 1	**24.1**	< 100	**12**	**25**	**23**	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Trichloroethene	ug/L	**2**	**11500**	**9430**	**7800**	**12000**	**14000**	**2.9**	< 1	< 1	**100**	< 1	< 1	< 1
Vinyl chloride	ug/L	< 1	**1.3**	< 100	< 10	< 10	< 20	< 1	< 1	< 1	< 1	< 1	< 1	< 1

Notes and Abbreviations:
1. Results shown in **bold** were detected.
2. < - Not detected above the laboratory detection limit.
3. Only detected compounds are shown in table.
4. - Not analyzed.

TABLE II
GROUNDWATER AND SURFACE WATER ANALYTICAL RESULTS
CARPENTER - GENERAL TIME FACILITY
ATHENS, GEORGIA

Location Name		MW-3I	MW-3I	MW-4I	MW-5I	MW-5I	MW-5I	MW-5I	MW-5I	MW-6I	MW-6I	MW-6I	MW-6I
Sample Date		9/8/2016	3/8/2017	12/22/2011	12/27/2011	2/21/2012	9/17/2015	9/12/2016	3/7/2017	12/19/2011	9/17/2015	9/9/2016	3/7/2017
Field Parameters	Units												
Conductivity	mS/cm	0.099	0.111	0.088	0.101	0.098	0.109	0.101	0.116	0.74	0.082	0.094	0.097
Dissolved Oxygen	mg/L	2.81	3.32	2.11	5.5	1.79	1.87	2.2	2.15	1.33	3.85	0.76	1.19
ORP	mV	70	47	19.5	49.1	73.2	121	92	164	209.1	114	200	190
pH	s.u.	6.00	6.14	6.21	6.53	6.39	6.8	6.26	6.71	5.64	6.82	5.59	5.78
Temperature	°C	24.4	20.62	17.4	20.5	21.7	24.71	26.36	22.89	19.3	23.84	24.21	20.54
Turbidity	NTU	29.5	132	6.3	5.1	2.3	0.0	0.0	5.4	7.9	0.0	9.8	57.1
General Chemistry (mg/L)													
Alkalinity, Total (as CaCO3)	mg/L	-	-	**41**	**44.1**	**43.2**	-	-	-	-	-	-	-
Nitrate	mg/L	-	-	**0.67**	**0.84**	**0.84**	-	-	-	-	-	-	-
Nitrite (as N)	mg/L	-	-	< 0.1	< 0.1	< 0.1	-	-	-	-	-	-	-
Nitrite/Nitrate Nitrogen	mg/L	-	-	**0.67**	**0.84**	**0.84**	-	-	-	-	-	-	-
Sulfate	mg/L	-	-	< 5	< 5	< 5	-	-	-	-	-	-	-
Sulfide	mg/L	-	-	< 0.1	< 0.1	< 0.1	-	-	-	-	-	-	-
Total Organic Carbon (TOC)	mg/L	-	-	**13.6**	**1.5**	**1.6**	-	-	-	-	-	-	-
Iron	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Iron, Ferrous	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Fatty Acids (mg/L)													
Acetic Acid		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Propionic Acid		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Pyruvic Acid		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Butyric Acid		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Lactic Acid		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Dissolved Gases (ug/L)													
Ethane	ug/L	-	-	-	-	-	-	-	-	-	-	-	-
Ethene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-
Methane	ug/L	-	-	< 10	< 10	< 6.6	-	-	-	-	-	-	-
Volatile Organic Compounds (ug/L)													
1,1,2-Trichloroethane	ug/L	< 1	< 1	< 1	< 1	-	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,1-Dichloroethane		< 1	< 1	-	-	-	< 1	< 1	< 1	-	< 1	< 1	< 1
1,1-Dichloroethene	ug/L	< 1	< 1	< 1	< 1	-	-	< 1	< 1	< 1	-	< 1	< 1
cis-1,2-Dichloroethene	ug/L	< 1	< 1	< 1	**2.8**	**2.2**	**3**	**3**	**3**	**70.6**	< 1	**49**	**41**
Methylene chloride	ug/L	< 4	< 4	< 2	< 2	-	< 4	< 4	< 4	< 2	< 4	< 4	< 4
trans-1,2-Dichloroethene	ug/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Trichloroethene	ug/L	< 1	< 1	**1.9**	**96.1**	< 1	**81**	**78**	**74**	**438**	**7**	**410**	**290**
Vinyl chloride	ug/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1

Notes and Abbreviations:
1. Results shown in **bold** were detected.
2. < - Not detected above the laboratory detection limit.
3. Only detected compounds are shown in table.
4. - Not analyzed.

TABLE II
GROUNDWATER AND SURFACE WATER ANALYTICAL RESULTS
CARPENTER - GENERAL TIME FACILITY
ATHENS, GEORGIA

Location Name		MW-7I	MW-7I	MW-7I	MW-7I	MW-7I	MW-8I	MW-8I	MW-8I	MW-8I	MW-8I	MW-9D	MW-9D
Sample Date		12/27/2011	2/21/2012	9/17/2015	9/12/2016	3/7/2017	12/27/2011	10/13/2014	9/17/2015	9/12/2016	3/7/2017	12/21/2011	2/21/2012
Field Parameters	Units												
Conductivity	mS/cm	0.122	0.124	0.126	0.118	0.138	0.312	-	0.32	0.246	0.299	0.166	0.167
Dissolved Oxygen	mg/L	0.35	0.12	0.58	0.57	0.4	7.85	-	2.1	1.32	5.1	0.51	0.27
ORP	mV	45.9	21	129	67	128	149	-	193	155	198	-171	-115
pH	s.u.	6.2	6.19	6.46	6.15	6.59	5.46	-	5.85	5.47	6.1	8.62	8.8
Temperature	°C	18.8	19.3	23.43	26.54	19.22	16.2	-	25.8	28.83	18.68	19.9	18.4
Turbidity	NTU	5	0.9	0.0	0.0	3.2	4.2	-	2.5	0	16.9	1.5	4
General Chemistry (mg/L)													
Alkalinity, Total (as CaCO3)	mg/L	**57.8**	**46.4**	-	-	-	-	-	-	-	-	**84.4**	**84.8**
Nitrate	mg/L	< 0.2	< 0.2	-	-	-	-	-	-	-	-	< 0.2	< 0.2
Nitrite (as N)	mg/L	< 0.1	< 0.1	-	-	-	-	-	-	-	-	< 0.1	< 0.1
Nitrite/Nitrate Nitrogen	mg/L	< 0.2	< 0.2	-	-	-	-	-	-	-	-	< 0.2	< 0.2
Sulfate	mg/L	< 5	< 5	-	-	-	-	-	-	-	-	**9.1**	**9.2**
Sulfide	mg/L	< 0.1	< 0.1	-	-	-	-	-	-	-	-	< 0.1	< 0.1
Total Organic Carbon (TOC)	mg/L	**2.4**	**18.8**	-	-	-	-	-	-	-	-	**2.2**	**2.7**
Iron	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Iron, Ferrous	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Fatty Acids (mg/L)													
Acetic Acid		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Propionic Acid		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Pyruvic Acid		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Butyric Acid		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Lactic Acid		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Dissolved Gases (ug/L)													
Ethane	ug/L	-	-	-	-	-	-	-	-	-	-	-	-
Ethene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-
Methane	ug/L	**206**	**135**	-	-	-	-	-	-	-	-	< 10	< 6.6
Volatile Organic Compounds (ug/L)													
1,1,2-Trichloroethane	ug/L	< 1	-	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1	-
1,1-Dichloroethane		-	-	< 1	< 1	< 1	-	-	< 1	< 1	< 1	-	-
1,1-Dichloroethene	ug/L	< 1	-	-	< 1	< 1	< 1	< 5	-	< 1	< 1	< 1	-
cis-1,2-Dichloroethene	ug/L	**2.5**	**2.3**	**3**	**2**	**2**	< 1	< 5	< 1	< 1	< 1	< 1	< 1
Methylene chloride	ug/L	< 2	-	< 4	< 4	< 4	< 2	< 5	< 4	< 4	< 4	< 2	-
trans-1,2-Dichloroethene	ug/L	< 1	< 1	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1	< 1
Trichloroethene	ug/L	**2.3**	**1**	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1	< 1
Vinyl chloride	ug/L	< 1	< 1	**5**	**3**	**3**	< 1	< 2	< 1	< 1	< 1	**1.2**	**1.2**

Notes and Abbreviations:
1. Results shown in **bold** were detected.
2. < - Not detected above the laboratory detection limit.
3. Only detected compounds are shown in table.
4. - Not analyzed.

TABLE II
GROUNDWATER AND SURFACE WATER ANALYTICAL RESULTS
CARPENTER - GENERAL TIME FACILITY
ATHENS, GEORGIA

Location Name		MW-9D	MW-9D	MW-9D	MW-9I	MW-9I	MW-9I	MW-9I	MW-9I	MW-11D	MW-11D	MW-11D	MW-11D	MW-11D
Sample Date		9/17/2015	9/9/2016	3/7/2017	12/21/2011	2/21/2012	9/17/2015	9/9/2016	3/7/2017	12/22/2011	2/20/2012	9/18/2015	9/8/2016	3/8/2017
Field Parameters	Units													
Conductivity	mS/cm	0.203	0.184	0.22	0.122	0.129	0.137	0.169	0.147	0.98	0.87	0.288	0.678	0.859
Dissolved Oxygen	mg/L	1.72	0.57	5.21	0.35	0.39	2.59	0.32	3.19	0.69	-0.7	1.84	0.25	0.47
ORP	mV	51	-151	-47	153.6	73.5	133	178	193	-335	-286.9	-75	-369	-339
pH	s.u.	7.85	8.19	9.16	6.18	6.23	6.72	6.11	6.27	7.03	7.3	6.99	7.7	6.89
Temperature	°C	27.4	24.49	17.86	19.6	18.4	24.67	25.40	18.31	16.7	15.7	18.12	19.2	14.93
Turbidity	NTU	0.5	0	10.5	3	1.3	0.0	0.0	-	5.1	4.8	2.4	0	3.3
General Chemistry (mg/L)														
Alkalinity, Total (as CaCO3)	mg/L	-	-	-	**61.7**	**59.3**	-	-	-	**441**	**376**	-	-	-
Nitrate	mg/L	-	-	-	**0.48**	**0.48**	-	-	-	< 0.2	< 0.2	-	-	-
Nitrite (as N)	mg/L	-	-	-	< 0.1	< 0.1	-	-	-	**1.5**	**0.77**	-	-	-
Nitrite/Nitrate Nitrogen	mg/L	-	-	-	**0.48**	**0.48**	-	-	-	< 0.2	< 0.2	-	-	-
Sulfate	mg/L	-	-	-	< 5	< 5	-	-	-	**5.2**	**7.8**	-	-	-
Sulfide	mg/L	-	-	-	< 0.1	< 0.1	-	-	-	**57.8**	**4.6**	-	-	-
Total Organic Carbon (TOC)	mg/L	-	-	-	**2.4**	**3.2**	-	-	-	**42.8**	**33.7**	-	-	-
Iron	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron, Ferrous	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Fatty Acids (mg/L)														
Acetic Acid		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Propionic Acid		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Pyruvic Acid		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Butyric Acid		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Lactic Acid		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Dissolved Gases (ug/L)														
Ethane	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-	-
Methane	ug/L	-	-	-	< 10	**7.3**	-	-	-	**28000**	**13000**	-	-	-
Volatile Organic Compounds (ug/L)														
1,1,2-Trichloroethane	ug/L	< 1	< 1	< 1	< 1	-	< 1	< 2	< 1	< 1	-	< 1	< 1	< 1
1,1-Dichloroethane		< 1	< 1	< 1	-	-	< 1	< 2	< 1	-	-	< 1	< 1	< 1
1,1-Dichloroethene	ug/L	-	< 1	< 1	**1.2**	-	-	**2**	< 1	< 1	-	-	< 1	< 1
cis-1,2-Dichloroethene	ug/L	< 1	< 1	< 1	**113**	**91.9**	**34**	**87**	**62**	**8**	**7.7**	< 1	**1**	**1**
Methylene chloride	ug/L	< 4	< 4	< 4	< 2	-	< 4	< 4	< 4	< 2	-	< 4	< 4	< 4
trans-1,2-Dichloroethene	ug/L	< 1	< 1	< 1	< 1	< 10	< 1	< 2	< 1	< 1	< 1	< 1	< 1	< 1
Trichloroethene	ug/L	< 1	< 1	< 1	**1110**	**1070**	**420**	**1000**	**630**	< 1	< 1	< 1	**3**	< 1
Vinyl chloride	ug/L	< 1	**1**	**1**	< 1	< 10	< 1	< 2	< 1	< 1	< 1	< 1	< 1	< 1

Notes and Abbreviations:
1. Results shown in **bold** were detected.
2. < - Not detected above the laboratory detection limit.
3. Only detected compounds are shown in table.
4. - Not analyzed.

TABLE II
GROUNDWATER AND SURFACE WATER ANALYTICAL RESULTS
CARPENTER - GENERAL TIME FACILITY
ATHENS, GEORGIA

Location Name		MW-11I	MW-11I	MW-11I	MW-11I	MW-11I	MW-11S	MW-11S	MW-11S	MW-11S	MW-11S	MW-14D	MW-14I
Sample Date		12/20/2011	2/20/2012	9/18/2015	9/8/2016	3/8/2017	12/20/2011	2/20/2012	9/18/2015	9/8/2016	3/8/2017	12/20/2011	12/20/2011
Field Parameters	Units												
Conductivity	mS/cm	0.08	0.08	0.108	0.096	0.11	0.035	0.053	0.161	0.056	0.077	0.105	0.06
Dissolved Oxygen	mg/L	2.42	1.7	3.1	0.96	2.35	0.76	0.72	3.67	0.24	0.8	3.1	1.48
ORP	mV	154	136.4	220	246	204	187	80.5	261	330	147	154.9	85.1
pH	s.u.	5.82	5.96	5.82	5.41	6.13	5.25	5.19	4.56	4.26	5.24	6.28	6.13
Temperature	°C	16	15.3	18.74	19.45	16.61	16.3	13.6	19.83	23.84	16.93	16	15.4
Turbidity	NTU	4.3	2.4	2.4	0	-	4.7	4.6	37.5	20.6	-	0.9	5.7
General Chemistry (mg/L)													
Alkalinity, Total (as CaCO3)	mg/L	**37.9**	**39.2**	-	-	-	**6.5**	**9.5**	-	-	-	**51.3**	**26**
Nitrate	mg/L	**0.88**	**0.96**	-	-	-	**0.48**	< 0.2	-	-	-	< 0.2	< 0.2
Nitrite (as N)	mg/L	< 0.1	< 0.1	-	-	-	< 0.1	< 0.1	-	-	-	< 0.1	< 0.1
Nitrite/Nitrate Nitrogen	mg/L	**0.88**	**0.96**	-	-	-	**0.48**	< 0.2	-	-	-	< 0.2	< 0.2
Sulfate	mg/L	< 5	< 5	-	-	-	< 5	**6.1**	-	-	-	< 5	< 5
Sulfide	mg/L	< 0.1	< 0.1	-	-	-	< 0.1	< 0.1	-	-	-	< 0.1	< 0.1
Total Organic Carbon (TOC)	mg/L	**1.8**	**1.8**	-	-	-	**2**	**2.9**	-	-	-	**1.5**	**1.5**
Iron	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Iron, Ferrous	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Fatty Acids (mg/L)													
Acetic Acid		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Propionic Acid		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Pyruvic Acid		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Butyric Acid		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Lactic Acid		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Dissolved Gases (ug/L)													
Ethane	ug/L	-	-	-	-	-	-	-	-	-	-	-	-
Ethene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-
Methane	ug/L	< 10	< 6.6	-	-	-	< 10	< 6.6	-	-	-	< 10	**30**
Volatile Organic Compounds (ug/L)													
1,1,2-Trichloroethane	ug/L	< 1	-	< 1	< 1	< 1	< 1	-	< 1	< 1	< 1	< 1	< 1
1,1-Dichloroethane		-	-	< 1	< 1	< 1	-	-	< 1	< 1	< 1	-	-
1,1-Dichloroethene	ug/L	< 1	-	-	< 1	< 1	< 1	-	-	< 1	< 1	< 1	< 1
cis-1,2-Dichloroethene	ug/L	**50**	**33.4**	**44**	**44**	**41**	**26.7**	**50.9**	**30**	**29**	**72**	< 1	< 1
Methylene chloride	ug/L	< 2	-	< 4	< 4	< 4	< 2	-	< 4	< 4	< 4	< 2	< 2
trans-1,2-Dichloroethene	ug/L	< 1	< 5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Trichloroethene	ug/L	**766**	**540**	**490**	**510**	**340**	**356**	**183**	**260**	**280**	**150**	< 1	< 1
Vinyl chloride	ug/L	< 1	< 5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1

Notes and Abbreviations:
1. Results shown in **bold** were detected.
2. < - Not detected above the laboratory detection limit.
3. Only detected compounds are shown in table.
4. - Not analyzed.

TABLE II
GROUNDWATER AND SURFACE WATER ANALYTICAL RESULTS
CARPENTER - GENERAL TIME FACILITY
ATHENS, GEORGIA

Location Name		MW-16D	MW-16D (DUP)	MW-16D	MW-16D	MW-16D	MW-16D	MW-16D	MW-16D	MW-16D	MW-16D	MW-16I	MW-16I
Sample Date		12/22/2011	2/22/2012	2/22/2012	9/16/2015	3/3/2016	4/20/2016	7/7/2016	9/7/2016	1/26/2017	3/9/2017	12/22/2011	2/22/2012
Field Parameters	Units												
Conductivity	mS/cm	0.088	-	0.105	0.112	0.112	0.109	0.114	0.103	0.118	0.115	0.498	0.649
Dissolved Oxygen	mg/L	3.51	-	1.97	2.55	1.93	1.15	1.78	1.59	2.41	2.59	1.68	1.12
ORP	mV	84	-	124.3	176	137	166	93	266	95	229	125.4	162.4
pH	s.u.	5.85	-	5.99	6.37	6.24	5.37	6.46	5.28	5.98	5.29	5.32	5.42
Temperature	°C	19.9	-	18.9	20.73	18.86	20.85	21.23	26.78	19.73	17.07	20.2	19.3
Turbidity	NTU	3.1	-	2.3	4.7	0.00	0.6	0.8	0	0.3	-	5.2	1.9
General Chemistry (mg/L)													
Alkalinity, Total (as CaCO3)	mg/L	**30.5**	-	-	-	-	-	-	-	-	-	**25.2**	-
Nitrate	mg/L	**1.1**	**1.2**	**1.2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**5.9**	**5.8**
Nitrite (as N)	mg/L	< 0.1	< 0.1	< 0.1	-	-	-	-	-	-	-	**0.24**	**0.18**
Nitrite/Nitrate Nitrogen	mg/L	**1.1**	**1.2**	**1.2**	**-**	-	-	-	-	-	-	**6.2**	**6**
Sulfate	mg/L	**10.3**	-	-	-	**8.1**	**7.9**	**7.4**	**8.1**	**-**	**7.2**	**166**	-
Sulfide	mg/L	< 0.1	< 0.1	< 0.1	-	-	-	-	-	-	-	< 0.1	< 0.1
Total Organic Carbon (TOC)	mg/L	**2.2**	**1.8**	**1.9**	**-**	< 1.0	1.2	< 1.0	1.0	-	< 1.0	**11.3**	**12**
Iron	mg/L	-	-	-	**-**	-	-	< 0.200	< 0.200	-	< 0.200	**-**	**-**
Iron, Ferrous	mg/L	-	-	-	**-**	< 0.05	**0.095**	**0.088**	< 0.050	-	< 0.050	**-**	**-**
Volatile Fatty Acids (mg/L)													
Acetic Acid		**-**	**-**	**-**	**-**	**-**	< 5.0	**-**	**-**	**-**	< 5.0	**-**	**-**
Propionic Acid		**-**	**-**	**-**	**-**	**-**	< 5.0	**-**	**-**	**-**	< 5.0	**-**	**-**
Pyruvic Acid		**-**	**-**	**-**	**-**	**-**	< 5.0	**-**	**-**	**-**	< 5.0	**-**	**-**
Butyric Acid		**-**	**-**	**-**	**-**	**-**	< 5.0	**-**	**-**	**-**	< 5.0	**-**	**-**
Lactic Acid		**-**	**-**	**-**	**-**	**-**	< 10	**-**	**-**	**-**	< 5.0	**-**	**-**
Dissolved Gases (ug/L)													
Ethane	ug/L	-	-	-	-	-	-	-	-	-	< 5.0	-	-
Ethene	ug/L	-	-	-	-	-	-	-	-	-	< 5.0	-	-
Methane	ug/L	< 10	< 6.6	< 6.6	-	-	-	-	-	-	< 5.0	**27.7**	**35.8**
Volatile Organic Compounds (ug/L)													
1,1,2-Trichloroethane	ug/L	< 1	-	-	< 1	< 1.0	< 1.0	< 1.0	< 1	-	< 1	**9.1**	-
1,1-Dichloroethane		-	-	-	< 1	< 1.0	< 1.0	< 1.0	< 1	-	< 1	-	-
1,1-Dichloroethene	ug/L	< 1	-	-	-	-	-	-	< 1	-	< 1	**3.2**	-
cis-1,2-Dichloroethene	ug/L	**34.2**	**28.2**	**28.8**	**36**	**37.0**	**35.0**	**38.0**	**43**	**49.9**	**50**	**7360**	**10600**
Methylene chloride	ug/L	< 2	-	-	< 4	< 4.0	< 4.0	< 4.0	< 4	-	< 4	**5.2**	-
trans-1,2-Dichloroethene	ug/L	< 1	< 1	< 1	< 1	< 1.0	< 1.0	< 1.0	< 1	-	< 1	**126**	< 100
Trichloroethene	ug/L	**114**	**90.4**	**95.9**	**110**	**110**	**120**	**110**	**110**	**126.2**	**130**	**17800**	**19700**
Vinyl chloride	ug/L	< 1	< 1	< 1	< 1	< 1.0	< 1.0	< 1.0	< 1	< 5.0	< 1	**109**	**164**

Notes and Abbreviations:
1. Results shown in **bold** were detected.
2. < - Not detected above the laboratory detection limit.
3. Only detected compounds are shown in table.
4. - Not analyzed.

TABLE II
GROUNDWATER AND SURFACE WATER ANALYTICAL RESULTS
CARPENTER - GENERAL TIME FACILITY
ATHENS, GEORGIA

Location Name		MW-16I	MW-16I	MW-16I	MW-16I	MW-16I	MW-16I	MW-16I	MW-16I	RW-1	RW-1	RW-2	RW-2
Sample Date		9/16/2015	3/3/2016	4/20/2016	7/7/2016	9/7/2016	12/22/2016	1/26/2017	3/9/2017	12/19/2011	2/21/2012	12/19/2011	2/22/2012
Field Parameters	Units												
Conductivity	mS/cm	0.626	0.771	24.9	7.5	5.19	2.97	2.33	2.06	0.04	0.15	0.07	0.72
Dissolved Oxygen	mg/L	1.38	0.00	0.00	0.19	0.6	1.54	1.72	0.45	0.38	0.2	3.83	2.45
ORP	mV	-21	-13	-155	-128	-118	-73	-139	-134	162.8	3.8	152.9	108.4
pH	s.u.	6.31	6.37	7.04	6.95	6.15	6.4	6.24	6.46	5.31	5.95	6.13	6.15
Temperature	°C	21.33	19.49	20.72	21.05	23.84	20.37	19.78	17.31	19.8	19.2	19.6	18.2
Turbidity	NTU	8.7	32.6	488	58.1	41.3	20.6	68.2	1.68	-0.2	2.1	11.5	1.5
General Chemistry (mg/L)													
Alkalinity, Total (as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate	mg/L	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	-	-	-	-
Nitrite (as N)	mg/L	**-**	**-**	**-**	**-**	**-**	-	-	**-**	-	-	-	-
Nitrite/Nitrate Nitrogen	mg/L	**-**	**-**	**-**	**-**	**-**	**-**	-	**-**	-	-	-	-
Sulfate	mg/L	-	**209**	**50**	< 5.0	< 5.0	< 5.0	**-**	< 5.0	-	-	-	-
Sulfide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon (TOC)	mg/L	**-**	**6.2**	**15200**	**2900**	**3020**	**746**	-	**384**	-	-	-	-
Iron	mg/L	**-**	-	-	**75.7**	**107**	**50.3**	-	**35.8**	-	-	-	-
Iron, Ferrous	mg/L	**-**	**2.5**	**63.8**	**78.9**	**122**	**55.1**	-	**36.4**	-	-	-	-
Volatile Fatty Acids (mg/L)													
Acetic Acid		**-**	-	< 500	**1900**	**2000**	**730**	**-**	**420**	**-**	**-**	**-**	**-**
Propionic Acid		**-**	-	< 500	**2200**	**2200**	**440**	**-**	**170**	**-**	**-**	**-**	**-**
Pyruvic Acid		**-**	-	< 500	< 25	< 50	< 10	**-**	< 5.0	**-**	**-**	**-**	**-**
Butyric Acid		**-**	-	< 500	**33**	**360**	**350**	**-**	**120**	**-**	**-**	**-**	**-**
Lactic Acid		**-**	-	**37000**	**2200**	**120**	< 20	**-**	< 10.0	**-**	**-**	**-**	**-**
Dissolved Gases (ug/L)													
Ethane	ug/L	-	-	-	-	-	-	-	**6.5**	-	-	-	-
Ethene	ug/L	-	-	-	-	-	-	-	**3200**	-	-	-	-
Methane	ug/L	**-**	**-**	**-**	**-**	**-**	**-**	-	**2000**	-	-	-	-
Volatile Organic Compounds (ug/L)													
1,1,2-Trichloroethane	ug/L	< 20	< 20	< 10	< 20	< 1	< 10	-	< 20	< 1	-	< 1	-
1,1-Dichloroethane		< 20	< 20	< 10	< 20	**5**	< 10	-	< 20	-	-	-	-
1,1-Dichloroethene	ug/L	-	-	-	-	**12**	**14**	-	< 20	< 1	-	< 1	-
cis-1,2-Dichloroethene	ug/L	**15000**	**13000**	**9000**	**20000**	**22000**	**16000**	**12151.5**	**9100**	**404**	**784**	**3**	**2.6**
Methylene chloride	ug/L	< 80	< 80	< 40	< 80	< 4	< 40	-	< 80	< 2	-	< 2	-
trans-1,2-Dichloroethene	ug/L	**48**	**37**	**190**	**360**	**250**	**560**	-	**270**	< 1	< 5	< 1	< 1
Trichloroethene	ug/L	**13000**	**19000**	**6200**	**3100**	**97**	< 10	<1000	< 20	**987**	**2390**	**39.8**	**38.9**
Vinyl chloride	ug/L	**570**	**440**	**75**	**240**	**110**	**2200**	**2581.1**	**950**	**9.6**	**35.3**	< 1	< 1

Notes and Abbreviations:
1. Results shown in **bold** were detected.
2. < - Not detected above the laboratory detection limit.
3. Only detected compounds are shown in table.
4. - Not analyzed.

TABLE II
GROUNDWATER AND SURFACE WATER ANALYTICAL RESULTS
CARPENTER - GENERAL TIME FACILITY
ATHENS, GEORGIA

Location Name		RW-3	RW-3	RW-3	RW-3	RW-3	RW-4	RW-4	RW-4	RW-4	RW-4	SW-1	SW-1
Sample Date		12/19/2011	2/22/2012	9/16/2015	9/8/2016	3/9/2017	12/19/2011	2/22/2012	9/16/2015	9/8/2016	3/9/2017	9/23/2013	10/13/2014
Field Parameters	Units												
Conductivity	mS/cm	0.131	0.146	0.282	0.205	0.173	0.08	0.087	0.111	0.094	0.087	-	-
Dissolved Oxygen	mg/L	0.43	0.64	1.43	0.53	0.77	2.99	2.6	3.6	3.52	5.25	-	-
ORP	mV	102.2	67.6	30	84	66	144.2	109.5	193	125	150	-	-
pH	s.u.	8.95	9.5	7.95	6.54	6.67	6.54	6.66	7.09	6.26	5.97	-	-
Temperature	°C	19.8	17.9	21.68	23.73	21.54	19.8	17.2	20.52	22.73	18.99	-	-
Turbidity	NTU	5.1	4	0.5	57.2	18.4	5.8	4.6	3.7	243	1.18	-	-
General Chemistry (mg/L)													
Alkalinity, Total (as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Nitrite (as N)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Nitrite/Nitrate Nitrogen	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Sulfate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Sulfide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon (TOC)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Iron	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Iron, Ferrous	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Fatty Acids (mg/L)													
Acetic Acid		-	-	-	-	-	-	-	-	-	-	-	-
Propionic Acid		-	-	-	-	-	-	-	-	-	-	-	-
Pyruvic Acid		-	-	-	-	-	-	-	-	-	-	-	-
Butyric Acid		-	-	-	-	-	-	-	-	-	-	-	-
Lactic Acid		-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Gases (ug/L)													
Ethane	ug/L	-	-	-	-	-	-	-	-	-	-	-	-
Ethene	ug/L	-	-	-	-	-	-	-	-	-	-	-	-
Methane	ug/L	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds (ug/L)													
1,1,2-Trichloroethane	ug/L	**4.5**	-	< 20	< 20	< 10	< 1	-	< 1	< 1	< 1	< 1	< 5
1,1-Dichloroethane		-	-	< 20	< 20	< 10	-	-	< 1	< 1	< 1	-	-
1,1-Dichloroethene	ug/L	**6.5**	-	-	**39**	**21**	< 1	-	-	< 1	< 1	< 1	< 5
cis-1,2-Dichloroethene	ug/L	**678**	**768**	**770**	**900**	**740**	< 1	< 1	< 1	< 1	< 1	< 1	< 5
Methylene chloride	ug/L	**23.6**	-	< 80	< 80	< 40	< 2	-	< 4	< 4	< 4	< 5	< 5
trans-1,2-Dichloroethene	ug/L	**29.2**	< 100	**33**	**51**	**40**	< 1	< 1	< 1	< 1	< 1	< 1	< 5
Trichloroethene	ug/L	**13100**	**16300**	**13000**	**13000**	**9000**	**11.8**	**7.6**	**8**	**5**	**6**	< 1	< 5
Vinyl chloride	ug/L	**2.1**	< 100	< 20	< 20	< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 2

Notes and Abbreviations:
1. Results shown in **bold** were detected.
2. < - Not detected above the laboratory detection limit.
3. Only detected compounds are shown in table.
4. - Not analyzed.

TABLE II
GROUNDWATER AND SURFACE WATER ANALYTICAL RESULTS
CARPENTER - GENERAL TIME FACILITY
ATHENS, GEORGIA

Location Name		SW-1	SW-1	SW-1	SW-2	SW-2	SW-2	SW-2	SW-2	S-2	S-5
Sample Date		9/18/2015	10/19/2016	3/8/2017	9/23/2013	10/13/2014	9/18/2015	10/19/2016	3/10/2017	12/27/2011	12/27/2011
Field Parameters	Units										
Conductivity	mS/cm	0.106	0.126	0.092	-	-	0.105	0.114	0.090	-	-
Dissolved Oxygen	mg/L	6.50	20.38	12.77	-	-	6.86	12.61	9	-	-
ORP	mV	-44	144	174	-	-	58	179	146	-	-
pH	s.u.	7.44	6.62	5.74	-	-	7.49	6.42	6.31	-	-
Temperature	°C	18.66	20.49	16.42	-	-	19.92	23.29	13	-	-
Turbidity	NTU	7.5	11.7	28.2	-	-	19.1	21.4	282	-	-
General Chemistry (mg/L)											
Alkalinity, Total (as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-
Nitrate	mg/L	-	-	-	-	-	-	-	-	-	-
Nitrite (as N)	mg/L	-	-	-	-	-	-	-	-	-	-
Nitrite/Nitrate Nitrogen	mg/L	-	-	-	-	-	-	-	-	-	-
Sulfate	mg/L	-	-	-	-	-	-	-	-	-	-
Sulfide	mg/L	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon (TOC)	mg/L	-	-	-	-	-	-	-	-	-	-
Iron	mg/L	-	-	-	-	-	-	-	-	-	-
Iron, Ferrous	mg/L	-	-	-	-	-	-	-	-	-	-
Volatile Fatty Acids (mg/L)											
Acetic Acid		-	-	-	-	-	-	-	-	-	-
Propionic Acid		-	-	-	-	-	-	-	-	-	-
Pyruvic Acid		-	-	-	-	-	-	-	-	-	-
Butyric Acid		-	-	-	-	-	-	-	-	-	-
Lactic Acid		-	-	-	-	-	-	-	-	-	-
Dissolved Gases (ug/L)											
Ethane	ug/L	-	-	-	-	-	-	-	-	-	-
Ethene	ug/L	-	-	-	-	-	-	-	-	-	-
Methane	ug/L	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds (ug/L)											
1,1,2-Trichloroethane	ug/L	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1	< 1
1,1-Dichloroethane		< 1	< 1	< 1	-	-	< 1	< 1	< 1	-	-
1,1-Dichloroethene	ug/L	-	< 1	< 1	< 1	< 5	-	< 1	< 1	< 1	< 1
cis-1,2-Dichloroethene	ug/L	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	**1.7**	< 1
Methylene chloride	ug/L	< 4	< 4	< 4	< 5	< 5	< 4	< 4	< 4	< 2	< 2
trans-1,2-Dichloroethene	ug/L	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1	< 1
Trichloroethene	ug/L	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	**13.1**	< 1
Vinyl chloride	ug/L	< 1	< 1	< 1	< 1	< 2	< 1	< 1	< 1	< 1	< 1

Notes and Abbreviations:
1. Results shown in **bold** were detected.
2. < - Not detected above the laboratory detection limit.
3. Only detected compounds are shown in table.
4. - Not analyzed.

TABLE III
POTENTIOMETRIC SURFACE DATA
CARPENTER - GENERAL TIME FACILITY
ATHENS, GEORGIA

Well Identifier	Date of Measurement	Time	Reference Point Elevation	Screened Interval (feet)	Depth to Water (feet)	Static Water Level Elevation (feet)	Notes
MW-1S	3/6/2017	1111	641.3	14.5 - 4.5	7.50	633.80	
MW-1I	3/6/2017	1113	641.1	25 - 20	7.36	633.74	
MW-2S	3/6/2017	1059	637.3	20 - 10	17.83	619.47	
MW-2I	3/6/2017	1100	637.4	86.5 - 76.5	18.83	618.57	
MW-2D	3/6/2017	1355	635.5	226.5 - 216.5	22.56	612.94	
MW-3I	3/6/2017	1115	639.7	99.5 - 89.5	16.74	622.96	
MW-5I	3/6/2017	1310	623.5	41.5 - 31.5	11.78	611.72	
MW-6I	3/6/2017	1313	622.8	71 - 61	10.00	612.80	
MW-7I	3/6/2017	1326	619.1	36.5 - 26.5	9.05	610.05	
MW-8I	3/6/2017	1322	618.7	15 - 5	10.07	608.63	
MW-9I	3/6/2017	1320	613.2	54.5 - 44.5	6.20	607.00	
MW-9D	3/6/2017	1319	613.4	201.4 - 181.4	11.28	602.12	
MW-11S	3/6/2017	1334	611.0	13 - 3	8.47	602.53	
MW-11I	3/6/2017	1333	610.9	32 - 22	8.37	602.53	
MW-11D	3/6/2017	1332	611.9	287.3 - 277.3	9.02	602.88	
MW-16I	3/6/2017	1057	643.6	30 - 20	20.56	623.04	
MW-16D	3/6/2017	1056	643.6	57 - 47	20.57	623.03	
RW-1	3/6/2017	1102	639.7	46.5 - 26.5	19.28	620.42	
RW-2	3/6/2017	1104	639.2	90 - 70	19.48	619.72	
RW-3	3/6/2017	1354	633.9	90 - 70	15.27	618.63	
RW-4	3/6/2017	1351	633.7	95 - 75	14.17	619.53	

TABLE IV
INJECTION GROUNDWATER MONITORING PARAMETERS
CARPENTER - GENERAL TIME FACILITY

Location Name		MW-16D	MW-16D	MW-16D	MW-16D	MW-16D	MW-16D	MW-16I	MW-16I	MW-16I	MW-16I	MW-16I	MW-16I
Sample Date		3/3/2016	4/20/2016	7/7/2016	9/7/2016	1/26/2017	3/9/2017	3/3/2016	4/20/2016	7/7/2016	9/7/2016	12/22/2016	1/26/2017
Field Parameters	Units												
Conductivity	mS/cm	0.112	0.109	0.114	0.103	0.118	0.115	0.771	24.9	7.5	5.19	2.97	2.33
Dissolved Oxygen	mg/L	1.93	1.15	1.78	1.59	2.41	2.59	0.00	0.00	0.19	0.6	1.54	1.72
ORP	mV	137	166	93	266	95	229	-13	-155	-128	-118	-73	-139
pH	s.u.	6.24	5.37	6.46	5.28	5.98	5.29	6.37	7.04	6.95	6.15	6.4	6.24
Temperature	°C	18.86	20.85	21.23	26.78	19.73	17.07	19.49	20.72	21.05	23.84	20.37	19.78
Turbidity	NTU	0.00	0.6	0.8	0	0.3	-	32.6	488	58.1	41.3	20.6	68.2
General Chemistry (mg/L)													
Alkalinity, Total (as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate	mg/L	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Nitrite (as N)	mg/L	-	-	-	-	-	-	**-**	**-**	**-**	**-**	-	-
Nitrite/Nitrate Nitrogen	mg/L	-	-	-	-	-	-	**-**	**-**	**-**	**-**	**-**	-
Sulfate	mg/L	**8.1**	**7.9**	**7.4**	**8.1**	**-**	**7.2**	**209**	**50**	< 5.0	< 5.0	< 5.0	**-**
Sulfide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon (TOC)	mg/L	< 1.0	1.2	< 1.0	1.0	-	< 1.0	**6.2**	**15200**	**2900**	**3020**	**746**	-
Iron	mg/L	-	-	< 0.200	< 0.200	-	< 0.200	-	-	**75.7**	**107**	**50.3**	-
Iron, Ferrous	mg/L	< 0.05	**0.095**	**0.088**	< 0.050	-	< 0.050	**2.5**	**63.8**	**78.9**	**122**	**55.1**	-
Volatile Fatty Acids (mg/L)													
Acetic Acid		**-**	< 5.0	**-**	**-**	**-**	< 5.0	-	< 500	**1900**	**2000**	**730**	**-**
Propionic Acid		**-**	< 5.0	**-**	**-**	**-**	< 5.0	-	< 500	**2200**	**2200**	**440**	**-**
Pyruvic Acid		**-**	< 5.0	**-**	**-**	**-**	< 5.0	-	< 500	< 25	< 50	< 10	**-**
Butyric Acid		**-**	< 5.0	**-**	**-**	**-**	< 5.0	-	< 500	**33**	**360**	**350**	**-**
Lactic Acid		**-**	< 10	**-**	**-**	**-**	< 5.0	-	**37000**	**2200**	**120**	< 20	**-**
Dissolved Gases (ug/L)													
Ethane	ug/L	-	-	-	-	-	< 5.0	-	-	-	-	-	-
Ethene	ug/L	-	-	-	-	-	< 5.0	-	-	-	-	-	-
Methane	ug/L	-	-	-	-	-	< 5.0	**-**	**-**	**-**	**-**	**-**	-
Volatile Organic Compounds (ug/L)													
1,1,2-Trichloroethane	ug/L	< 1.0	< 1.0	< 1.0	< 1	-	< 1	< 20	< 10	< 20	< 1	< 10	-
1,1-Dichloroethane		< 1.0	< 1.0	< 1.0	< 1	-	< 1	< 20	< 10	<20	**5**	< 10	-
1,1-Dichloroethene	ug/L	-	-	-	< 1	-	< 1	-	-	-	**12**	**14**	-
cis-1,2-Dichloroethene	ug/L	**37.0**	**35.0**	**38.0**	**43**	**49.9**	**50**	**13000**	**9000**	**20000**	**22000**	**16000**	**12151.5**
Methylene chloride	ug/L	< 4.0	< 4.0	< 4.0	< 4	-	< 4	< 80	< 40	< 80	< 4	< 40	-
trans-1,2-Dichloroethene	ug/L	< 1.0	< 1.0	< 1.0	< 1	-	< 1	**37**	**190**	**360**	**250**	**560**	-
Trichloroethene	ug/L	**110**	**120**	**110**	**110**	**126.2**	**130**	**19000**	**6200**	**3100**	**97**	< 10	ND
Vinyl chloride	ug/L	< 1.0	< 1.0	< 1.0	< 1	< 5.0	< 1	**440**	**75**	**240**	**110**	**2200**	**2581.1**

Notes and Abbreviations:

1. Results shown in **bold** were detected.
2. < - Not detected above the laboratory detection limit.
3. Only detected compounds are shown in table.
4. - Not analyzed.

TABLE IV
INJECTION GROUNDWATER MONITORING PARAMETERS
CARPENTER - GENERAL TIME FACILITY

Location Name		MW-16I	HAMP-3	HAMP-3	HAMP-3	HAMP-3	HAMP-3	HAMP-3	HAMP-7	HAMP-7	HAMP-7	HAMP-7	HAMP-7
Sample Date		3/9/2017	3/3/2016	4/20/2016	7/7/2016	9/7/2016	1/26/2017	3/9/2017	3/3/2016	4/20/2016	7/7/2016	9/7/2016	1/26/2017
Field Parameters	Units												
Conductivity	mS/cm	2.06	0.871	0.562	0.688	4.83	4.97	6.18	0.237	0.255	1.72	2.56	3.04
Dissolved Oxygen	mg/L	0.45	0.00	0.00	0.16	4.13	0.96	0.83	0	0	0.06	0.24	0.62
ORP	mV	-134	-151	-131	-171	-162	-166	-167	197	156	-107	-112	-178
pH	s.u.	6.46	7.69	7.24	8.42	6.77	6.93	7.05	6.00	5.39	6.85	6.29	6.65
Temperature	°C	17.31	18.27	20.46	20.19	23.39	19.70	17.81	20.03	20.69	18.08	26.26	20.37
Turbidity	NTU	1.68	37.9	11.8	11.1	16.0	16.9	-	8.6	16.3	40.6	17.6	82.7
General Chemistry (mg/L)													
Alkalinity, Total (as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Nitrite (as N)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Nitrite/Nitrate Nitrogen	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Sulfate	mg/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	-	< 5.0	**41.2**	**43.8**	**31.0**	**23.8**	-
Sulfide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon (TOC)	mg/L	**384**	**4.3**	**2**	**48.2**	**1900**	-	**2290**	**1.6**	**6.4**	**461**	**955**	-
Iron	mg/L	**35.8**	-	-	**0.654**	**42.90**	-	**47.00**	-	-	**33.6**	**79.2**	-
Iron, Ferrous	mg/L	**36.4**	**2.00**	**0.77**	**0.67**	**47.90**	-	**46.90**	< 0.05	**0.05**	**45.5**	**93.0**	-
Volatile Fatty Acids (mg/L)													
Acetic Acid		**420**	-	< 5.0	**12**	**2400**	-	**1400**	-	< 5.0	**280**	**530**	-
Propionic Acid		**170**	-	< 5.0	**84**	**3200**	-	**1700**	-	< 5.0	**370**	**650**	-
Pyruvic Acid		< 5.0	-	< 5.0	< 5.0	**< 50**	-	< 5.0	-	< 5.0	< 5.0	< 5.0	-
Butyric Acid		**120**	-	< 5.0	< 5.0	**110**	-	**100**	-	< 5.0	< 5.0	**81**	-
Lactic Acid		< 10.0	-	< 10	< 10	**160**	-	< 10	-	< 10	**320**	**340**	-
Dissolved Gases (ug/L)													
Ethane	ug/L	**6.5**	-	-	-	-	-	< 5.0	-	-	-	-	-
Ethene	ug/L	**3200**	-	-	-	-	-	**97**	-	-	-	-	-
Methane	ug/L	**2000**	-	-	-	-	-	**16000**	-	-	-	-	-
Volatile Organic Compounds (ug/L)													
1,1,2-Trichloroethane	ug/L	< 20	< 2.0	< 1.0	< 1.0	< 1.0	-	< 1.0	< 20	< 10	< 10	< 5.0	-
1,1-Dichloroethane		< 20	< 2.0	< 1.0	< 1.0	**1**	-	**1**	< 20	< 10	< 10	< 5.0	-
1,1-Dichloroethene	ug/L	< 20	-	-	-	**2**	-	< 1.0	-	-	-	**11**	-
cis-1,2-Dichloroethene	ug/L	**9100**	**410.0**	**270.0**	**350**	**1000**	**228.7**	**140**	**2100**	**2200**	**4800**	**6000**	**2397.7**
Methylene chloride	ug/L	< 80	< 8.0	< 4.0	< 4.0	< 4.0	-	< 4.0	< 80	< 40	< 40	< 20	-
trans-1,2-Dichloroethene	ug/L	**270**	< 2.0	**2**	**3**	**16**	-	**14**	< 20	**12**	**18**	**16**	-
Trichloroethene	ug/L	< 20	**92**	**19**	**7**	**6**	ND	< 1.0	**8500**	**9900**	**8800**	**4500**	**3703.4**
Vinyl chloride	ug/L	**950**	4	**3**	**4**	**17**	**13.4**	**15**	**48**	**33**	**53**	**50**	**114.6**

Notes and Abbreviations:

1. Results shown in **bold** were detected.
2. < - Not detected above the laboratory detection limit.
3. Only detected compounds are shown in table.
4. - Not analyzed.

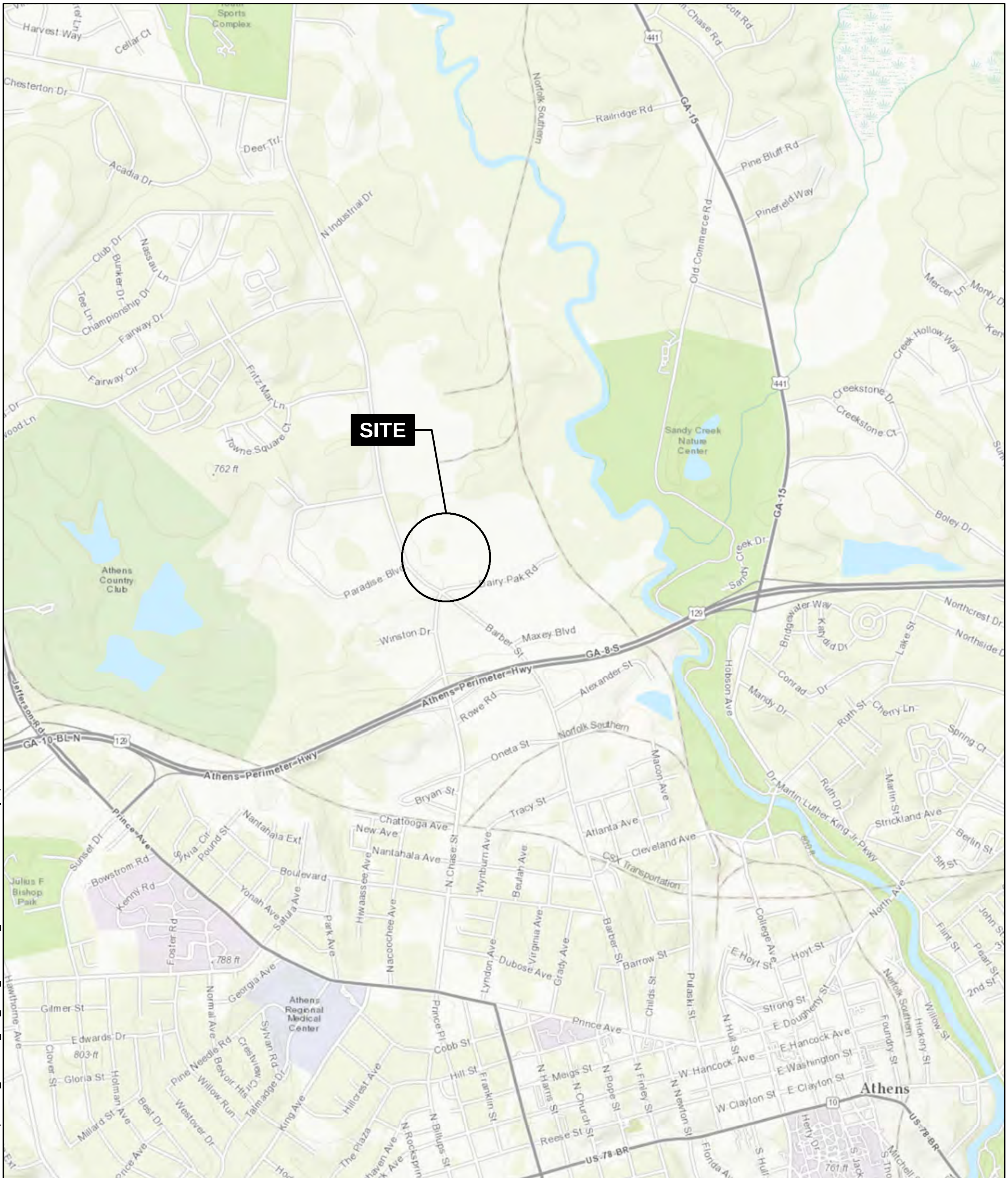
TABLE IV
INJECTION GROUNDWATER MONITORING PARAMETERS
CARPENTER - GENERAL TIME FACILITY

Location Name		HAMP-7	HAMP-8	HAMP-8	HAMP-8	HAMP-8	HAMP-8	HAMP-8
Sample Date		3/9/2017	3/3/2016	4/20/2016	7/7/2016	9/7/2016	1/26/2017	3/9/2017
Field Parameters	Units							
Conductivity	mS/cm	2	0.644	0.514	1.49	1.93	1.55	1.34
Dissolved Oxygen	mg/L	0.36	0	0	0.13	0.25	0.76	0.38
ORP	mV	-156	99	145	-75	-125	-167	-165
pH	s.u.	6.90	5.29	5.13	6.53	5.94	6.37	6.60
Temperature	°C	17.93	18.8	20.18	20.37	25.9	19.46	17.26
Turbidity	NTU	0.0	15.1	6.8	16.1	21.7	42.2	0.0
General Chemistry (mg/L)								
Alkalinity, Total (as CaCO3)	mg/L	-	-	-	-	-	-	-
Nitrate	mg/L	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Nitrite (as N)	mg/L	-	-	-	-	-	-	-
Nitrite/Nitrate Nitrogen	mg/L	-	-	-	-	-	-	-
Sulfate	mg/L	**25.2**	**152**	**139**	**91.9**	**30.0**	**-**	**5.4**
Sulfide	mg/L	-	-	-	-	-	-	-
Total Organic Carbon (TOC)	mg/L	**261**	**5.3**	**1**	**453**	**782**	-	**156**
Iron	mg/L	**33.8**	-	-	**11.6**	**61.3**	-	**14.7**
Iron, Ferrous	mg/L	**29.7**	**1.3**	**0.05**	**14.7**	**74.8**	-	**12.4**
Volatile Fatty Acids (mg/L)								
Acetic Acid		**170**	-	< 5.0	**170**	**710**	**-**	**240**
Propionic Acid		**350**	-	< 5.0	**120**	**520**	**-**	**58**
Pyruvic Acid		< 5.0	-	< 5.0	< 5.0	< 5.0	**-**	< 5.0
Butyric Acid		**74**	-	< 5.0	**19**	**39**	**-**	< 5.0
Lactic Acid		< 10	-	35	**760**	**350**	**-**	< 10
Dissolved Gases (ug/L)								
Ethane	ug/L	< 5.0	-	-	-	-	-	< 5.0
Ethene	ug/L	**310**	-	-	-	-	-	< 5.0
Methane	ug/L	**7500**	-	-	-	-	-	**110**
Volatile Organic Compounds (ug/L)								
1,1,2-Trichloroethane	ug/L	< 2	57	< 100	< 20	< 20	-	< 50
1,1-Dichloroethane		< 2	< 50	< 100	< 20	< 20	-	< 50
1,1-Dichloroethene	ug/L	**6**	-	-	-	< 20	-	< 50
cis-1,2-Dichloroethene	ug/L	**2900**	**3200**	**3000**	**4000**	**8700**	**18419.8**	**27000**
Methylene chloride	ug/L	< 8	< 200	< 400	< 80	< 80	-	< 200
trans-1,2-Dichloroethene	ug/L	**17**	< 50	< 100	**120**	**200**	-	**98**
Trichloroethene	ug/L	**6300**	**27000**	**30000**	**26000**	**18000**	**3650**	**760**
Vinyl chloride	ug/L	**130**	< 50	< 100	**25**	< 20	ND	< 50

Notes and Abbreviations:

1. Results shown in **bold** were detected.
2. < - Not detected above the laboratory detection limit.
3. Only detected compounds are shown in table.
4. - Not analyzed.

FIGURES



MAP SOURCE: ESRI
USGS QUAD: ATHENS WEST
SITE COORDINATES: 82°23'13"N,33°58'50"

HALEY ALDRICH

GENERAL TIME FACILITY
ATHENS, GEORGIA

SITE LOCATION MAP

APPROXIMATE SCALE: 1 IN = 2000 FT
OCTOBER 2016

FIGURE 1

GIS FILE PATH: C:\ajospe\projects\38111\Global\GIS\Maps\2015_09\38111_000_0001_PROJECT_LOCUS.mxd — USER: ajospe — LAST SAVED: 10/10/2016 6:56:04 PM

ABB-WESTINGHOUSE

SOUTHERN RAILROAD

NEWTON BRIDGE ROAD

FORMER GENERAL TIME FACILITY

MW-1S

MW-1I

FORMER COOLING TOWER AREA

RW-1

RW-2

MW-2I

MW-2S

MW-2D

MW-16D

FORMER VAPOR DEGREASER AREA

FORMER CISTERN AREA

RW-3

MW-16I

RW-4

FORMER CENTRIFUGE AREA

1992 TCE SPILL EXCAVATION AREA

GEORGIA POWER COMPANY

MW-4I

MW-5I

MW-7I

MW-6I

MW-3I

CHAMPION DAIRY PAK

MW-8I

MW-9D

MW-9I

NORTHEAST SALES

ATHENES SEED

PEEL CO. INC.

MW-13I

MW-10IR

MW-10D

BARBER STREET

CHASE STREET

ATHENES PERIMETER

MW-14I

MW-14D

SW-1

MW-11I

MW-11D

MW-11S

EVIDENCE OF DUMPING

MW-12I

MW-12D

SW-2

MW-15I

LEGEND

- NORTH OCONEE RIVER SURFACE WATER SAMPLING LOCATION
- SHALLOW MONITORING WELL
- INTERMEDIATE MONITORING WELL
- DEEP MONITORING WELL
- RECOVERY MONITORING WELL
- STREAM
- RAILROAD

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: ESRI

N

0 400 800

SCALE IN FEET

HALEY ALDRICH

GENERAL TIME FACILITY
ATHENS, GEORGIA

SITE MAP SHOWING SAMPLE LOCATIONS AND SUSPECTED SOURCE AREAS

OCTOBER 2016

FIGURE 2

ABB-WESTINGHOUSE

SOUTHERN RAILROAD

NEWTON BRIDGE ROAD

FORMER GENERAL TIME FACILITY

CHAMPION DAIRY PAK

GEORGIA POWER COMPANY

NORTHEAST SALES

ATHENS STEEL

PEEL CO. INC.

BARBER STREET

CHASE STREET

ATHENES PERIMETER

MW-1S
MW-1I
633.74

MW-2I
618.57

MW-16I
623.04

RW-4

MW-3I
622.96

MW-4I

MW-5I
611.72

MW-6I
612.80

MW-7I
610.05

MW-8I
608.63

MW-9D
MW-9I
607.00

MW-10IR
615.00
MW-10D

MW-11S
MW-11D
MW-11I
602.53

MW-12I
610.30

MW-13I
608.40

MW-14I
615.00

MW-15I
596.50

SW-1

635
630
625
620
615
610
605
600

LEGEND

- INTERMEDIATE MONITORING WELL WITH ID AND GROUNDWATER ELEVATION INDICATED IN FEET ABOVE MEAN SEA LEVEL (WHERE SAMPLED)
- NORTH OCONEE RIVER SURFACE WATER SAMPLING LOCATION
- SHALLOW MONITORING WELL
- DEEP MONITORING WELL
- RECOVERY MONITORING WELL
- GROUNDWATER ELEVATION CONTOUR, IN FEET ABOVE MEAN SEA LEVEL, 2-FT INTERVAL
- STREAM
- RAILROAD

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: ESRI

N

0 400 800
SCALE IN FEET

HALEY ALDRICH

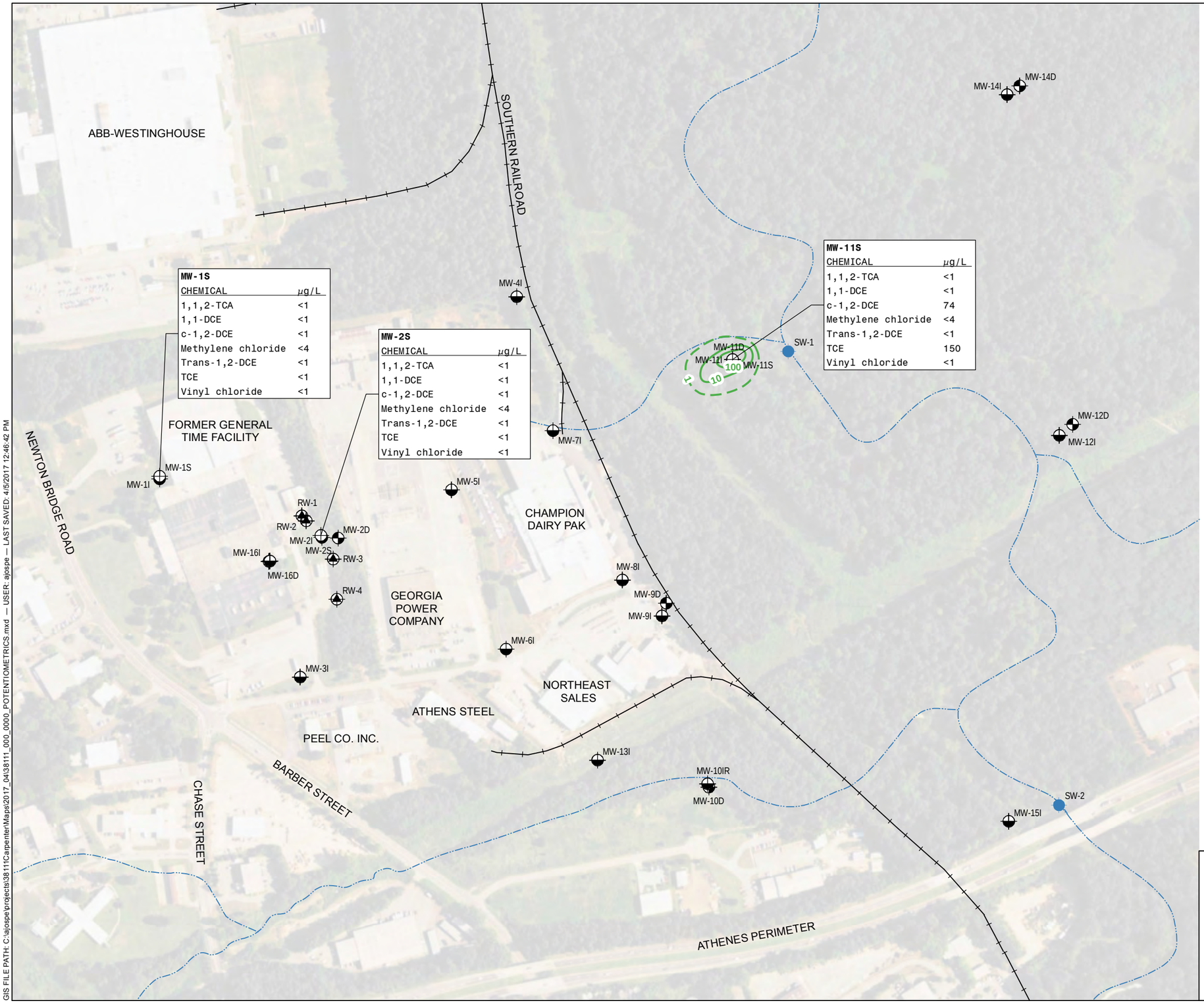
GENERAL TIME FACILITY
ATHENS, GEORGIA

POTENTIOMETRIC SURFACE MARCH 2017

MARCH 2017

FIGURE 3

GIS FILE PATH: G:\38111_Carpenter\Global\GIS\Maps\2017_03\38111_000_0000_POTENTIOMETRICS.mxd — USER: ajospe — LAST SAVED: 3/28/2017 9:11:32 AM



LEGEND

- NORTH OCONEE RIVER SURFACE WATER SAMPLING LOCATION
- SHALLOW MONITORING WELL
- INTERMEDIATE MONITORING WELL
- DEEP MONITORING WELL
- RECOVERY MONITORING WELL
- TCE ISOCONCENTRATION CONTOUR µg/L, DASHED WHERE INFERRED
- STREAM
- RAILROAD

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

2. ACRONYMS:
   1,1,2-TCE = 1,1,2-TRICHLOROETHANE
   1,1-DCE = 1,1-DICHLOROETHENE
   c-1,2-DCE = cis-1,2-DICHLOROETHENE
   trans-1,2-DCE = trans-1,2-DICHLOROETHENE
   TCE = TRICHLOROETHENE
   VC = VINYL CHLORIDE

4. AERIAL IMAGERY SOURCE: ESRI

N

0 400 800
SCALE IN FEET

HALEY ALDRICH

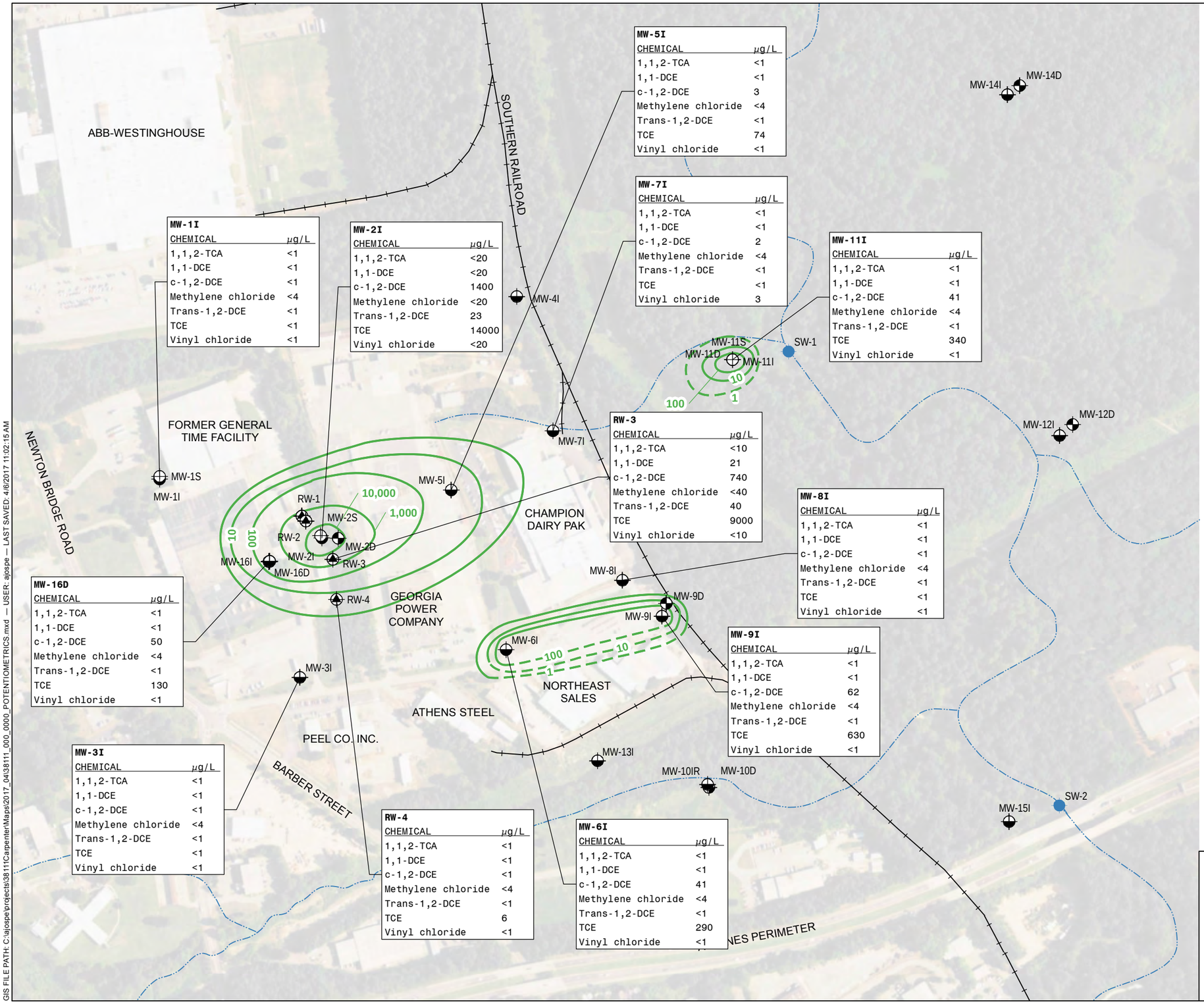
GENERAL TIME FACILITY
ATHENS, GEORGIA

DISTRIBUTION OF TCE IN SHALLOW GROUNDWATER MARCH 2017

APRIL 2017

FIGURE 4

GIS FILE PATH: C:\ajospe\projects\38111\Carpenter\Maps\2017_04\38111_000_0000_POTENTIOMETRICS.mxd — USER: ajospe — LAST SAVED: 4/5/2017 12:46:42 PM



LEGEND

- NORTH OCONEE RIVER SURFACE WATER SAMPLING LOCATION
- SHALLOW MONITORING WELL
- INTERMEDIATE MONITORING WELL
- DEEP MONITORING WELL
- RECOVERY MONITORING WELL
- TCE ISO-CONCENTRATION CONTOUR µg/L (DASHED WHERE INFERRED)
- STREAM
- RAILROAD

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

2. ACRONYMS:
   1,1,2-TCE = 1,1,2-TRICHLOROETHANE
   1,1-DCE = 1,1-DICHLOROETHENE
   c-1,2-DCE = cis-1,2-DICHLOROETHENE
   t-1,2-DCE = trans-1,2-DICHLOROETHENE
   TCE = TRICHLOROETHENE
   VC = VINYL CHLORIDE

3. AERIAL IMAGERY SOURCE: ESRI

N

0 400 800
SCALE IN FEET

HALEY ALDRICH

GENERAL TIME FACILITY
ATHENS, GEORGIA

DISTRIBUTION OF TCE IN INTERMEDIATE GROUNDWATER MARCH 2017

APRIL 2017

FIGURE 5

LEGEND

- BASELINE AND POST-REMEDIATION MONITORING WELL LOCATION
- INJECTION POINT LOCATION
- SHALLOW MONITORING WELL
- INTERMEDIATE MONITORING WELL
- DEEP MONITORING WELL
- RECOVERY MONITORING WELL
- TCE ISO-CONCENTRATION CONTOUR IN µg/L (JULY 2011)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: ESRI

N

0 80 160
SCALE IN FEET

HALEY ALDRICH

GENERAL TIME FACILITY
ATHENS, GEORGIA

INJECTION POINTS AND BASELINE POST-REMEDIATION MONITORING WELLS

OCTOBER 2016

FIGURE 6

GIS FILE PATH: G:\38111_Carpenter\Global\GIS\Maps\2016_10\38111_000_0000_INJECTION_POINTS.mxd — USER: ajospe — LAST SAVED: 9/30/2016 8:28:01 AM

FIGURE 7
PROJECT MILESTONE SCHEDULE
GENERAL TIME FACILITY ATHENS GEORGIA

No.	TASK	2013				2014				2015				2016				2017				2018			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1	VRP Application Submittal																								
2	Delineation	MPLETE																							
3	Semiannual Groundwater and Surface Water Sampling																								
5	Supplemental Remedial Activities																								
6	Semiannual Reporting																								
7	Compliance Status Report Submittal																								

NOTES: VRP application was approved on April 16, 2014
October Semiannual Progress Report Submittals include the annual groundwater and surface water sampling and anlaysis

APPENDIX A

Analytical Report

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Analysis Report

REVISED

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

Report Date: November 02, 2016

Project: Former General Time

Submittal Date: 10/21/2016
Group Number: 1723999
PO Number: 128752-002
State of Sample Origin: GA

Client Sample Description	Lancaster Labs (LL) #
SW-1 Grab Groundwater	8657354
SW-2 Grab Groundwater	8657355
Trip Blank Water	8657356

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ . To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	Haley Aldrich	Attn: Shawn Lewis
Electronic Copy To	Carpenter Technology Corp.-PA	Attn: Mike Reichardt
Electronic Copy To	Carpenter Technology Corp.	Attn: Ann Kalbach

Respectfully Submitted,

Lyssa M. Longenecker
Specialist

(717) 556-7321

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Analysis Report

REVISED

Sample Description: SW-1 Grab Groundwater
Carpenter Site - Athens, GA

LL Sample # WW 8657354
LL Group # 1723999
Account # 00435

Project Name: Former General Time

Collected: 10/19/2016 11:54 by SL

Submitted: 10/21/2016 09:45
Reported: 11/02/2016 14:11

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

SW-1-

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	1,1-Dichloroethane	75-34-3	< 1	1	1
10335	1,1-Dichloroethene	75-35-4	< 1	1	1
10335	cis-1,2-Dichloroethene	156-59-2	< 1	1	1
10335	trans-1,2-Dichloroethene	156-60-5	< 1	1	1
10335	Methylene Chloride	75-09-2	< 4	4	1
10335	1,1,2-Trichloroethane	79-00-5	< 1	1	1
10335	Trichloroethene	79-01-6	< 1	1	1
10335	Vinyl Chloride	75-01-4	< 1	1	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	W163011AA	10/27/2016 16:16	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	W163011AA	10/27/2016 16:16	Angela D Sneeringer	1

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Analysis Report

REVISED

Sample Description: SW-2 Grab Groundwater
Carpenter Site - Athens, GA

LL Sample # WW 8657355
LL Group # 1723999
Account # 00435

Project Name: Former General Time

Collected: 10/19/2016 13:04 by SL

Submitted: 10/21/2016 09:45
Reported: 11/02/2016 14:11

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

SW-2-

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	1,1-Dichloroethane	75-34-3	< 1	1	1
10335	1,1-Dichloroethene	75-35-4	< 1	1	1
10335	cis-1,2-Dichloroethene	156-59-2	< 1	1	1
10335	trans-1,2-Dichloroethene	156-60-5	< 1	1	1
10335	Methylene Chloride	75-09-2	< 4	4	1
10335	1,1,2-Trichloroethane	79-00-5	< 1	1	1
10335	Trichloroethene	79-01-6	< 1	1	1
10335	Vinyl Chloride	75-01-4	< 1	1	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	W163011AA	10/27/2016 16:40	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	W163011AA	10/27/2016 16:40	Angela D Sneeringer	1

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Analysis Report

REVISED

Sample Description: Trip Blank Water
Carpenter Site - Athens, GA

LL Sample # WW 8657356
LL Group # 1723999
Account # 00435

Project Name: Former General Time

Collected: 10/19/2016 13:04

Submitted: 10/21/2016 09:45
Reported: 11/02/2016 14:11

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

TBATH

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	1,1-Dichloroethane	75-34-3	< 1	1	1
10335	1,1-Dichloroethene	75-35-4	< 1	1	1
10335	cis-1,2-Dichloroethene	156-59-2	< 1	1	1
10335	trans-1,2-Dichloroethene	156-60-5	< 1	1	1
10335	Methylene Chloride	75-09-2	< 4	4	1
10335	1,1,2-Trichloroethane	79-00-5	< 1	1	1
10335	Trichloroethene	79-01-6	< 1	1	1
10335	Vinyl Chloride	75-01-4	< 1	1	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	W163011AA	10/27/2016 15:52	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	W163011AA	10/27/2016 15:52	Angela D Sneeringer	1

REVISED

Quality Control Summary

Client Name: Carpenter Technology Corp.-PA Group Number: 1723999
Reported: 11/02/2016 14:11

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result ug/l	LOQ ug/l
Batch number: W163011AA	Sample number(s): 8657354-8657356	
1,1-Dichloroethane	< 1	1
1,1-Dichloroethene	< 1	1
cis-1,2-Dichloroethene	< 1	1
trans-1,2-Dichloroethene	< 1	1
Methylene Chloride	< 4	4
1,1,2-Trichloroethane	< 1	1
Trichloroethene	< 1	1
Vinyl Chloride	< 1	1

LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: W163011AA	Sample number(s): 8657354-8657356								
1,1-Dichloroethane	20	20.75			104		80-120		
1,1-Dichloroethene	20	20.4			102		76-124		
cis-1,2-Dichloroethene	20	21.25			106		80-120		
trans-1,2-Dichloroethene	20	21.62			108		80-120		
Methylene Chloride	20	20.42			102		80-120		
1,1,2-Trichloroethane	20	20.35			102		80-120		
Trichloroethene	20	21.33			107		80-120		
Vinyl Chloride	20	15.45			77		63-121		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: W163011AA	Sample number(s): 8657354-8657356 UNSPK: P654045									
1,1-Dichloroethane	< 50	1000	1172.23	1000	1103.59	117	110	80-120	6	30

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

REVISED

Quality Control Summary

Client Name: Carpenter Technology Corp.-PA Group Number: 1723999
Reported: 11/02/2016 14:11

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
1,1-Dichloroethene	< 50	1000	1166.41	1000	1178.68	117	118	76-124	1	30
cis-1,2-Dichloroethene	< 50	1000	1143.74	1000	1136.69	114	114	80-120	1	30
trans-1,2-Dichloroethene	< 50	1000	1211.48	1000	1209.09	121*	121*	80-120	0	30
Methylene Chloride	< 200	1000	1081.15	1000	1068.49	108	107	80-120	1	30
1,1,2-Trichloroethane	< 50	1000	1050.3	1000	1043.06	105	104	80-120	1	30
Trichloroethene	< 50	1000	1176.21	1000	1184.3	118	118	80-120	1	30
Vinyl Chloride	< 50	1000	926.38	1000	906.06	93	91	63-121	2	30

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: VOCs- 5ml Water by 8260B
Batch number: W163011AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8657354	101	103	98	92
8657355	100	104	100	92
8657356	99	102	98	91
Blank	100	104	97	91
LCS	101	101	101	98
MS	101	107	100	98
MSD	101	103	99	97
Limits:	80-116	77-113	80-113	78-113

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Environmental Analysis Request/Chain of Custody

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For Eurofins Lancaster Laboratories Environmental use only

Acct. # 435 Group # 1773999 Sample # 8657354-56

COC # 513197

Client Information

Client: Haley and Aldrich	Acct. #:
Project Name/#: Former General Time	PWSID #:
Project Manager: Nagi, Alla	P.O. #: 128752-002 (new)
Sampler: Sean Lewis	Quote #:
State where samples were collected: GA	For Compliance: Yes ☐ No ☐

Matrix

Soil ☐ Sediment ☐ Tissue ☐ Water ☒ Potable ☐ Ground ☐ NPDES ☐ Surface ☐ Other: ____

Analysis Requested

Preservation Codes

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	#	VOCs*
SW-1	10-19-16	1159	X		3		
SW-2	10-19-16	1304	X		3		
TB	10-19-16	1301	X		2		

For Lab Use Only

FSC: ____

SCR#: 196302

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks

* Site specific COCs
Please make sure
to report 1-1DCE
Not 1-1 DCA

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: ____

E-mail address: ____

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
Edwin Hernandez	10/17/16	1130	Sean Lewis	10-18-16	1400
Sean Lewis	10-20-16	1000			

EDD Required? Yes No

If yes, format: ____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS ____ FedEx ____ Other ____

Temperature upon receipt 0.6 °C

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Sample Administration Receipt Documentation Log

Doc Log ID: 165966

Group Number(s): 1723999

Client: Haley & Aldrich

Delivery and Receipt Information

Delivery Method:	Fed Ex	Arrival Timestamp:	10/21/2016 9:45
Number of Packages:	1	Number of Projects:	1
State/Province of Origin:	GA		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	2
Paperwork Enclosed:	Yes	Trip Blank Type:	HCL
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Joseph Huber (7831) at 12:01 on 10/21/2016

Samples Chilled Details

Thermometer Types: *DT = Digital (Temp. Bottle)* *IR = Infrared (Surface Temp)* *All Temperatures in °C.*

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	0.6	DT	Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425
T | 717-656-2300
F | 717-656-2681
www.LancasterLabs.com

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	milliliter(s)
cfu	colony forming units	**MPN**	Most Probable Number
CP Units	cobalt-chloroplatinate units	**N.D.**	none detected
F	degrees Fahrenheit	**ng**	nanogram(s)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…
W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

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

January 3, 2017

D McDonnell
Haley & Aldrich
400 Augusta St
Suite 130
Greenville, SC 29601

RE: **FORMER GENERAL TIME**

Pace Workorder: *21402*

Dear D McDonnell:

Enclosed are the analytical results for sample(s) received by the laboratory on Friday, December 23, 2016. 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,

Ruth Welsh 01/03/2017
Ruth.Welsh@pacelabs.com

Customer Service Representative

Enclosures

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

Total Number of Pages 12

CERTIFICATE OF ANALYSIS

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:	West Virginia Department of Environmental Protection, Division of Water and Waste Management
Accreditation ID:	395
Scope:	Non-Potable Water
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: 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, PAES is accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

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

SAMPLE SUMMARY

Workorder: 21402 FORMER GENERAL TIME

Lab ID	Sample ID	Matrix	Date Collected	Date Received
214020001	MW-16I	Water	12/22/2016 11:39	12/23/2016 11:25

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

PROJECT SUMMARY

Workorder: 21402 FORMER GENERAL TIME

Batch Comments

Batch: EDON/3212 - Volatile Fatty Acids

The matrix spike and/or spike duplicate, recovery or relative percent difference; accuracy influenced by the concentration of the reference sample 213870001. Analyte Acetic acid. Batch acceptance based on laboratory control sample recovery.

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220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 21402 FORMER GENERAL TIME

Lab ID: **214020001** Date Received: 12/23/2016 11:25 Matrix: Water

Sample ID: **MW-16I** Date Collected: 12/22/2016 11:39

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
EDonors - PAES								
Analysis Desc: AM21G		Analytical Method: AM21G						
Acetic Acid	**730**	mg/l	10	0.66	2	12/29/2016 20:40	BW	d,M3,n,M5
Propionic Acid	**440**	mg/l	10	0.10	2	12/29/2016 20:40	BW	d,n
Pyruvic Acid	**<10**	mg/l	10	0.29	2	12/29/2016 20:40	BW	d,n
Butyric Acid	**350**	mg/l	10	0.11	2	12/29/2016 20:40	BW	d,n
Lactic Acid	**<20**	mg/l	20	2.0	2	12/29/2016 20:40	BW	d,n

CERTIFICATE OF ANALYSIS

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

ANALYTICAL RESULTS QUALIFIERS

Workorder: 21402 FORMER GENERAL TIME

DEFINITIONS/QUALIFIERS

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).
n	The laboratory does not hold NELAP/TNI accreditation for this method or analyte.
d	The analyte concentration was determined from a dilution.
M5	The matrix spike duplicate sample recovery was outside laboratory control limits.
M3	The matrix spike sample recovery was outside laboratory control limits.

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Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

QUALITY CONTROL DATA

Workorder: 21402 FORMER GENERAL TIME

QC Batch: EDON/3212 Analysis Method: AM21G

QC Batch Method: AM21G

Associated Lab Samples: 214020001

METHOD BLANK: 46331

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
EDonors				
Acetic Acid	mg/l	<5.0	5.0	M3,n,M5
Propionic Acid	mg/l	<5.0	5.0	n
Pyruvic Acid	mg/l	<5.0	5.0	n
Butyric Acid	mg/l	<5.0	5.0	n
Lactic Acid	mg/l	<10	10	n

LABORATORY CONTROL SAMPLE: 46332

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
EDonors						
Acetic Acid	mg/l	100	100	100	70-130	M3,n,M5
Propionic Acid	mg/l	100	100	101	70-130	n
Pyruvic Acid	mg/l	100	98	98	70-130	n
Butyric Acid	mg/l	100	100	105	70-130	n
Lactic Acid	mg/l	100	110	110	70-130	n

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 46333 46334 Original: 213870001

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
EDonors											
Acetic Acid	mg/l	700	200	840	820	67	60	70-130	11	20	d,M3,n,M5
Propionic Acid	mg/l	78	200	280	270	101	98	70-130	3	20	d,n
Pyruvic Acid	mg/l	0	200	200	200	102	101	70-130	0.99	20	d,n
Butyric Acid	mg/l	12	200	230	230	110	107	70-130	2.8	20	d,n
Lactic Acid	mg/l	0	200	220	230	113	113	70-130	0	20	d,n

CERTIFICATE OF ANALYSIS

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

QUALITY CONTROL DATA QUALIFIERS

Workorder: 21402 FORMER GENERAL TIME

QUALITY CONTROL PARAMETER QUALIFIERS

M3	The matrix spike sample recovery was outside laboratory control limits.
M5	The matrix spike duplicate sample recovery was outside laboratory control limits.
d	The analyte concentration was determined from a dilution.
n	The laboratory does not hold NELAP/TNI accreditation for this method or analyte.

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: 21402 FORMER GENERAL TIME

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
214020001	MW-16I			AM21G	EDON/3212

Pace Analytical®
www.pacelabs.com

220 William Pitt Way
Pittsburgh, PA 15238
412-826-5245

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

21402

Page: 1 of 1

007143

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Haley and Aldrich	Report To: dallal@haleyaldrich.com	Attention: Same as client
Address: 400 Augusta Street, St 430 Greenville, SC 29601	Copy To: mimiesfelt@haleyaldrich.com	Company Name:
Email To: dallal@haleyaldrich.com	Purchase Order No.: 38111-011	Address: Pace Quote Reference:
Phone: Fax:	Project Name: Former General Time	Pace Project Manager:
Requested Due Date/TAT: Standard	Project Number:	Pace Profile #:

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER
UST RCRA OTHER _____

Site Location STATE: GA

Requested Analysis Filtered (Y/N)

Section D Required Client Information

Matrix Codes MATRIX / CODE

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	TSP	BAK	Zinc Acetate & NaOH	Other	Analysis Test: VFAs	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-16I	WT	G			12/22	1139		2						X			X		
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	H+A	2/22/16	1300	PACE	12/23	1125	2.2	Y	N	Y

2

SAMPLER NAME AND SIGNATURE				
PRINT Name of SAMPLER:				
SIGNATURE of SAMPLER:	DATE Signed (MM/DD/YY):	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

NON-CONFORMANCE FORM

PAES Work Order #: 21402

Date: 12.23.16 Time of Receipt: _____ Receiver: LY

Client: Amec

REASON FOR NON-CONFORMANCE:

Sample was BAK preserved.

ACTION TAKEN:

Client name: _____ Date: _____ Time: _____

OK to proceed

Customer Service Initials: RW Date: 12-23-16

Cooler Receipt Form

Client Name: Haley & Aldrich Project: Frm General Tire Lab Work Order: 21402

A. Shipping/Container Information (circle appropriate response)

Courier: (FedEx) UPS USPS Client Other:_____ Air bill Present: (Yes) No

Tracking Number: 810252856560

Custody Seal on Cooler/Box Present: Yes (No) Seals Intact: Yes No

Cooler/Box Packing Material: (Bubble Wrap) Absorbent Foam Other:_____

Type of Ice: (Wet) Blue None Ice Intact: (Yes) Melted

Cooler Temperature: 2.2°C Radiation Screened: Yes (No) Chain of Custody Present: (Yes) No

Comments:_____

B. Laboratory Assignment/Log-in (check appropriate response)

	YES	NO	N/A	Comment Reference non-Conformance
Chain of Custody properly filled out	✓			
Chain of Custody relinquished	✓			
Sampler Name & Signature on COC		✓		
Containers intact	✓			
Were samples in separate bags			✓	
Sample container labels match COC Sample name/date and time collected	✓			
Sufficient volume provided	✓			
PAES containers used	✓			
Are containers properly preserved for the requested testing? (as labeled)	✓			
If an unknown preservation state, were containers checked? Exception: VOA's coliform			✓	If yes, see pH form.
Was volume for dissolved testing field filtered, as noted on the COC? Was volume received in a preserved container?			✓	

Comments:_____

Cooler contents examined/received by: LS Date: 12.23.16

Project Manager Review: RW Date: 12-23-16

Carpenter Technology Corporation
Chemical Technology Group

CARPENTER

Chemical Analysis Report

Sample ID	***E27532***	**Requestor**	*Sean McGowan*
Copies			

Sample Information

Description	MW-16I		
Location	Athens, GA - Former General Time		
Code	M-WA-WELL-XXXXXX		
Requestor ID	MW-16I		
Sampled	01/26/2017	**Time**	0847
Submitted	01/27/2017		
Reported	01/31/2017		
Taken by	Sean Lewis		
Method	Grab		
Volume	3x40mL		
Comments			
Cooler Rec'd at 6 deg C.			

This analysis report was reviewed and approved by: T. Oswalt

Carpenter Technology Corporation
R&D Chemical Laboratory
Volatile Organics Analysis Report

Sample Name:	MW-16I		
Data File Name:	E27532.D	**Date Received:**	
Analysis Date:	01/27/17	**Sample Wt/Vol:**	5 ml
Dilution Factor:	200	**Moisture Content:**	100 %
Operator:	MMB	**GC/MS Column:**	DB-VRX

Compound Name	Analysis Result	Units	Data Qualifiers	Limit of Quantitation
Vinyl chloride	2581.1	ug/L	D	1000.0
cis-1,2-Dichloroethene	12151.5	ug/L	D	1000.0
Trichloroethene	N.D.	ug/L		1000.0

GC/MS analysis performed using EPA Method 624

Limit of Quantitation adjusted based upon sample dilution factor.

Data Qualifiers:

B	Analyte also detected in blank	J	Estimated Value
D	Compound quantitated on diluted sample	N.D.	None Detected
E	Concentration exceeded the calibration range of the instrument		

Carpenter Technology Corporation
Chemical Technology Group

CARPENTER

Chemical Analysis Report

Sample ID	***E27533***	**Requestor**	*Sean McGowan*
Copies			

Sample Information

Description	MW-16D		
Location	Athens, GA - Former General Time		
Code	M-WA-WELL-XXXXXX		
Requestor ID	MW-16D		
Sampled	01/26/2017	**Time**	0927
Submitted	01/27/2017		
Reported	01/31/2017		
Taken by	Sean Lewis		
Method	Grab		
Volume	3x40mL		
Comments			
Cooler Rec'd at 6 deg C.			

This analysis report was reviewed and approved by: Tim Oswald

Carpenter Technology Corporation
R&D Chemical Laboratory
Volatile Organics Analysis Report

Sample Name:	MW-16D		
Data File Name:	E27533.D	**Date Received:**	
Analysis Date:	01/27/17	**Sample Wt/Vol:**	5 ml
Dilution Factor:	1	**Moisture Content:**	100 %
Operator:	MMB	**GC/MS Column:**	DB-VRX

Compound Name	Analysis Result	Units	Data Qualifiers	Limit of Quantitation
Vinyl chloride	N.D.	ug/L		5.0
cis-1,2-Dichloroethene	49.9	ug/L		5.0
Trichloroethene	126.2	ug/L		5.0

GC/MS analysis performed using EPA Method 624

Limit of Quantitation adjusted based upon sample dilution factor.

Data Qualifiers:

B	Analyte also detected in blank	J	Estimated Value
D	Compound quantitated on diluted sample	N.D.	None Detected
E	Concentration exceeded the calibration range of the instrument		

Carpenter Technology Corporation
Chemical Technology Group

CARPENTER

Chemical Analysis Report

Sample ID	***E27534***	**Requestor**	*Sean McGowan*
Copies			

Sample Information

Description	MP-3		
Location	Athens, GA - Former General Time		
Code	M-WA-WELL-XXXXXX		
Requestor ID	MP-3		
Sampled	01/26/2017	**Time**	1020
Submitted	01/27/2017		
Reported	01/31/2017		
Taken by	Sean Lewis		
Method	Grab		
Volume	3x40mL		
Comments			
Cooler Rec'd at 6 deg C.			

This analysis report was reviewed and approved by: Tim Oswald

Carpenter Technology Corporation
R&D Chemical Laboratory
Volatile Organics Analysis Report

Sample Name:	MP-3		
Data File Name:	E27534.D	**Date Received:**	
Analysis Date:	01/27/17	**Sample Wt/Vol:**	5 ml
Dilution Factor:	10	**Moisture Content:**	100 %
Operator:	MMB	**GC/MS Column:**	DB-VRX

Compound Name	Analysis Result	Units	Data Qualifiers	Limit of Quantitation
Vinyl chloride	13.4	ug/L	JD	50.0
cis-1,2-Dichloroethene	228.7	ug/L	D	50.0
Trichloroethene	N.D.	ug/L		50.0

GC/MS analysis performed using EPA Method 624

Limit of Quantitation adjusted based upon sample dilution factor.

Data Qualifiers:

B	Analyte also detected in blank	J	Estimated Value
D	Compound quantitated on diluted sample	N.D.	None Detected
E	Concentration exceeded the calibration range of the instrument		

Carpenter Technology Corporation
Chemical Technology Group

CARPENTER

Chemical Analysis Report

Sample ID	***E27535***	**Requestor**	*Sean McGowan*
Copies			

Sample Information

Description	MP-8		
Location	Athens, GA - Former General Time		
Code	M-WA-WELL-XXXXXX		
Requestor ID	MP-8		
Sampled	01/26/2017	**Time**	1112
Submitted	01/27/2017		
Reported	01/31/2017		
Taken by	Sean Lewis		
Method	Grab		
Volume	3x40mL		
Comments			
Cooler Rec'd at 6 deg C.			

This analysis report was reviewed and approved by: Tim Ogonek

Carpenter Technology Corporation
R&D Chemical Laboratory
Volatile Organics Analysis Report

Sample Name:	MP-8		
Data File Name:	E27535.D	**Date Received:**	
Analysis Date:	01/27/17	**Sample Wt/Vol:**	5 ml
Dilution Factor:	200	**Moisture Content:**	100 %
Operator:	MMB	**GC/MS Column:**	DB-VRX

Compound Name	Analysis Result	Units	Data Qualifiers	Limit of Quantitation
Vinyl chloride	N.D.	ug/L		1000.0
cis-1,2-Dichloroethene	18419.8	ug/L	D	1000.0
Trichloroethene	3650.0	ug/L	D	1000.0

GC/MS analysis performed using EPA Method 624

Limit of Quantitation adjusted based upon sample dilution factor.

Data Qualifiers:

B	Analyte also detected in blank	J	Estimated Value
D	Compound quantitated on diluted sample	N.D.	None Detected
E	Concentration exceeded the calibration range of the instrument		

Carpenter Technology Corporation
Chemical Technology Group

CARPENTER

Chemical Analysis Report

Sample ID	***E27536***	**Requestor**	*Sean McGowan*
Copies			

Sample Information

Description	MP-7		
Location	Athens, GA - Former General Time		
Code	M-WA-WELL-XXXXXX		
Requestor ID	MP-7		
Sampled	01/26/2017	**Time**	1210
Submitted	01/27/2017		
Reported	01/31/2017		
Taken by	Sean Lewis		
Method	Grab		
Volume	3x40mL		
Comments			
Cooler Rec'd at 6 deg C.			

This analysis report was reviewed and approved by: Tim Ozmick

Carpenter Technology Corporation
R&D Chemical Laboratory
Volatile Organics Analysis Report

Sample Name:	MP-7		
Data File Name:	E27536.D	**Date Received:**	
Analysis Date:	01/27/17	**Sample Wt/Vol:**	5 ml
Dilution Factor:	100	**Moisture Content:**	100 %
Operator:	MMB	**GC/MS Column:**	DB-VRX

Compound Name	Analysis Result	Units	Data Qualifiers	Limit of Quantitation
Vinyl chloride	114.6	ug/L	JD	500.0
cis-1,2-Dichloroethene	2397.7	ug/L	D	500.0
Trichloroethene	3703.4	ug/L	D	500.0

GC/MS analysis performed using EPA Method 624

Limit of Quantitation adjusted based upon sample dilution factor.

Data Qualifiers:

B	Analyte also detected in blank	J	Estimated Value
D	Compound quantitated on diluted sample	N.D.	None Detected
E	Concentration exceeded the calibration range of the instrument		

Carpenter Technology Corporation
Chemical Technology Group

CARPENTER

Chemical Analysis Report

Sample ID	***E27537***	**Requestor**	*Sean McGowan*
Copies			

Sample Information

Description	Field Blank		
Location	Athens, GA - Former General Time		
Code	M-WA-WELL-XXXXXX		
Requestor ID	Field Blank		
Sampled	01/26/2017	**Time**	1230
Submitted	01/27/2017		
Reported	01/31/2017		
Taken by	Sean Lewis		
Method	Grab		
Volume	3x40mL		
Comments			
Cooler Rec'd at 6 deg C.			

This analysis report was reviewed and approved by: Tim Oswald

Carpenter Technology Corporation
R&D Chemical Laboratory
Volatile Organics Analysis Report

Sample Name:	Field Blank		
Data File Name:	E27537.D	**Date Received:**	
Analysis Date:	01/27/17	**Sample Wt/Vol:**	5 ml
Dilution Factor:	1	**Moisture Content:**	100 %
Operator:	MMB	**GC/MS Column:**	DB-VRX

Compound Name	Analysis Result	Units	Data Qualifiers	Limit of Quantitation
Vinyl chloride	N.D.	ug/L		5.0
cis-1,2-Dichloroethene	N.D.	ug/L		5.0
Trichloroethene	N.D.	ug/L		5.0

GC/MS analysis performed using EPA Method 624

Limit of Quantitation adjusted based upon sample dilution factor.

Data Qualifiers:

B Analyte also detected in blank
D Compound quantitated on diluted sample
E Concentration exceeded the calibration range of the instrument
J Estimated Value
N.D. None Detected

Carpenter Technology Corporation
Chemical Technology Group

CARPENTER

Chemical Analysis Report

Sample ID	***E27538***	**Requestor**	*Sean McGowan*
Copies			

Sample Information

Description	Trip Blank		
Location	Athens, GA - Former General Time		
Code	M-WA-WELL-XXXXXX		
Requestor ID	Trip Blank		
Sampled	01/23/2017	**Time**	
Submitted	01/27/2017		
Reported	01/31/2017		
Taken by	Sean Lewis		
Method	Grab		
Volume	3x40mL		
Comments			
Cooler Rec'd at 6 deg C.			
Trip Blank Prepared by EH (Lancaster Labs) on 1/23/17.			

This analysis report was reviewed and approved by: Tim Oswald

Carpenter Technology Corporation
R&D Chemical Laboratory
Volatile Organics Analysis Report

Sample Name:	Trip Blank		
Data File Name:	E27538.D	**Date Received:**	
Analysis Date:	01/27/17	**Sample Wt/Vol:**	5 ml
Dilution Factor:	1	**Moisture Content:**	100 %
Operator:	MMB	**GC/MS Column:**	DB-VRX

Compound Name	Analysis Result	Units	Data Qualifiers	Limit of Quantitation
Vinyl chloride	N.D.	ug/L		5.0
cis-1,2-Dichloroethene	N.D.	ug/L		5.0
Trichloroethene	N.D.	ug/L		5.0

GC/MS analysis performed using EPA Method 624

Limit of Quantitation adjusted based upon sample dilution factor.

Data Qualifiers:

B Analyte also detected in blank
D Compound quantitated on diluted sample
E Concentration exceeded the calibration range of the instrument
J Estimated Value
N.D. None Detected

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

Report Date: March 23, 2017

Project: Former General Time

Submittal Date: 03/10/2017
Group Number: 1775905
PO Number: 128752-003
State of Sample Origin: GA

Client Sample Description	Lancaster Labs (LL) #
MW-1I Grab Groundwater	8880230
MW-1S Grab Groundwater	8880231
MW-9I Grab Groundwater	8880232
MW-9D Grab Groundwater	8880233
MW-7I Grab Groundwater	8880234
MW-8I Grab Groundwater	8880235
MW-6I Grab Groundwater	8880236
MW-5I Grab Groundwater	8880237
MW-2S Grab Groundwater	8880238
MW-2I Grab Groundwater	8880239
MW-11I Grab Groundwater	8880240
MW-11D Grab Groundwater	8880241
MW-11S Grab Groundwater	8880242
SW-1 Grab Surface Water	8880243
MW-3I Grab Groundwater	8880244
MW-16D Grab Groundwater	8880245
MW-16I Grab Groundwater	8880246
MP-3 Grab Groundwater	8880247
MP-7 Grab Groundwater	8880248
MP-8 Grab Groundwater	8880249
Trip Blank Water	8880250

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ . To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To Haley Aldrich Attn: Mark Miesfeldt

Electronic Copy To	Haley Aldrich	Attn: Shawn Lewis
Electronic Copy To	Carpenter Technology Corp.-PA	Attn: Mike Reichardt
Electronic Copy To	Carpenter Technology Corp.	Attn: Amie Chafin

Respectfully Submitted,

Lyssa M. Longenecker

Lyssa M. Longenecker
Specialist

(717) 556-7321

eurofins | Lancaster Laboratories Environmental

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Analysis Report

Sample Description: MW-1I Grab Groundwater
Carpenter Site - Athens, GA

LL Sample # WW 8880230
LL Group # 1775905
Account # 00435

Project Name: Former General Time

Collected: 03/06/2017 15:00 by JY

Submitted: 03/10/2017 10:30
Reported: 03/23/2017 19:20

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

MW-1I

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	1,1-Dichloroethane	75-34-3	< 1	1	1
10335	1,1-Dichloroethene	75-35-4	< 1	1	1
10335	cis-1,2-Dichloroethene	156-59-2	< 1	1	1
10335	trans-1,2-Dichloroethene	156-60-5	< 1	1	1
10335	Methylene Chloride	75-09-2	< 4	4	1
10335	1,1,2-Trichloroethane	79-00-5	< 1	1	1
10335	Trichloroethene	79-01-6	< 1	1	1
10335	Vinyl Chloride	75-01-4	< 1	1	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170762AA	03/17/2017 17:37	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P170762AA	03/17/2017 17:37	Kevin A Sposito	1

eurofins | Lancaster Laboratories Environmental

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Analysis Report

Sample Description: MW-1S Grab Groundwater
Carpenter Site - Athens, GA

LL Sample # WW 8880231
LL Group # 1775905
Account # 00435

Project Name: Former General Time

Collected: 03/06/2017 15:15 by JY

Submitted: 03/10/2017 10:30
Reported: 03/23/2017 19:20

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

MW-1S

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	1,1-Dichloroethane	75-34-3	< 1	1	1
10335	1,1-Dichloroethene	75-35-4	< 1	1	1
10335	cis-1,2-Dichloroethene	156-59-2	< 1	1	1
10335	trans-1,2-Dichloroethene	156-60-5	< 1	1	1
10335	Methylene Chloride	75-09-2	< 4	4	1
10335	1,1,2-Trichloroethane	79-00-5	< 1	1	1
10335	Trichloroethene	79-01-6	< 1	1	1
10335	Vinyl Chloride	75-01-4	< 1	1	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170762AA	03/17/2017 15:02	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P170762AA	03/17/2017 15:02	Kevin A Sposito	1

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Analysis Report

Sample Description: MW-9I Grab Groundwater
Carpenter Site - Athens, GA

LL Sample # WW 8880232
LL Group # 1775905
Account # 00435

Project Name: Former General Time

Collected: 03/07/2017 09:22 by JY

Submitted: 03/10/2017 10:30
Reported: 03/23/2017 19:20

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

MW-9I

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	1,1-Dichloroethane	75-34-3	< 1	1	1
10335	1,1-Dichloroethene	75-35-4	< 1	1	1
10335	cis-1,2-Dichloroethene	156-59-2	62	1	1
10335	trans-1,2-Dichloroethene	156-60-5	< 1	1	1
10335	Methylene Chloride	75-09-2	< 4	4	1
10335	1,1,2-Trichloroethane	79-00-5	< 1	1	1
10335	Trichloroethene	79-01-6	630	10	10
10335	Vinyl Chloride	75-01-4	< 1	1	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170762AA	03/17/2017 18:28	Kevin A Sposito	1
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170762AA	03/17/2017 18:54	Kevin A Sposito	10
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P170762AA	03/17/2017 18:28	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	2	P170762AA	03/17/2017 18:54	Kevin A Sposito	10

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Analysis Report

Sample Description: MW-9D Grab Groundwater
Carpenter Site - Athens, GA

LL Sample # WW 8880233
LL Group # 1775905
Account # 00435

Project Name: Former General Time

Collected: 03/07/2017 09:48 by JY

Submitted: 03/10/2017 10:30
Reported: 03/23/2017 19:20

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

MW-9D

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		ug/l	ug/l	
10335	1,1-Dichloroethane	75-34-3	< 1	1	1
10335	1,1-Dichloroethene	75-35-4	< 1	1	1
10335	cis-1,2-Dichloroethene	156-59-2	< 1	1	1
10335	trans-1,2-Dichloroethene	156-60-5	< 1	1	1
10335	Methylene Chloride	75-09-2	< 4	4	1
10335	1,1,2-Trichloroethane	79-00-5	< 1	1	1
10335	Trichloroethene	79-01-6	< 1	1	1
10335	Vinyl Chloride	75-01-4	1	1	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170762AA	03/17/2017 15:28	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P170762AA	03/17/2017 15:28	Kevin A Sposito	1

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Analysis Report

Sample Description: MW-7I Grab Groundwater
Carpenter Site - Athens, GA

LL Sample # WW 8880234
LL Group # 1775905
Account # 00435

Project Name: Former General Time

Collected: 03/07/2017 10:52 by JY

Submitted: 03/10/2017 10:30
Reported: 03/23/2017 19:20

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

MW-7I

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	1,1-Dichloroethane	75-34-3	< 1	1	1
10335	1,1-Dichloroethene	75-35-4	< 1	1	1
10335	cis-1,2-Dichloroethene	156-59-2	2	1	1
10335	trans-1,2-Dichloroethene	156-60-5	< 1	1	1
10335	Methylene Chloride	75-09-2	< 4	4	1
10335	1,1,2-Trichloroethane	79-00-5	< 1	1	1
10335	Trichloroethene	79-01-6	< 1	1	1
10335	Vinyl Chloride	75-01-4	3	1	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170763AA	03/18/2017 03:24	Kevin D Kelly	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P170763AA	03/18/2017 03:24	Kevin D Kelly	1

Sample Description: MW-8I Grab Groundwater
Carpenter Site - Athens, GA

LL Sample # WW 8880235
LL Group # 1775905
Account # 00435

Project Name: Former General Time

Collected: 03/07/2017 11:36 by JY

Submitted: 03/10/2017 10:30
Reported: 03/23/2017 19:20

Carpenter Technology Corp.-PA
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MW-8I

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	1,1-Dichloroethane	75-34-3	< 1	1	1
10335	1,1-Dichloroethene	75-35-4	< 1	1	1
10335	cis-1,2-Dichloroethene	156-59-2	< 1	1	1
10335	trans-1,2-Dichloroethene	156-60-5	< 1	1	1
10335	Methylene Chloride	75-09-2	< 4	4	1
10335	1,1,2-Trichloroethane	79-00-5	< 1	1	1
10335	Trichloroethene	79-01-6	< 1	1	1
10335	Vinyl Chloride	75-01-4	< 1	1	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170763AA	03/18/2017 03:50	Kevin D Kelly	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P170763AA	03/18/2017 03:50	Kevin D Kelly	1

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Analysis Report

Sample Description: MW-6I Grab Groundwater
Carpenter Site - Athens, GA

LL Sample # WW 8880236
LL Group # 1775905
Account # 00435

Project Name: Former General Time

Collected: 03/07/2017 13:39 by JY

Submitted: 03/10/2017 10:30
Reported: 03/23/2017 19:20

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MW-6I

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	1,1-Dichloroethane	75-34-3	< 1	1	1
10335	1,1-Dichloroethene	75-35-4	< 1	1	1
10335	cis-1,2-Dichloroethene	156-59-2	41	1	1
10335	trans-1,2-Dichloroethene	156-60-5	< 1	1	1
10335	Methylene Chloride	75-09-2	< 4	4	1
10335	1,1,2-Trichloroethane	79-00-5	< 1	1	1
10335	Trichloroethene	79-01-6	290	10	10
10335	Vinyl Chloride	75-01-4	< 1	1	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170763AA	03/18/2017 05:08	Kevin D Kelly	1
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170763AA	03/18/2017 05:33	Kevin D Kelly	10
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P170763AA	03/18/2017 05:08	Kevin D Kelly	1
01163	GC/MS VOA Water Prep	SW-846 5030B	2	P170763AA	03/18/2017 05:33	Kevin D Kelly	10

Sample Description: MW-5I Grab Groundwater
Carpenter Site - Athens, GA

LL Sample # WW 8880237
LL Group # 1775905
Account # 00435

Project Name: Former General Time

Collected: 03/07/2017 14:28 by JY

Submitted: 03/10/2017 10:30
Reported: 03/23/2017 19:20

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MW-5I

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	1,1-Dichloroethane	75-34-3	< 1	1	1
10335	1,1-Dichloroethene	75-35-4	< 1	1	1
10335	cis-1,2-Dichloroethene	156-59-2	3	1	1
10335	trans-1,2-Dichloroethene	156-60-5	< 1	1	1
10335	Methylene Chloride	75-09-2	< 4	4	1
10335	1,1,2-Trichloroethane	79-00-5	< 1	1	1
10335	Trichloroethene	79-01-6	74	1	1
10335	Vinyl Chloride	75-01-4	< 1	1	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170763AA	03/18/2017 04:16	Kevin D Kelly	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P170763AA	03/18/2017 04:16	Kevin D Kelly	1

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Analysis Report

Sample Description: MW-2S Grab Groundwater
Carpenter Site - Athens, GA

LL Sample # WW 8880238
LL Group # 1775905
Account # 00435

Project Name: Former General Time

Collected: 03/07/2017 15:25 by JY

Submitted: 03/10/2017 10:30
Reported: 03/23/2017 19:20

Carpenter Technology Corp.-PA
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MW-2S

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	1,1-Dichloroethane	75-34-3	< 1	1	1
10335	1,1-Dichloroethene	75-35-4	< 1	1	1
10335	cis-1,2-Dichloroethene	156-59-2	< 1	1	1
10335	trans-1,2-Dichloroethene	156-60-5	< 1	1	1
10335	Methylene Chloride	75-09-2	< 4	4	1
10335	1,1,2-Trichloroethane	79-00-5	< 1	1	1
10335	Trichloroethene	79-01-6	< 1	1	1
10335	Vinyl Chloride	75-01-4	< 1	1	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170763AA	03/18/2017 04:42	Kevin D Kelly	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P170763AA	03/18/2017 04:42	Kevin D Kelly	1

Sample Description: MW-2I Grab Groundwater
Carpenter Site - Athens, GA

LL Sample # WW 8880239
LL Group # 1775905
Account # 00435

Project Name: Former General Time

Collected: 03/07/2017 15:45 by JY

Submitted: 03/10/2017 10:30
Reported: 03/23/2017 19:20

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Reading PA 19612-4662

MW-2I

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		ug/l	ug/l	
10335	1,1-Dichloroethane	75-34-3	< 20	20	20
10335	1,1-Dichloroethene	75-35-4	< 20	20	20
10335	cis-1,2-Dichloroethene	156-59-2	1,400	20	20
10335	trans-1,2-Dichloroethene	156-60-5	23	20	20
10335	Methylene Chloride	75-09-2	< 80	80	20
10335	1,1,2-Trichloroethane	79-00-5	< 20	20	20
10335	Trichloroethene	79-01-6	14,000	200	200
10335	Vinyl Chloride	75-01-4	< 20	20	20

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170763AA	03/18/2017 05:59	Kevin D Kelly	20
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170763AA	03/18/2017 06:25	Kevin D Kelly	200
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P170763AA	03/18/2017 05:59	Kevin D Kelly	20
01163	GC/MS VOA Water Prep	SW-846 5030B	2	P170763AA	03/18/2017 06:25	Kevin D Kelly	200

Sample Description: MW-11I Grab Groundwater
Carpenter Site - Athens, GA

LL Sample # WW 8880240
LL Group # 1775905
Account # 00435

Project Name: Former General Time

Collected: 03/08/2017 10:35 by JY

Submitted: 03/10/2017 10:30
Reported: 03/23/2017 19:20

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

MW11S

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	1,1-Dichloroethane	75-34-3	< 1	1	1
10335	1,1-Dichloroethene	75-35-4	< 1	1	1
10335	cis-1,2-Dichloroethene	156-59-2	41	1	1
10335	trans-1,2-Dichloroethene	156-60-5	< 1	1	1
10335	Methylene Chloride	75-09-2	< 4	4	1
10335	1,1,2-Trichloroethane	79-00-5	< 1	1	1
10335	Trichloroethene	79-01-6	340	10	10
10335	Vinyl Chloride	75-01-4	< 1	1	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170764AA	03/18/2017 06:12	Kevin D Kelly	1
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170764AA	03/18/2017 06:37	Kevin D Kelly	10
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P170764AA	03/18/2017 06:12	Kevin D Kelly	1
01163	GC/MS VOA Water Prep	SW-846 5030B	2	P170764AA	03/18/2017 06:37	Kevin D Kelly	10

Sample Description: MW-11D Grab Groundwater
Carpenter Site - Athens, GA

LL Sample # WW 8880241
LL Group # 1775905
Account # 00435

Project Name: Former General Time

Collected: 03/08/2017 10:45 by JY

Submitted: 03/10/2017 10:30
Reported: 03/23/2017 19:20

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

MW11D

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	1,1-Dichloroethane	75-34-3	< 1	1	1
10335	1,1-Dichloroethene	75-35-4	< 1	1	1
10335	cis-1,2-Dichloroethene	156-59-2	1	1	1
10335	trans-1,2-Dichloroethene	156-60-5	< 1	1	1
10335	Methylene Chloride	75-09-2	< 4	4	1
10335	1,1,2-Trichloroethane	79-00-5	< 1	1	1
10335	Trichloroethene	79-01-6	< 1	1	1
10335	Vinyl Chloride	75-01-4	< 1	1	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170764AA	03/18/2017 05:20	Kevin D Kelly	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P170764AA	03/18/2017 05:20	Kevin D Kelly	1

Sample Description: MW-11S Grab Groundwater
Carpenter Site - Athens, GA

LL Sample # WW 8880242
LL Group # 1775905
Account # 00435

Project Name: Former General Time

Collected: 03/08/2017 11:49 by JY

Submitted: 03/10/2017 10:30
Reported: 03/23/2017 19:20

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

MW11S

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	1,1-Dichloroethane	75-34-3	< 1	1	1
10335	1,1-Dichloroethene	75-35-4	< 1	1	1
10335	cis-1,2-Dichloroethene	156-59-2	72	1	1
10335	trans-1,2-Dichloroethene	156-60-5	< 1	1	1
10335	Methylene Chloride	75-09-2	< 4	4	1
10335	1,1,2-Trichloroethane	79-00-5	< 1	1	1
10335	Trichloroethene	79-01-6	150	1	1
10335	Vinyl Chloride	75-01-4	< 1	1	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170791AA	03/20/2017 14:32	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P170791AA	03/20/2017 14:32	Kevin A Sposito	1

Sample Description: SW-1 Grab Surface Water
Carpenter Site - Athens, GA

LL Sample # WW 8880243
LL Group # 1775905
Account # 00435

Project Name: Former General Time

Collected: 03/08/2017 13:40 by JY

Submitted: 03/10/2017 10:30
Reported: 03/23/2017 19:20

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

SW--1

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		ug/l	ug/l	
10335	1,1-Dichloroethane	75-34-3	< 1	1	1
10335	1,1-Dichloroethene	75-35-4	< 1	1	1
10335	cis-1,2-Dichloroethene	156-59-2	< 1	1	1
10335	trans-1,2-Dichloroethene	156-60-5	< 1	1	1
10335	Methylene Chloride	75-09-2	< 4	4	1
10335	1,1,2-Trichloroethane	79-00-5	< 1	1	1
10335	Trichloroethene	79-01-6	< 1	1	1
10335	Vinyl Chloride	75-01-4	< 1	1	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170793AA	03/21/2017 03:08	Kevin D Kelly	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P170793AA	03/21/2017 03:08	Kevin D Kelly	1

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Analysis Report

Sample Description: MW-3I Grab Groundwater
Carpenter Site - Athens, GA

LL Sample # WW 8880244
LL Group # 1775905
Account # 00435

Project Name: Former General Time

Collected: 03/08/2017 15:02 by JY

Submitted: 03/10/2017 10:30
Reported: 03/23/2017 19:20

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

MW-3I

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	1,1-Dichloroethane	75-34-3	< 1	1	1
10335	1,1-Dichloroethene	75-35-4	< 1	1	1
10335	cis-1,2-Dichloroethene	156-59-2	< 1	1	1
10335	trans-1,2-Dichloroethene	156-60-5	< 1	1	1
10335	Methylene Chloride	75-09-2	< 4	4	1
10335	1,1,2-Trichloroethane	79-00-5	< 1	1	1
10335	Trichloroethene	79-01-6	< 1	1	1
10335	Vinyl Chloride	75-01-4	< 1	1	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170793AA	03/21/2017 03:34	Kevin D Kelly	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P170793AA	03/21/2017 03:34	Kevin D Kelly	1

Sample Description: MW-16D Grab Groundwater
Carpenter Site - Athens, GA

LL Sample # WW 8880245
LL Group # 1775905
Account # 00435

Project Name: Former General Time

Collected: 03/09/2017 09:14 by JY

Submitted: 03/10/2017 10:30
Reported: 03/23/2017 19:20

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

MW16D

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	1,1-Dichloroethane	75-34-3	< 1	1	1
10335	1,1-Dichloroethene	75-35-4	< 1	1	1
10335	cis-1,2-Dichloroethene	156-59-2	50	1	1
10335	trans-1,2-Dichloroethene	156-60-5	< 1	1	1
10335	Methylene Chloride	75-09-2	< 4	4	1
10335	1,1,2-Trichloroethane	79-00-5	< 1	1	1
10335	Trichloroethene	79-01-6	130	1	1
10335	Vinyl Chloride	75-01-4	< 1	1	1
GC Miscellaneous	**RSKSOP-175 modified**		**ug/l**	**ug/l**	
07105	Ethane	74-84-0	< 5.0	5.0	1
07105	Ethene	74-85-1	< 5.0	5.0	1
07105	Methane	74-82-8	< 5.0	5.0	1
Metals	**SW-846 6010B**		**mg/l**	**mg/l**	
01754	Iron	7439-89-6	< 0.200	0.200	1
Wet Chemistry	**EPA 300.0**		**mg/l**	**mg/l**	
00228	Sulfate	14808-79-8	7.2	5.0	5
	SM 5310 C-2000		**mg/l**	**mg/l**	
00273	Total Organic Carbon	n.a.	< 1.0	1.0	1
	SM 3500-Fe B 1997		**mg/l**	**mg/l**	
08344	Ferrous Iron	n.a.	< 0.050	0.050	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170794AA	03/21/2017 00:20	Kevin D Kelly	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P170794AA	03/21/2017 00:20	Kevin D Kelly	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	170740008A	03/17/2017 10:36	Johanna C Kennedy	1
01754	Iron	SW-846 6010B	1	170721848009	03/22/2017 18:58	Elaine F Stoltzfus	1
01848	ICP-WW, 3005A (tot rec) - U3	SW-846 3005A	1	170721848009	03/20/2017 22:00	Annamaria Kuhns	1

Sample Description: MW-16D Grab Groundwater
Carpenter Site - Athens, GA

LL Sample # WW 8880245
LL Group # 1775905
Account # 00435

Project Name: Former General Time

Collected: 03/09/2017 09:14 by JY

Submitted: 03/10/2017 10:30
Reported: 03/23/2017 19:20

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

MW16D

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00228	Sulfate	EPA 300.0	1	17075249601B	03/17/2017 03:08	Zachary W Enck	5
00273	Total Organic Carbon	SM 5310 C-2000	1	17075667601B	03/16/2017 20:17	Drew M Gerhart	1
08344	Ferrous Iron	SM 3500-Fe B 1997	1	17079834402A	03/20/2017 21:30	Daniel S Smith	1

Sample Description: MW-16I Grab Groundwater
Carpenter Site - Athens, GA

LL Sample # WW 8880246
LL Group # 1775905
Account # 00435

Project Name: Former General Time

Collected: 03/09/2017 09:35 by JY

Submitted: 03/10/2017 10:30
Reported: 03/23/2017 19:20

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

MW16I

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	1,1-Dichloroethane	75-34-3	< 20	20	20
10335	1,1-Dichloroethene	75-35-4	< 20	20	20
10335	cis-1,2-Dichloroethene	156-59-2	9,100	200	200
10335	trans-1,2-Dichloroethene	156-60-5	270	20	20
10335	Methylene Chloride	75-09-2	< 80	80	20
10335	1,1,2-Trichloroethane	79-00-5	< 20	20	20
10335	Trichloroethene	79-01-6	< 20	20	20
10335	Vinyl Chloride	75-01-4	950	20	20
GC Miscellaneous	**RSKSOP-175 modified**		**ug/l**	**ug/l**	
07105	Ethane	74-84-0	6.5	5.0	1
07105	Ethene	74-85-1	3,200	100	20
07105	Methane	74-82-8	2,000	100	20
Metals	**SW-846 6010B**		**mg/l**	**mg/l**	
01754	Iron	7439-89-6	35.8	0.200	1
Wet Chemistry	**EPA 300.0**		**mg/l**	**mg/l**	
00228	Sulfate	14808-79-8	< 5.0	5.0	5
	SM 5310 C-2000		**mg/l**	**mg/l**	
00273	Total Organic Carbon	n.a.	384	25.0	25
	SM 3500-Fe B 1997		**mg/l**	**mg/l**	
08344	Ferrous Iron	n.a.	36.4	5.0	100

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170794AA	03/21/2017 05:56	Kevin D Kelly	20
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170794AA	03/21/2017 06:22	Kevin D Kelly	200
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P170794AA	03/21/2017 05:56	Kevin D Kelly	20
01163	GC/MS VOA Water Prep	SW-846 5030B	2	P170794AA	03/21/2017 06:22	Kevin D Kelly	200
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	170740008A	03/16/2017 23:38	Johanna C Kennedy	20

Sample Description: MW-16I Grab Groundwater
Carpenter Site - Athens, GA

LL Sample # WW 8880246
LL Group # 1775905
Account # 00435

Project Name: Former General Time

Collected: 03/09/2017 09:35 by JY

Submitted: 03/10/2017 10:30
Reported: 03/23/2017 19:20

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

MW16I

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	170740008A	03/17/2017 21:17	Johanna C Kennedy	1
01754	Iron	SW-846 6010B	1	170801848001	03/22/2017 20:57	Elaine F Stoltzfus	1
01848	ICP-WW, 3005A (tot rec) - U3	SW-846 3005A	1	170801848001	03/21/2017 19:03	Barbara A Kane	1
00228	Sulfate	EPA 300.0	1	17075249601B	03/17/2017 03:51	Zachary W Enck	5
00273	Total Organic Carbon	SM 5310 C-2000	1	17075667601B	03/17/2017 15:04	Drew M Gerhart	25
08344	Ferrous Iron	SM 3500-Fe B 1997	1	17079834402A	03/20/2017 21:30	Daniel S Smith	100

Sample Description: MP-3 Grab Groundwater
Carpenter Site - Athens, GA

LL Sample # WW 8880247
LL Group # 1775905
Account # 00435

Project Name: Former General Time

Collected: 03/09/2017 10:21 by JY

Submitted: 03/10/2017 10:30
Reported: 03/23/2017 19:20

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

MP--3

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	1,1-Dichloroethane	75-34-3	1	1	1
10335	1,1-Dichloroethene	75-35-4	< 1	1	1
10335	cis-1,2-Dichloroethene	156-59-2	140	1	1
10335	trans-1,2-Dichloroethene	156-60-5	14	1	1
10335	Methylene Chloride	75-09-2	< 4	4	1
10335	1,1,2-Trichloroethane	79-00-5	< 1	1	1
10335	Trichloroethene	79-01-6	< 1	1	1
10335	Vinyl Chloride	75-01-4	15	1	1
	A preserved vial was submitted for analysis. However, the pH at the time of analysis was 5.				
GC Miscellaneous	**RSKSOP-175 modified**		**ug/l**	**ug/l**	
07105	Ethane	74-84-0	< 5.0	5.0	1
07105	Ethene	74-85-1	97	5.0	1
07105	Methane	74-82-8	16,000	500	100
	A preserved vial was submitted for analysis. However, the pH at the time of analysis was 6.				
Metals	**SW-846 6010B**		**mg/l**	**mg/l**	
01754	Iron	7439-89-6	47.0	0.200	1
Wet Chemistry	**EPA 300.0**		**mg/l**	**mg/l**	
00228	Sulfate	14808-79-8	< 5.0	5.0	5
	SM 5310 C-2000		**mg/l**	**mg/l**	
00273	Total Organic Carbon	n.a.	2,290	50.0	50
	SM 3500-Fe B 1997		**mg/l**	**mg/l**	
08344	Ferrous Iron	n.a.	46.9	5.0	100

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.
Preservation requirements were not met. The pH preservation of all non-volatile containers was checked upon receipt at the laboratory. The container for the following analysis was not within specification and was adjusted accordingly by the laboratory: Total Organic Carbon

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170794AA	03/21/2017 00:46	Kevin D Kelly	1

Sample Description: MP-3 Grab Groundwater
Carpenter Site - Athens, GA

LL Sample # WW 8880247
LL Group # 1775905
Account # 00435

Project Name: Former General Time

Collected: 03/09/2017 10:21 by JY

Submitted: 03/10/2017 10:30
Reported: 03/23/2017 19:20

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

MP--3

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P170794AA	03/21/2017 00:46	Kevin D Kelly	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	170740008A	03/17/2017 19:31	Johanna C Kennedy	100
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	170740008A	03/17/2017 21:35	Johanna C Kennedy	1
01754	Iron	SW-846 6010B	1	170721848009	03/22/2017 19:01	Elaine F Stoltzfus	1
01848	ICP-WW, 3005A (tot rec) - U3	SW-846 3005A	1	170721848009	03/20/2017 22:00	Annamaria Kuhns	1
00228	Sulfate	EPA 300.0	1	17075249601B	03/17/2017 04:05	Zachary W Enck	5
00273	Total Organic Carbon	SM 5310 C-2000	1	17075667601B	03/16/2017 20:45	Drew M Gerhart	50
08344	Ferrous Iron	SM 3500-Fe B 1997	1	17079834402A	03/20/2017 21:30	Daniel S Smith	100

Sample Description: MP-7 Grab Groundwater
Carpenter Site - Athens, GA

LL Sample # WW 8880248
LL Group # 1775905
Account # 00435

Project Name: Former General Time

Collected: 03/09/2017 10:42 by JY

Submitted: 03/10/2017 10:30
Reported: 03/23/2017 19:20

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

MP--7

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	1,1-Dichloroethane	75-34-3	< 2	2	2
10335	1,1-Dichloroethene	75-35-4	6	2	2
10335	cis-1,2-Dichloroethene	156-59-2	2,900	50	50
10335	trans-1,2-Dichloroethene	156-60-5	17	2	2
10335	Methylene Chloride	75-09-2	< 8	8	2
10335	1,1,2-Trichloroethane	79-00-5	< 2	2	2
10335	Trichloroethene	79-01-6	6,300	50	50
10335	Vinyl Chloride	75-01-4	130	2	2
GC Miscellaneous	**RSKSOP-175 modified**		**ug/l**	**ug/l**	
07105	Ethane	74-84-0	< 5.0	5.0	1
07105	Ethene	74-85-1	310	5.0	1
07105	Methane	74-82-8	7,500	100	20
	The container used for this analysis was submitted with headspace.				
Metals	**SW-846 6010B**		**mg/l**	**mg/l**	
01754	Iron	7439-89-6	33.8	0.200	1
Wet Chemistry	**EPA 300.0**		**mg/l**	**mg/l**	
00228	Sulfate	14808-79-8	25.2	5.0	5
	SM 5310 C-2000		**mg/l**	**mg/l**	
00273	Total Organic Carbon	n.a.	261	10.0	10
	SM 3500-Fe B 1997		**mg/l**	**mg/l**	
08344	Ferrous Iron	n.a.	29.7	10.0	200

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170802AA	03/21/2017 13:01	Kevin A Sposito	2
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170802AA	03/21/2017 14:18	Kevin A Sposito	50
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P170802AA	03/21/2017 13:01	Kevin A Sposito	2
01163	GC/MS VOA Water Prep	SW-846 5030B	2	P170802AA	03/21/2017 14:18	Kevin A Sposito	50
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	170740008A	03/17/2017 19:49	Johanna C Kennedy	20

Sample Description: MP-7 Grab Groundwater
Carpenter Site - Athens, GA

LL Sample # WW 8880248
LL Group # 1775905
Account # 00435

Project Name: Former General Time

Collected: 03/09/2017 10:42 by JY

Submitted: 03/10/2017 10:30
Reported: 03/23/2017 19:20

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

MP--7

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	170740008A	03/17/2017 21:53	Johanna C Kennedy	1
01754	Iron	SW-846 6010B	1	170721848009	03/22/2017 19:05	Elaine F Stoltzfus	1
01848	ICP-WW, 3005A (tot rec) - U3	SW-846 3005A	1	170721848009	03/20/2017 22:00	Annamaria Kuhns	1
00228	Sulfate	EPA 300.0	1	17075249601B	03/17/2017 04:19	Zachary W Enck	5
00273	Total Organic Carbon	SM 5310 C-2000	1	17075667601B	03/17/2017 15:19	Drew M Gerhart	10
08344	Ferrous Iron	SM 3500-Fe B 1997	1	17079834402A	03/20/2017 21:30	Daniel S Smith	200

Sample Description: MP-8 Grab Groundwater
Carpenter Site - Athens, GA

LL Sample # WW 8880249
LL Group # 1775905
Account # 00435

Project Name: Former General Time

Collected: 03/09/2017 11:29 by JY

Submitted: 03/10/2017 10:30
Reported: 03/23/2017 19:20

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

MP--8

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	1,1-Dichloroethane	75-34-3	< 50	50	50
10335	1,1-Dichloroethene	75-35-4	< 50	50	50
10335	cis-1,2-Dichloroethene	156-59-2	27,000	500	500
10335	trans-1,2-Dichloroethene	156-60-5	98	50	50
10335	Methylene Chloride	75-09-2	< 200	200	50
10335	1,1,2-Trichloroethane	79-00-5	< 50	50	50
10335	Trichloroethene	79-01-6	760	50	50
10335	Vinyl Chloride	75-01-4	< 50	50	50
GC Miscellaneous	**RSKSOP-175 modified**		**ug/l**	**ug/l**	
07105	Ethane	74-84-0	< 5.0	5.0	1
07105	Ethene	74-85-1	< 5.0	5.0	1
07105	Methane	74-82-8	110	5.0	1
Metals	**SW-846 6010B**		**mg/l**	**mg/l**	
01754	Iron	7439-89-6	14.7	0.200	1
Wet Chemistry	**EPA 300.0**		**mg/l**	**mg/l**	
00228	Sulfate	14808-79-8	5.4	5.0	5
	SM 5310 C-2000		**mg/l**	**mg/l**	
00273	Total Organic Carbon	n.a.	156	10.0	10
	SM 3500-Fe B 1997		**mg/l**	**mg/l**	
08344	Ferrous Iron	n.a.	12.4	5.0	100

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170802AA	03/21/2017 13:27	Kevin A Sposito	50
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170802AA	03/21/2017 13:53	Kevin A Sposito	500
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P170802AA	03/21/2017 13:27	Kevin A Sposito	50
01163	GC/MS VOA Water Prep	SW-846 5030B	2	P170802AA	03/21/2017 13:53	Kevin A Sposito	500
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	170740008A	03/17/2017 10:53	Johanna C Kennedy	1

Sample Description: MP-8 Grab Groundwater
Carpenter Site - Athens, GA

LL Sample # WW 8880249
LL Group # 1775905
Account # 00435

Project Name: Former General Time

Collected: 03/09/2017 11:29 by JY

Submitted: 03/10/2017 10:30
Reported: 03/23/2017 19:20

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

MP--8

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01754	Iron	SW-846 6010B	1	170721848009	03/22/2017 19:08	Elaine F Stoltzfus	1
01848	ICP-WW, 3005A (tot rec) - U3	SW-846 3005A	1	170721848009	03/20/2017 22:00	Annamaria Kuhns	1
00228	Sulfate	EPA 300.0	1	17075249601B	03/17/2017 05:02	Zachary W Enck	5
00273	Total Organic Carbon	SM 5310 C-2000	1	17075667601B	03/17/2017 15:33	Drew M Gerhart	10
08344	Ferrous Iron	SM 3500-Fe B 1997	1	17079834402A	03/20/2017 21:30	Daniel S Smith	100

Sample Description: Trip Blank Water
Carpenter Site - Athens, GA

LL Sample # WW 8880250
LL Group # 1775905
Account # 00435

Project Name: Former General Time

Collected: 03/06/2017

Submitted: 03/10/2017 10:30
Reported: 03/23/2017 19:20

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

FGTTB

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	1,1-Dichloroethane	75-34-3	< 1	1	1
10335	1,1-Dichloroethene	75-35-4	< 1	1	1
10335	cis-1,2-Dichloroethene	156-59-2	< 1	1	1
10335	trans-1,2-Dichloroethene	156-60-5	< 1	1	1
10335	Methylene Chloride	75-09-2	< 4	4	1
10335	1,1,2-Trichloroethane	79-00-5	< 1	1	1
10335	Trichloroethene	79-01-6	< 1	1	1
10335	Vinyl Chloride	75-01-4	< 1	1	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170762AA	03/17/2017 10:44	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P170762AA	03/17/2017 10:44	Kevin A Sposito	1

Quality Control Summary

Client Name: Carpenter Technology Corp.-PA Group Number: 1775905
Reported: 03/23/2017 19:20

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	LOQ
	ug/l	ug/l
Batch number: P170762AA	Sample number(s): 8880230-8880233,8880250	
1,1-Dichloroethane	< 1	1
1,1-Dichloroethene	< 1	1
cis-1,2-Dichloroethene	< 1	1
trans-1,2-Dichloroethene	< 1	1
Methylene Chloride	< 4	4
1,1,2-Trichloroethane	< 1	1
Trichloroethene	< 1	1
Vinyl Chloride	< 1	1
Batch number: P170763AA	Sample number(s): 8880234-8880239	
1,1-Dichloroethane	< 1	1
1,1-Dichloroethene	< 1	1
cis-1,2-Dichloroethene	< 1	1
trans-1,2-Dichloroethene	< 1	1
Methylene Chloride	< 4	4
1,1,2-Trichloroethane	< 1	1
Trichloroethene	< 1	1
Vinyl Chloride	< 1	1
Batch number: P170764AA	Sample number(s): 8880240-8880241	
1,1-Dichloroethane	< 1	1
1,1-Dichloroethene	< 1	1
cis-1,2-Dichloroethene	< 1	1
trans-1,2-Dichloroethene	< 1	1
Methylene Chloride	< 4	4
1,1,2-Trichloroethane	< 1	1
Trichloroethene	< 1	1
Vinyl Chloride	< 1	1
Batch number: P170791AA	Sample number(s): 8880242	
1,1-Dichloroethane	< 1	1
1,1-Dichloroethene	< 1	1
cis-1,2-Dichloroethene	< 1	1
trans-1,2-Dichloroethene	< 1	1
Methylene Chloride	< 4	4
1,1,2-Trichloroethane	< 1	1
Trichloroethene	< 1	1
Vinyl Chloride	< 1	1
Batch number: P170793AA	Sample number(s): 8880243-8880244	
1,1-Dichloroethane	< 1	1
1,1-Dichloroethene	< 1	1

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Carpenter Technology Corp.-PA Group Number: 1775905
Reported: 03/23/2017 19:20

Method Blank (continued)

Analysis Name	Result	LOQ
	ug/l	ug/l
cis-1,2-Dichloroethene	< 1	1
trans-1,2-Dichloroethene	< 1	1
Methylene Chloride	< 4	4
1,1,2-Trichloroethane	< 1	1
Trichloroethene	< 1	1
Vinyl Chloride	< 1	1
Batch number: P170794AA	Sample number(s): 8880245-8880247	
1,1-Dichloroethane	< 1	1
1,1-Dichloroethene	< 1	1
cis-1,2-Dichloroethene	< 1	1
trans-1,2-Dichloroethene	< 1	1
Methylene Chloride	< 4	4
1,1,2-Trichloroethane	< 1	1
Trichloroethene	< 1	1
Vinyl Chloride	< 1	1
Batch number: P170802AA	Sample number(s): 8880248-8880249	
1,1-Dichloroethane	< 1	1
1,1-Dichloroethene	< 1	1
cis-1,2-Dichloroethene	< 1	1
trans-1,2-Dichloroethene	< 1	1
Methylene Chloride	< 4	4
1,1,2-Trichloroethane	< 1	1
Trichloroethene	< 1	1
Vinyl Chloride	< 1	1
Batch number: 170740008A	Sample number(s): 8880245-8880249	
Ethane	< 5.0	5.0
Ethene	< 5.0	5.0
Methane	< 5.0	5.0
	mg/l	mg/l
Batch number: 170721848009	Sample number(s): 8880245,8880247-8880249	
Iron	< 0.200	0.200
Batch number: 170801848001	Sample number(s): 8880246	
Iron	< 0.200	0.200
Batch number: 17075249601B	Sample number(s): 8880245-8880249	
Sulfate	< 1.0	1.0
Batch number: 17075667601B	Sample number(s): 8880245-8880249	
Total Organic Carbon	< 1.0	1.0
Batch number: 17079834402A	Sample number(s): 8880245-8880249	
Ferrous Iron	< 0.050	0.050

*- Outside of specification
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Quality Control Summary

Client Name: Carpenter Technology Corp.-PA Group Number: 1775905
Reported: 03/23/2017 19:20

LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: P170762AA	Sample number(s): 8880230-8880233,8880250								
1,1-Dichloroethane	20	19.82			99		80-120		
1,1-Dichloroethene	20	20.13			101		76-124		
cis-1,2-Dichloroethene	20	21.1			106		80-120		
trans-1,2-Dichloroethene	20	20.13			101		80-120		
Methylene Chloride	20	20.12			101		80-120		
1,1,2-Trichloroethane	20	20.22			101		80-120		
Trichloroethene	20	19.39			97		80-120		
Vinyl Chloride	20	18.82			94		63-121		
Batch number: P170763AA	Sample number(s): 8880234-8880239								
1,1-Dichloroethane	20	19.97			100		80-120		
1,1-Dichloroethene	20	20.77			104		76-124		
cis-1,2-Dichloroethene	20	20.91			105		80-120		
trans-1,2-Dichloroethene	20	20.62			103		80-120		
Methylene Chloride	20	19.83			99		80-120		
1,1,2-Trichloroethane	20	20.07			100		80-120		
Trichloroethene	20	19.44			97		80-120		
Vinyl Chloride	20	19.3			96		63-121		
Batch number: P170764AA	Sample number(s): 8880240-8880241								
1,1-Dichloroethane	20	20.69			103		80-120		
1,1-Dichloroethene	20	20.9			104		76-124		
cis-1,2-Dichloroethene	20	21.66			108		80-120		
trans-1,2-Dichloroethene	20	21.1			105		80-120		
Methylene Chloride	20	20.89			104		80-120		
1,1,2-Trichloroethane	20	21.27			106		80-120		
Trichloroethene	20	20.54			103		80-120		
Vinyl Chloride	20	19.65			98		63-121		
Batch number: P170791AA	Sample number(s): 8880242								
1,1-Dichloroethane	20	19.71	20	19.7	99	98	80-120	0	30
1,1-Dichloroethene	20	20.42	20	20.2	102	101	76-124	1	30
cis-1,2-Dichloroethene	20	19.98	20	20.14	100	101	80-120	1	30
trans-1,2-Dichloroethene	20	19.9	20	19.95	99	100	80-120	0	30
Methylene Chloride	20	19.15	20	19.1	96	96	80-120	0	30
1,1,2-Trichloroethane	20	19.02	20	18.98	95	95	80-120	0	30
Trichloroethene	20	18.79	20	18.89	94	94	80-120	1	30
Vinyl Chloride	20	18.8	20	18.92	94	95	63-121	1	30
Batch number: P170793AA	Sample number(s): 8880243-8880244								
1,1-Dichloroethane	20	20.44			102		80-120		
1,1-Dichloroethene	20	21			105		76-124		
cis-1,2-Dichloroethene	20	21.34			107		80-120		
trans-1,2-Dichloroethene	20	20.99			105		80-120		
Methylene Chloride	20	20.5			102		80-120		
1,1,2-Trichloroethane	20	20.59			103		80-120		
Trichloroethene	20	19.7			98		80-120		
Vinyl Chloride	20	18.18			91		63-121		

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Quality Control Summary

Client Name: Carpenter Technology Corp.-PA Group Number: 1775905
Reported: 03/23/2017 19:20

LCS/LCSD (continued)

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l					
Batch number: P170794AA	Sample number(s): 8880245-8880247								
1,1-Dichloroethane	20	20.54			103		80-120		
1,1-Dichloroethene	20	20.7			104		76-124		
cis-1,2-Dichloroethene	20	21.5			107		80-120		
trans-1,2-Dichloroethene	20	21.02			105		80-120		
Methylene Chloride	20	20.82			104		80-120		
1,1,2-Trichloroethane	20	20.76			104		80-120		
Trichloroethene	20	20.18			101		80-120		
Vinyl Chloride	20	18.34			92		63-121		
Batch number: P170802AA	Sample number(s): 8880248-8880249								
1,1-Dichloroethane	20	19.7			98		80-120		
1,1-Dichloroethene	20	19.91			100		76-124		
cis-1,2-Dichloroethene	20	20.36			102		80-120		
trans-1,2-Dichloroethene	20	19.47			97		80-120		
Methylene Chloride	20	19.36			97		80-120		
1,1,2-Trichloroethane	20	19.89			99		80-120		
Trichloroethene	20	19.14			96		80-120		
Vinyl Chloride	20	18.41			92		63-121		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 170740008A	Sample number(s): 8880245-8880249								
Ethane	58.4	57.09	58.4	58.26	98	100	85-115	2	20
Ethene	60.8	58.21	60.8	59.47	96	98	83-115	2	20
Methane	59.8	59.17	59.8	61.19	99	102	85-115	3	20
	mg/l	mg/l	mg/l	mg/l					
Batch number: 170721848009	Sample number(s): 8880245,8880247-8880249								
Iron	1.00	1.12			112		80-120		
Batch number: 170801848001	Sample number(s): 8880246								
Iron	1.00	1.02			102		80-120		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 17075249601B	Sample number(s): 8880245-8880249								
Sulfate	7.50	7.72			103		90-110		
Batch number: 17075667601B	Sample number(s): 8880245-8880249								
Total Organic Carbon	25	25.84			103		91-113		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 17079834402A	Sample number(s): 8880245-8880249								
Ferrous Iron	0.400	0.386			96		93-105		

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Quality Control Summary

Client Name: Carpenter Technology Corp.-PA Group Number: 1775905
Reported: 03/23/2017 19:20

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: P170762AA	Sample number(s): 8880230-8880233,8880250 UNSPK: P876183									
1,1-Dichloroethane	< 1	20	21.5	20	21.75	108	109	80-120	1	30
1,1-Dichloroethene	< 1	20	22.88	20	22.45	114	112	76-124	2	30
cis-1,2-Dichloroethene	< 1	20	21.9	20	22.56	109	113	80-120	3	30
trans-1,2-Dichloroethene	< 1	20	22.41	20	22.14	112	111	80-120	1	30
Methylene Chloride	< 4	20	21.07	20	21.76	105	109	80-120	3	30
1,1,2-Trichloroethane	< 1	20	20.19	20	21.03	101	105	80-120	4	30
Trichloroethene	< 1	20	21.53	20	21.51	108	108	80-120	0	30
Vinyl Chloride	< 1	20	21.81	20	21.15	109	106	63-121	3	30
Batch number: P170763AA	Sample number(s): 8880234-8880239 UNSPK: P876793									
1,1-Dichloroethane	< 1	20	19.5	20	20.05	97	100	80-120	3	30
1,1-Dichloroethene	< 1	20	20.84	20	21.54	104	108	76-124	3	30
cis-1,2-Dichloroethene	< 1	20	20.37	20	20.96	102	105	80-120	3	30
trans-1,2-Dichloroethene	< 1	20	20.23	20	20.74	101	104	80-120	2	30
Methylene Chloride	< 4	20	18.91	20	19.57	95	98	80-120	3	30
1,1,2-Trichloroethane	< 1	20	18.77	20	19.7	94	99	80-120	5	30
Trichloroethene	< 1	20	19.15	20	19.61	96	98	80-120	2	30
Vinyl Chloride	< 1	20	17.96	20	22.65	90	113	63-121	23	30
Batch number: P170764AA	Sample number(s): 8880240-8880241 UNSPK: P878677									
1,1-Dichloroethane	< 1	20	20.8	20	21.68	104	108	80-120	4	30
1,1-Dichloroethene	< 1	20	21.82	20	22.97	109	115	76-124	5	30
cis-1,2-Dichloroethene	< 1	20	21.58	20	22.53	108	113	80-120	4	30
trans-1,2-Dichloroethene	< 1	20	21.32	20	22.65	107	113	80-120	6	30
Methylene Chloride	< 4	20	20.1	20	20.95	100	105	80-120	4	30
1,1,2-Trichloroethane	< 1	20	19.85	20	20.32	99	102	80-120	2	30
Trichloroethene	< 1	20	20.22	20	21.58	101	108	80-120	6	30
Vinyl Chloride	< 1	20	19.09	20	21.69	95	108	63-121	13	30
Batch number: P170793AA	Sample number(s): 8880243-8880244 UNSPK: P879842									
1,1-Dichloroethane	< 1	20	21.39	20	22.61	107	113	80-120	6	30
1,1-Dichloroethene	< 1	20	23.3	20	24.44	116	122	76-124	5	30
cis-1,2-Dichloroethene	< 1	20	21.84	20	23.61	109	118	80-120	8	30
trans-1,2-Dichloroethene	< 1	20	22.31	20	23.22	112	116	80-120	4	30
Methylene Chloride	< 4	20	20.89	20	21.88	104	109	80-120	5	30
1,1,2-Trichloroethane	< 1	20	20.13	20	21.33	101	107	80-120	6	30
Trichloroethene	< 1	20	20.76	20	22.09	104	110	80-120	6	30
Vinyl Chloride	< 1	20	19.11	20	22.19	96	111	63-121	15	30
Batch number: P170794AA	Sample number(s): 8880245-8880247 UNSPK: P880617									
1,1-Dichloroethane	< 1	20	22.2	20	22.61	111	113	80-120	2	30
1,1-Dichloroethene	< 1	20	23.17	20	23.67	116	118	76-124	2	30
cis-1,2-Dichloroethene	< 1	20	22.77	20	23.14	114	116	80-120	2	30
trans-1,2-Dichloroethene	< 1	20	23.15	20	23.46	116	117	80-120	1	30
Methylene Chloride	< 4	20	21.4	20	21.72	107	109	80-120	1	30
1,1,2-Trichloroethane	< 1	20	20.38	20	20.92	102	105	80-120	3	30

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Quality Control Summary

Client Name: Carpenter Technology Corp.-PA Group Number: 1775905
Reported: 03/23/2017 19:20

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Trichloroethene	< 1	20	21.82	20	22.18	109	111	80-120	2	30
Vinyl Chloride	< 1	20	21.9	20	21.23	110	106	63-121	3	30
Batch number: P170802AA	Sample number(s): 8880248-8880249 UNSPK: P887628									
1,1-Dichloroethane	< 1	20	22.11	20	22.05	111	110	80-120	0	30
1,1-Dichloroethene	< 1	20	23.56	20	22.93	118	115	76-124	3	30
cis-1,2-Dichloroethene	< 1	20	22.84	20	22.6	114	113	80-120	1	30
trans-1,2-Dichloroethene	< 1	20	22.9	20	22.96	115	115	80-120	0	30
Methylene Chloride	< 4	20	21.84	20	21.46	109	107	80-120	2	30
1,1,2-Trichloroethane	< 1	20	21.42	20	21.61	107	108	80-120	1	30
Trichloroethene	< 1	20	21.66	20	21.49	108	107	80-120	1	30
Vinyl Chloride	< 1	20	21.6	20	21.45	108	107	63-121	1	30
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 170721848009	Sample number(s): 8880245,8880247-8880249 UNSPK: P880973									
Iron	0.0925	1.00	1.23	1.00	1.20	113	111	75-125	2	20
Batch number: 170801848001	Sample number(s): 8880246 UNSPK: P883270									
Iron	0.778	1.00	1.82	1.00	1.79	104	101	75-125	2	20
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 17075249601B	Sample number(s): 8880245-8880249 UNSPK: 8880245									
Sulfate	7.20	25	30			91		90-110		
Batch number: 17075667601B	Sample number(s): 8880245-8880249 UNSPK: P878365									
Total Organic Carbon	43.49	10	52.61			91 (2)		64-148		
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 17079834402A	Sample number(s): 8880245-8880249 UNSPK: P887425									
Ferrous Iron	24.14	40	61.98	40	62.68	95	96	93-105	1	6

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc mg/l	DUP Conc mg/l	DUP RPD	DUP RPD Max
Batch number: 170721848009	Sample number(s): 8880245,8880247-8880249 BKG: P880973			
Iron	0.0925	0.0852	8 (1)	20
Batch number: 170801848001	Sample number(s): 8880246 BKG: P883270			
Iron	0.778	0.778	0 (1)	20

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Quality Control Summary

Client Name: Carpenter Technology Corp.-PA Group Number: 1775905
Reported: 03/23/2017 19:20

Laboratory Duplicate (continued)

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc	DUP Conc	DUP RPD	DUP RPD Max
	mg/l	mg/l		
Batch number: 17075249601B	Sample number(s): 8880245-8880249		BKG: 8880245	
Sulfate	7.20	6.51	10 (1)	15
Batch number: 17075667601B	Sample number(s): 8880245-8880249		BKG: P878365	
Total Organic Carbon	43.49	43.67	0	9
	mg/l	mg/l		
Batch number: 17079834402A	Sample number(s): 8880245-8880249		BKG: P887425	
Ferrous Iron	24.14	23.74	2 (1)	5

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: VOCs- 5ml Water by 8260B
Batch number: P170762AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8880230	100	103	106	104
8880231	100	104	104	103
8880232	100	103	106	104
8880233	100	103	104	102
8880250	98	100	106	103
Blank	100	103	106	104
LCS	101	107	98	98
MS	99	104	98	97
MSD	101	107	97	97
Limits:	80-116	77-113	80-113	78-113

Analysis Name: VOCs- 5ml Water by 8260B
Batch number: P170763AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8880234	99	99	107	104
8880235	100	100	107	104
8880236	99	100	108	104
8880237	99	99	108	104
8880238	99	100	108	105
8880239	100	101	108	106
Blank	99	99	108	105
LCS	100	103	100	99
MS	100	103	100	100
MSD	100	103	100	101

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P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Carpenter Technology Corp.-PA Group Number: 1775905
Reported: 03/23/2017 19:20

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: VOCs- 5ml Water by 8260B
Batch number: P170763AA

Limits:	80-116	77-113	80-113	78-113

Analysis Name: VOCs- 5ml Water by 8260B
Batch number: P170764AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8880240	100	102	106	103
8880241	96	100	108	104
Blank	99	102	105	104
LCS	100	105	98	97
MS	100	105	98	97
MSD	98	101	99	96
Limits:	80-116	77-113	80-113	78-113

Analysis Name: VOCs- 5ml Water by 8260B
Batch number: P170791AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8880242	101	102	107	105
Blank	101	99	107	105
LCS	101	101	100	100
LCSD	101	102	100	100
Limits:	80-116	77-113	80-113	78-113

Analysis Name: VOCs- 5ml Water by 8260B
Batch number: P170793AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8880243	100	100	106	105
8880244	99	100	107	105
Blank	101	100	107	105
LCS	101	101	100	99
MS	101	104	101	99
MSD	101	103	99	98
Limits:	80-116	77-113	80-113	78-113

Analysis Name: VOCs- 5ml Water by 8260B
Batch number: P170794AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8880245	98	100	106	103
8880246	99	101	105	103
8880247	99	100	106	104
Blank	98	101	106	104
LCS	100	106	98	98
MS	99	103	99	99

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Carpenter Technology Corp.-PA Group Number: 1775905
Reported: 03/23/2017 19:20

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed
unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: VOCs- 5ml Water by 8260B
Batch number: P170794AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
MSD	99	103	98	96
Limits:	80-116	77-113	80-113	78-113

Analysis Name: VOCs- 5ml Water by 8260B
Batch number: P170802AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8880248	98	101	106	103
8880249	100	103	104	103
Blank	99	99	106	104
LCS	101	104	98	97
MS	101	104	97	99
MSD	99	103	97	100
Limits:	80-116	77-113	80-113	78-113

Analysis Name: Volatile Headspace Hydrocarbon
Batch number: 170740008A

	Propene
8880245	81
8880246	78
8880247	76
8880248	78
8880249	79
Blank	105
LCS	98
LCSD	100
Limits:	44-123

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Environmental Analysis Request/Chain of Custody

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For Eurofins Lancaster Laboratories Environmental use only

Acct. # 435 Group # 177505 Sample # 8880030-50

COC # 522611

Client Information

Client: Haley and Aldrich	Acct. #:
Project Name/#: Former General Time	PWSID #:
Project Manager: mack Miesfeldt	P.O. #: 128752-003
Sampler: Jason Yonts, Sean Lewis	Quote #:
State where samples were collected: GA	For Compliance: Yes ☐ No ☐

Matrix

Soil ☐ Sediment ☐ Tissue ☐ | Water ☒ Potable ☐ Ground ☐ NPDES ☐ Surface ☐ | Other: ____

Analysis Requested

Preservation Codes: H

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	VOCs*
MW-1I	3/6/17	1500	X		3	X
MW-1S	3/6/17	1515	X		3	X
MW-9I	3/7/17	922	X		3	X
MW-9D	3/7/17	948	X		3	X
MW-7I	3/7/17	1052	X		3	X
MW-8I	3/7/17	1136	X		3	X
MW-6I	3/7/17	1339	X		3	X
MW-5I	3/7/17	1428	X		3	X
MW-2S	3/7/17	1525	X		3	X
MW-2I	3/7/17	1545	X		3	X

For Lab Use Only

FSC:

SCR#: 202630

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks

1 of 2

*Site COCs

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: _____

E-mail address: mmiesfeldt@haleyaldrich.com

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
[signature]	3-2-17	1340			
[signature]	3/9/17	1730			
			[signature]	3/10/17	1030

EDD Required? Yes No

If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:

UPS _____ FedEx ✓ Other _____

Temperature upon receipt 0.5 °C

Environmental Analysis Request/Chain of Custody

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For Eurofins Lancaster Laboratories Environmental use only

Acct. # 435 Group # 1775905 Sample # 8880230-50

COC # 522612

Client Information

Client: Haley and Aldrich	Acct. #:
Project Name/#: Former General Time	PWSID #:
Project Manager: Mark Miesfeldt	P.O. #: 128752-003
Sampler: Jason Yonts, Sean Lewis	Quote #:
State where samples were collected: GA	For Compliance: Yes ☐ No ☐

For Lab Use Only
FSC:
SCR#:

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks
2 of 2

Sample Identification	Collected Date	Collected Time	Grab	Composite	Matrix	Total # of Containers	VOCs #	Sulfate	Iron	Ferrous Iron	TOC	methane/ethane/ethene					Remarks
					Soil / Sediment / Tissue / Water / Potable / Ground / NPDES / Surface / Other:		Preservation Codes: H	O	N	H	O	H					
MW-11I	3/8/17	1035	X		GW	3	X										* Site COCs
MW-11D	3/8/17	1045	X		GW	3	X										
MW-11S	3/8/17	1149	X		GW	3	X										Run Trip Blanks
SW-1	3/8/17	1340	X		SW	3	X										VOCs
MW-3I	3/8/17	1502	X		GW	3	X										
MW-16D	3/9/17	914	X		GW	11	X	X	X	X	X	X					
MW-16I	3/9/17	935	X		GW	11	X	X	X	X	X	X					
MP-3	3/9/17	1021	X		GW	11	X	X	X	X	X	X					
MP-7	3/9/17	1042	X		GW	11	X	X	X	X	X	X					
MP-8	3/9/17	1129	X		GW	11	X	X	X	X	X	X					

Turnaround Time (TAT) Requested (please circle)
(Standard) Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: _____

E-mail address: mmiesfeldt@haleyaldrich.com

Data Package Options (circle if required)
Type I (EPA Level 3 Equivalent/non-CLP)
Type VI (Raw Data Only)
Type III (Reduced non-CLP)
NJ DKQP
TX TRRP-13
NYSDEC Category A or B
MA MCP
CT RCP

Relinquished by	Date	Time	Received by	Date	Time
[signature]	3/9/17	1730			
			[signature]	3/10/17	1030

EDD Required? Yes No
If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS _____ FedEx _____ Other _____

Temperature upon receipt 0.5 °C

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Sample Administration Receipt Documentation Log

Doc Log ID: 177785

Group Number(s): 1775905

Client: Haley and Aldrich

Delivery and Receipt Information

Delivery Method:	Fed Ex	Arrival Timestamp:	03/10/2017 10:30
Number of Packages:	1	Number of Projects:	1
State/Province of Origin:	GA		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	No	Sample Date/Times match COC:	Yes
Samples Chilled:	Yes	VOA Vial Headspace ≥ 6mm:	No
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	2
Samples Intact:	No	Trip Blank Type:	HCl
Missing Samples:	No	Air Quality Samples Present:	No
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Tanya Brasch (24906) at 17:19 on 03/10/2017

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT131	0.5	DT	Wet	Y	Bagged	N

Samples Not Intact Details

Sample ID on Label	Bottle Code	Bottle Quantity	Container Salvageable?	Comments
MW-2S	40 ml glass vial (GC/MS) - HCl	1	N	

2425 New Holland Pike
Lancaster, PA 17605-2425
T 717-656-2300
F 717-656-2681
www.LancasterLabs.com

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	milliliter(s)
cfu	colony forming units	**MPN**	Most Probable Number
CP Units	cobalt-chloroplatinate units	**N.D.**	none detected
F	degrees Fahrenheit	**ng**	nanogram(s)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…
W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

Report Date: March 22, 2017

Project: Former General Time

Submittal Date: 03/11/2017
Group Number: 1776057
PO Number: 128752-003
State of Sample Origin: GA

Client Sample Description	Lancaster Labs (LL) #
MW-2D Grab Groundwater	8881023
RW-3 Grab Groundwater	8881024
RW-4 Grab Groundwater	8881025
SW-2 Grab Surface Water	8881026
Field Blank Grab Water	8881027
Trip Blank Water	8881028

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ . To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	Haley Aldrich	Attn: Mark Miesfeldt
Electronic Copy To	Haley Aldrich	Attn: Shawn Lewis
Electronic Copy To	Carpenter Technology Corp.-PA	Attn: Mike Reichardt
Electronic Copy To	Carpenter Technology Corp.	Attn: Amie Chafin

Respectfully Submitted,

Lyssa M. Longenecker

Lyssa M. Longenecker
Specialist

(717) 556-7321

eurofins | Lancaster Laboratories Environmental

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Analysis Report

Sample Description: MW-2D Grab Groundwater
Carpenter Site - Athens, GA

LL Sample # WW 8881023
LL Group # 1776057
Account # 00435

Project Name: Former General Time

Collected: 03/09/2017 14:18 by JK

Submitted: 03/11/2017 09:50
Reported: 03/22/2017 14:39

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

CSA2D

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		ug/l	ug/l	
10335	1,1-Dichloroethane	75-34-3	< 1	1	1
10335	1,1-Dichloroethene	75-35-4	< 1	1	1
10335	cis-1,2-Dichloroethene	156-59-2	< 1	1	1
10335	trans-1,2-Dichloroethene	156-60-5	< 1	1	1
10335	Methylene Chloride	75-09-2	< 4	4	1
10335	1,1,2-Trichloroethane	79-00-5	< 1	1	1
10335	Trichloroethene	79-01-6	2	1	1
10335	Vinyl Chloride	75-01-4	< 1	1	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170802AA	03/21/2017 14:45	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P170802AA	03/21/2017 14:45	Kevin A Sposito	1

Sample Description: RW-3 Grab Groundwater
Carpenter Site - Athens, GA

LL Sample # WW 8881024
LL Group # 1776057
Account # 00435

Project Name: Former General Time

Collected: 03/09/2017 15:38 by JK

Submitted: 03/11/2017 09:50
Reported: 03/22/2017 14:39

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

CSAR3

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	1,1-Dichloroethane	75-34-3	< 10	10	10
10335	1,1-Dichloroethene	75-35-4	21	10	10
10335	cis-1,2-Dichloroethene	156-59-2	740	10	10
10335	trans-1,2-Dichloroethene	156-60-5	40	10	10
10335	Methylene Chloride	75-09-2	< 40	40	10
10335	1,1,2-Trichloroethane	79-00-5	< 10	10	10
10335	Trichloroethene	79-01-6	9,000	100	100
10335	Vinyl Chloride	75-01-4	< 10	10	10

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170802AA	03/21/2017 18:12	Kevin A Sposito	10
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170802AA	03/21/2017 18:37	Kevin A Sposito	100
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P170802AA	03/21/2017 18:12	Kevin A Sposito	10
01163	GC/MS VOA Water Prep	SW-846 5030B	2	P170802AA	03/21/2017 18:37	Kevin A Sposito	100

Sample Description: RW-4 Grab Groundwater
Carpenter Site - Athens, GA

LL Sample # WW 8881025
LL Group # 1776057
Account # 00435

Project Name: Former General Time

Collected: 03/09/2017 16:47 by JK

Submitted: 03/11/2017 09:50
Reported: 03/22/2017 14:39

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

CSAR4

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	1,1-Dichloroethane	75-34-3	< 1	1	1
10335	1,1-Dichloroethene	75-35-4	< 1	1	1
10335	cis-1,2-Dichloroethene	156-59-2	< 1	1	1
10335	trans-1,2-Dichloroethene	156-60-5	< 1	1	1
10335	Methylene Chloride	75-09-2	< 4	4	1
10335	1,1,2-Trichloroethane	79-00-5	< 1	1	1
10335	Trichloroethene	79-01-6	6	1	1
10335	Vinyl Chloride	75-01-4	< 1	1	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170802AA	03/21/2017 15:10	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P170802AA	03/21/2017 15:10	Kevin A Sposito	1

Sample Description: SW-2 Grab Surface Water
Carpenter Site - Athens, GA

LL Sample # WW 8881026
LL Group # 1776057
Account # 00435

Project Name: Former General Time

Collected: 03/10/2017 07:55 by JK

Submitted: 03/11/2017 09:50
Reported: 03/22/2017 14:39

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

CSAS2

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	1,1-Dichloroethane	75-34-3	< 1	1	1
10335	1,1-Dichloroethene	75-35-4	< 1	1	1
10335	cis-1,2-Dichloroethene	156-59-2	< 1	1	1
10335	trans-1,2-Dichloroethene	156-60-5	< 1	1	1
10335	Methylene Chloride	75-09-2	< 4	4	1
10335	1,1,2-Trichloroethane	79-00-5	< 1	1	1
10335	Trichloroethene	79-01-6	< 1	1	1
10335	Vinyl Chloride	75-01-4	< 1	1	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170802AA	03/21/2017 15:36	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P170802AA	03/21/2017 15:36	Kevin A Sposito	1

Sample Description: Field Blank Grab Water
Carpenter Site - Athens, GA

LL Sample # WW 8881027
LL Group # 1776057
Account # 00435

Project Name: Former General Time

Collected: 03/10/2017 08:00 by JK

Submitted: 03/11/2017 09:50
Reported: 03/22/2017 14:39

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

CSAFB

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	1,1-Dichloroethane	75-34-3	< 1	1	1
10335	1,1-Dichloroethene	75-35-4	< 1	1	1
10335	cis-1,2-Dichloroethene	156-59-2	< 1	1	1
10335	trans-1,2-Dichloroethene	156-60-5	< 1	1	1
10335	Methylene Chloride	75-09-2	< 4	4	1
10335	1,1,2-Trichloroethane	79-00-5	< 1	1	1
10335	Trichloroethene	79-01-6	< 1	1	1
10335	Vinyl Chloride	75-01-4	< 1	1	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170802AA	03/21/2017 10:51	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P170802AA	03/21/2017 10:51	Kevin A Sposito	1

Sample Description: Trip Blank Water
Carpenter Site - Athens, GA

LL Sample # WW 8881028
LL Group # 1776057
Account # 00435

Project Name: Former General Time

Collected: 03/10/2017 08:00 by JK

Submitted: 03/11/2017 09:50
Reported: 03/22/2017 14:39

Carpenter Technology Corp.-PA
PO Box 14662
Reading PA 19612-4662

TBCSA

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	1,1-Dichloroethane	75-34-3	< 1	1	1
10335	1,1-Dichloroethene	75-35-4	< 1	1	1
10335	cis-1,2-Dichloroethene	156-59-2	< 1	1	1
10335	trans-1,2-Dichloroethene	156-60-5	< 1	1	1
10335	Methylene Chloride	75-09-2	< 4	4	1
10335	1,1,2-Trichloroethane	79-00-5	< 1	1	1
10335	Trichloroethene	79-01-6	< 1	1	1
10335	Vinyl Chloride	75-01-4	< 1	1	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs- 5ml Water by 8260B	SW-846 8260B	1	P170802AA	03/21/2017 11:17	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P170802AA	03/21/2017 11:17	Kevin A Sposito	1

Quality Control Summary

Client Name: Carpenter Technology Corp.-PA Group Number: 1776057
Reported: 03/22/2017 14:39

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result ug/l	LOQ ug/l
Batch number: P170802AA	Sample number(s): 8881023-8881028	
1,1-Dichloroethane	< 1	1
1,1-Dichloroethene	< 1	1
cis-1,2-Dichloroethene	< 1	1
trans-1,2-Dichloroethene	< 1	1
Methylene Chloride	< 4	4
1,1,2-Trichloroethane	< 1	1
Trichloroethene	< 1	1
Vinyl Chloride	< 1	1

LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: P170802AA	Sample number(s): 8881023-8881028								
1,1-Dichloroethane	20	19.7			98		80-120		
1,1-Dichloroethene	20	19.91			100		76-124		
cis-1,2-Dichloroethene	20	20.36			102		80-120		
trans-1,2-Dichloroethene	20	19.47			97		80-120		
Methylene Chloride	20	19.36			97		80-120		
1,1,2-Trichloroethane	20	19.89			99		80-120		
Trichloroethene	20	19.14			96		80-120		
Vinyl Chloride	20	18.41			92		63-121		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: P170802AA	Sample number(s): 8881023-8881028 UNSPK: P887628									
1,1-Dichloroethane	< 1	20	22.11	20	22.05	111	110	80-120	0	30

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Carpenter Technology Corp.-PA Group Number: 1776057
Reported: 03/22/2017 14:39

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
1,1-Dichloroethene	< 1	20	23.56	20	22.93	118	115	76-124	3	30
cis-1,2-Dichloroethene	< 1	20	22.84	20	22.6	114	113	80-120	1	30
trans-1,2-Dichloroethene	< 1	20	22.9	20	22.96	115	115	80-120	0	30
Methylene Chloride	< 4	20	21.84	20	21.46	109	107	80-120	2	30
1,1,2-Trichloroethane	< 1	20	21.42	20	21.61	107	108	80-120	1	30
Trichloroethene	< 1	20	21.66	20	21.49	108	107	80-120	1	30
Vinyl Chloride	< 1	20	21.6	20	21.45	108	107	63-121	1	30

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed
unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: VOCs- 5ml Water by 8260B
Batch number: P170802AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8881023	99	99	106	103
8881024	99	102	105	103
8881025	101	104	104	103
8881026	100	103	104	103
8881027	100	102	104	103
8881028	99	103	105	104
Blank	99	99	106	104
LCS	101	104	98	97
MS	101	104	97	99
MSD	99	103	97	100
Limits:	80-116	77-113	80-113	78-113

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Environmental Analysis Request/Chain of Custody

eurofins | Lancaster Laboratories Environmental

Acct. # 435 | For Eurofins Lancaster Laboratories Environmental use only: Group # 177605 7 | Sample # 388102 3-2P

COC # 522613

Client Information

Client: Haley and Aldrich	Acct. #:
Project Name/#: Former General Time	PWSID #:
Project Manager: Mark Miesfeldt	P.O. #: 128752-003
Sampler: Jason Vonts, Sean Lewis	Quote #:
State where samples were collected: GA	For Compliance: Yes ☐ No ☐

Matrix: Soil ☐ Sediment ☐ Tissue ☐ | Water: Potable ☐ Ground ☒ NPDES ☐ Surface ☒ | Other: ____

Analysis Requested — Preservation Codes: H

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	* VOCs	Remarks
MW-2D	3/9/17	1418	X		3	X	Site COCs
RW-3	3/9/17	1538	X		3	X	
RW-4	3/9/17	1647	X		3	X	
SW-2	3/10/17	755	X		3	X	
Field Blank	3/10/17	800	X		3	X	
Trip Blank	3/10/17	800	X		3	X	

For Lab Use Only
FSC: ____
SCR#: ____

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Turnaround Time (TAT) Requested (please circle)
Standard Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: ____

E-mail address: mmiesfeldt@haleyaldrich.com

Data Package Options (circle if required)
Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)
Type III (Reduced non-CLP) NJ DKQP TX TRRP-13
NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
[signature]	3/10/17	1625	[signature]		
			[signature]	3-11-17	0950

EDD Required? Yes No
If yes, format: ____

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS ____ FedEx ____ Other ____

Temperature upon receipt 2.6 °C

eurofins | Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID: 177896

Group Number(s): 1770607

Client: Haley and Aldrich

Delivery and Receipt Information

Delivery Method:	Fed Ex	Arrival Timestamp:	03/11/2017 9:50
Number of Packages:	1	Number of Projects:	1
State/Province of Origin:	GA		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	2
Paperwork Enclosed:	Yes	Trip Blank Type:	HCl
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Melvin Sanchez (8943) at 16:12 on 03/11/2017

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT131	2.8	DT	Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425
T 717-656-2300
F 717-656-2681
www.LancasterLabs.com

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	milliliter(s)
cfu	colony forming units	**MPN**	Most Probable Number
CP Units	cobalt-chloroplatinate units	**N.D.**	none detected
F	degrees Fahrenheit	**ng**	nanogram(s)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…
W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

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

March 24, 2017

D McDonnell
Haley & Aldrich
400 Augusta St
Suite 130
Greenville, SC 29601

RE: **FORMER GENERAL TIRE**
Pace Workorder: 21956

Dear D McDonnell:

Enclosed are the analytical results for sample(s) received by the laboratory on Friday, March 10, 2017. 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,

Ruth Welsh 03/24/2017
Ruth.Welsh@pacelabs.com

Customer Service Representative

Enclosures

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

Total Number of Pages 14

CERTIFICATE OF ANALYSIS

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:	West Virginia Department of Environmental Protection, Division of Water and Waste Management
Accreditation ID:	395
Scope:	Non-Potable Water
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: 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, PAES is accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

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SAMPLE SUMMARY

Workorder: 21956 FORMER GENERAL TIRE

Lab ID	Sample ID	Matrix	Date Collected	Date Received
219560001	MW-16D	Water	3/9/2017 09:14	3/10/2017 11:30
219560002	MW-16I	Water	3/9/2017 09:35	3/10/2017 11:30
219560003	MP-3	Water	3/9/2017 10:21	3/10/2017 11:30
219560004	MP-7	Water	3/9/2017 10:42	3/10/2017 11:30
219560005	MP-8	Water	3/9/2017 11:24	3/10/2017 11:30

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ANALYTICAL RESULTS

Workorder: 21956 FORMER GENERAL TIRE

Lab ID: **219560001** Date Received: 3/10/2017 11:30 Matrix: Water

Sample ID: **MW-16D** Date Collected: 3/9/2017 09:14

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
EDonors - PAES								
Analysis Desc: AM21G		Analytical Method: AM21G						
Acetic Acid	**<5.0**	mg/l	5.0	0.33	1	3/23/2017 09:56	BW	n
Propionic Acid	**<5.0**	mg/l	5.0	0.052	1	3/23/2017 09:56	BW	n
Pyruvic Acid	**<5.0**	mg/l	5.0	0.14	1	3/23/2017 09:56	BW	n
Butyric Acid	**<5.0**	mg/l	5.0	0.055	1	3/23/2017 09:56	BW	n
Lactic Acid	**<10**	mg/l	10	0.98	1	3/23/2017 09:56	BW	n

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ANALYTICAL RESULTS

Workorder: 21956 FORMER GENERAL TIRE

Lab ID: **219560002** Date Received: 3/10/2017 11:30 Matrix: Water

Sample ID: **MW-16I** Date Collected: 3/9/2017 09:35

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
EDonors - PAES								
Analysis Desc: AM21G		Analytical Method: AM21G						
Acetic Acid	**420**	mg/l	5.0	0.33	1	3/23/2017 11:23	BW	n
Propionic Acid	**170**	mg/l	5.0	0.052	1	3/23/2017 11:23	BW	n
Pyruvic Acid	**<5.0**	mg/l	5.0	0.14	1	3/23/2017 11:23	BW	n
Butyric Acid	**120**	mg/l	5.0	0.055	1	3/23/2017 11:23	BW	n
Lactic Acid	**<10**	mg/l	10	0.98	1	3/23/2017 11:23	BW	n

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ANALYTICAL RESULTS

Workorder: 21956 FORMER GENERAL TIRE

Lab ID: **219560003** Date Received: 3/10/2017 11:30 Matrix: Water

Sample ID: **MP-3** Date Collected: 3/9/2017 10:21

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
EDonors - PAES								
Analysis Desc: AM21G		Analytical Method: AM21G						
Acetic Acid	**1400**	mg/l	25	1.7	5	3/23/2017 14:40	BW	d,n
Propionic Acid	**1700**	mg/l	25	0.26	5	3/23/2017 14:40	BW	d,n
Pyruvic Acid	**<5.0**	mg/l	5.0	0.14	1	3/23/2017 11:45	BW	n
Butyric Acid	**100**	mg/l	5.0	0.055	1	3/23/2017 11:45	BW	n
Lactic Acid	**<10**	mg/l	10	0.98	1	3/23/2017 11:45	BW	n

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ANALYTICAL RESULTS

Workorder: 21956 FORMER GENERAL TIRE

Lab ID: **219560004** Date Received: 3/10/2017 11:30 Matrix: Water

Sample ID: **MP-7** Date Collected: 3/9/2017 10:42

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
EDonors - PAES								
Analysis Desc: AM21G		Analytical Method: AM21G						
Acetic Acid	**170**	mg/l	5.0	0.33	1	3/23/2017 12:28	BW	n
Propionic Acid	**350**	mg/l	5.0	0.052	1	3/23/2017 12:28	BW	n
Pyruvic Acid	**<5.0**	mg/l	5.0	0.14	1	3/23/2017 12:28	BW	n
Butyric Acid	**74**	mg/l	5.0	0.055	1	3/23/2017 12:28	BW	n
Lactic Acid	**<10**	mg/l	10	0.98	1	3/23/2017 12:28	BW	n

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ANALYTICAL RESULTS

Workorder: 21956 FORMER GENERAL TIRE

Lab ID: **219560005** Date Received: 3/10/2017 11:30 Matrix: Water

Sample ID: **MP-8** Date Collected: 3/9/2017 11:24

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
EDonors - PAES								
Analysis Desc: AM21G		Analytical Method: AM21G						
Acetic Acid	**240**	mg/l	5.0	0.33	1	3/23/2017 13:13	BW	n
Propionic Acid	**58**	mg/l	5.0	0.052	1	3/23/2017 13:13	BW	n
Pyruvic Acid	**<5.0**	mg/l	5.0	0.14	1	3/23/2017 13:13	BW	n
Butyric Acid	**<5.0**	mg/l	5.0	0.055	1	3/23/2017 13:13	BW	n
Lactic Acid	**<10**	mg/l	10	0.98	1	3/23/2017 13:13	BW	n

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ANALYTICAL RESULTS QUALIFIERS

Workorder: 21956 FORMER GENERAL TIRE

DEFINITIONS/QUALIFIERS

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).
n	The laboratory does not hold NELAP/TNI accreditation for this method or analyte.
d	The analyte concentration was determined from a dilution.

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QUALITY CONTROL DATA

Workorder: 21956 FORMER GENERAL TIRE

QC Batch: EDON/3280 Analysis Method: AM21G

QC Batch Method: AM21G

Associated Lab Samples: 219560001, 219560002, 219560003, 219560004, 219560005

METHOD BLANK: 47651

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
EDonors				
Acetic Acid	mg/l	<5.0	5.0	n
Propionic Acid	mg/l	<5.0	5.0	n
Pyruvic Acid	mg/l	<5.0	5.0	n
Butyric Acid	mg/l	<5.0	5.0	n
Lactic Acid	mg/l	<10	10	n

LABORATORY CONTROL SAMPLE: 47652

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
EDonors						
Acetic Acid	mg/l	100	98	98	70-130	n
Propionic Acid	mg/l	100	97	97	70-130	n
Pyruvic Acid	mg/l	100	90	91	70-130	n
Butyric Acid	mg/l	100	97	97	70-130	n
Lactic Acid	mg/l	100	97	97	70-130	n

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 47653 47654 Original: 219560001

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
EDonors											
Acetic Acid	mg/l	1.4	100	95	95	94	94	70-130	0	20	n
Propionic Acid	mg/l	0.08	100	98	98	98	98	70-130	0	20	n
Pyruvic Acid	mg/l	0	100	97	96	97	96	70-130	1	20	n
Butyric Acid	mg/l	0.059	100	98	99	98	99	70-130	1	20	n
Lactic Acid	mg/l	0	100	97	94	97	94	70-130	3.1	20	n

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QUALITY CONTROL DATA QUALIFIERS

Workorder: 21956 FORMER GENERAL TIRE

QUALITY CONTROL PARAMETER QUALIFIERS

n	The laboratory does not hold NELAP/TNI accreditation for this method or analyte.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 21956 FORMER GENERAL TIRE

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
219560001	MW-16D			AM21G	EDON/3280
219560002	MW-16I			AM21G	EDON/3280
219560003	MP-3			AM21G	EDON/3280
219560004	MP-7			AM21G	EDON/3280
219560005	MP-8			AM21G	EDON/3280

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412-826-5245

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

21956

Page: 1 of 1

007598

Section A Required Client Information:

Company:	Haley and Aldrich
Address:	400 Augusta Street, St 430 Greenville, SC 29601
Email To:	mmiesfeldt@haleyaldrich.com
Phone:	Fax:
Requested Due Date/TAT:	Standard

Section B Required Project Information:

Report To:	Mack Miesfeldt
Copy To:	
Purchase Order No.:	128752-003
Project Name:	Former General Time
Project Number:	

Section C Invoice Information:

Attention:	Same as client
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER
UST RCRA OTHER _____

Site Location STATE: GA

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes MATRIX / CODE

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	TSP	BAK	Zinc Acetate & NaOH	Other	Analysis Test Y/N	Analysis Test: VFAs	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-16D	WT	G			3/9/17	914		2	X								Y	X		
2	MW-16I	WT	G			3/9/17	935		2	X								Y	X		
3	~~DUP~~ MP-3	WT	G			3/9/17	1021		2	X								Y	X		
4	MP-7	WT	G			3/9/17	1042		2	X								Y	X		
5	MP-8	WT	G			3/9/17	1129		2	X								Y	X		
6																					
7																					
8																					
9																					
10																					
11																					
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	[signature] HKA	3/9/17	1730	[signature] PACE	3.10.17	1130	2	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Cooler Receipt Form

Client Name: Haley & Aldrich Project: Frm. General Lab Work Order: 21956
Time

A. Shipping/Container Information (circle appropriate response)

Courier: (FedEx) UPS USPS Client Other:_____ Air bill Present: (Yes) No

Tracking Number: 8102 86687675

Custody Seal on Cooler/Box Present: Yes (No) Seals Intact: Yes No

Cooler/Box Packing Material: (Bubble Wrap) Absorbent Foam Other:_____

Type of Ice: (Wet) Blue None Ice Intact: (Yes) Melted

Cooler Temperature: 2°C Radiation Screened: Yes (No) Chain of Custody Present: (Yes) No

Comments:_____

B. Laboratory Assignment/Log-in (check appropriate response)

	YES	NO	N/A	Comment Reference non-Conformance
Chain of Custody properly filled out	✓			
Chain of Custody relinquished	✓			
Sampler Name & Signature on COC			✓	
Containers intact	✓			
Were samples in separate bags	✓			
Sample container labels match COC Sample name/date and time collected	✓			
Sufficient volume provided	✓			
PAES containers used	✓			
Are containers properly preserved for the requested testing? (as labeled)			✓	
If an unknown preservation state, were containers checked? Exception: VOA's coliform			✓	If yes, see pH form.
Was volume for dissolved testing field filtered, as noted on the COC? Was volume received in a preserved container?			✓	

Comments:_____

Cooler contents examined/received by: LG Date: 3.10.17

Project Manager Review: ZDM Date: 3/13/17

APPENDIX B

Field Sampling Forms

HALEY ALDRICH

SURFACE WATER SAMPLE LOG

PROJECT	Former General Time Facility	**H&A FILE NO.**	128752-003
LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Techology Corporation	**FIELD REP**	Sean Lewis
SUBCONTRACTOR	None	**DATE**	10/19/17

Sample ID: SW-1
Date: 10/19/16
Time: 1154
Weather: 60s Sunny

DESCRIPTION OF SAMPLE LOCATION:

Name of Water Body: North Oconee River
Depth of Water: 3.0 ft
Velocity: 0.5 ft
Other Comments: Sample taken 50 feet down stream of tributary
Substrate Description: Sand and Gravel
Location: Near mw-11 cluster
Description of Nearby Vegetation: Trees and Shrubs

FIELD PARAMETERS:

Sample Method: Grab sample using disposible poly cup.
Sample Description:

Temperature (°C/°F): 20.49
pH: 6.62
Dissolved Oxygen (mg/L): 20.38
Conductivity (mS/cm): 0.126
Turbidity (NTU): 11.7
ORP (mV): 144

CONTAINER DESCRIPTION:

Laboratory: Eurofin- Lancaster

Bottle Type	Analysis	Preservative
40 mL VOA	VOCs*	HCl

Notes:

*Site specific COC

SURFACE WATER SAMPLE LOG

PROJECT	Former General Time Facility	**H&A FILE NO.**	128752-003
LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Techology Corporation	**FIELD REP**	S. Lewis
SUBCONTRACTOR	None	**DATE**	10-19-17

Sample ID: SW-2
Date: 10/19/16
Time: 1304
Weather: 60s Sunny

DESCRIPTION OF SAMPLE LOCATION:

Name of Water Body: North Oconee River
Depth of Water: 3.0 ft
Velocity: 0.5 A
Other Comments:
Substrate Description: Sand & Gravel
Location: Bridge near MW-15I
Description of Nearby Vegetation: Trees and shrubs

FIELD PARAMETERS:

Sample Method: Grab sample using poly cup
Sample Description:

Temperature (°C/°F): 23.29
pH: 6.42
Dissolved Oxygen (mg/L): 12.61
Conductivity (mS/cm): 0.114
Turbidity (NTU): 21.4
ORP (mV): 179

CONTAINER DESCRIPTION:

Laboratory: Eurofin - Lancaster

Bottle Type	Analysis	Preservative
40 mL VOA	VOCs*	HCl

Notes:

*Site specific COC

LOW FLOW SAMPLING FORM

PROJECT	Former General Time Facility	**H&A FILE NO.**	38111-011
LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Technology Corporation	**FIELD REP**	J. Yonts
CONTRACTOR	None	**DATE**	12/22/16

Sampling Data:

Well ID:	MW-16I	Well Depth:	30.68 ft	Initial Depth To Water:	22.10 ft	Purging Device:	Peristaltic
Start time:	1025	Depth To Top Of Screen:	20.68 ft	Depth Of Pump Intake:	~25.0 ft	Tubing Present In Well:	☑ Yes ☐ No
Finish Time:	1155	Depth To Bottom Of Screen:	30.68 ft	Measuring Point:	Top of Casing	Tubing Type:	LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (mL/min) or (gal/min)	Purge Rate (mL/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temp-erature (°F) or (°C)	pH	Conduct-ivity (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP/eH (mV)	Comments
Stabilized within →		[100 mL/min] to [500 mL/min]		–	N/A	[+/- 0.1]	[+/- 3%]	[+/- 10%]	[+/- 10%]	[+/- 10]	
1029	22.46		300	0	21.32	5.69	3.64	1.15	100	21	Sample for:
1034	22.52		300		21.09	5.90	3.50	1.75	73.4	-16	VOCs* (Eurofins)
1039	22.56		150		20.96	5.97	3.44	1.86	62.0	-27	Sulfate (Eurofins)
1044	22.59		200		20.69	6.05	3.40	1.89	52.2	-37	Iron, Ferrous (Eurofins)
1049	22.62		200		20.51	6.10	3.38	1.86	47.4	-43	Iron, Total (Eurofins)
1054	22.64		200		20.49	6.16	3.32	1.85	41.9	-48	Total Organic Carbon (TOC) (Eurofins)
1059	22.68		200		20.49	6.19	3.24	1.87	32.3	-51	Volatile Fatty Acids (VFA) (Pace Analytical)
1104	22.70		200		20.48	6.23	3.13	1.71	28.4	-57	- Foul smelling water
1109	22.71		200		20.47	6.26	3.07	1.71	28.0	-59	- Sheen on top of water
1114	22.73		200		20.45	6.31	3.02	1.69	26.1	-66	
1119	22.74		200		20.42	6.34	3.02	1.60	24.1	-68	*Site Specific VOCs:
1124	22.75		200		20.41	6.35	3.00	1.58	24.2	-70	1,1-Dichloroethane
1129	22.77		200		20.38	6.37	2.99	1.57	22.8	-71	cis-1,2-Dichloroethene
1134	22.79		200	↓	20.38	6.38	2.97	1.55	21.0	-72	trans-1,2-Dichloroethene
1139	22.80		200	~14.0	20.37	6.40	2.97	1.54	20.6	-73	Methylene Chloride
											1,1,2-Trichloroethane
		Parameters stable, begin sampling									Trichloroethene
		sample time @ 1139									Vinyl Chloride

well volume = 3.14 (PI) x radius^2 x height of water column. 2 in well = 0.163 gal/ft, 3 in = 0.367 gal/ft 4 in = 0.653 gal/ft, 6 in = 1.469 gal/ft, 1 cu. ft. = 7.48 gal, 1 gal = 3.785 L, 1L = 0.264 gal, 0.5L/min = 0.132 gal/min

40

Location Carpenter Date 1-26-16

Project / Client Athens, GA

0545: Leave for site
0730: Arrive onsite, begin mobilizing equipment into warehouse
0817: Begin purge MW-16I
0847: Sampled MW-16I
0852: Begin purge MW-16D
0927: Sampled MW-16D
0945: Begin purge MP-3
1021: Sampled MP-3
1035: Begin purge MP-8
1112: Sampled MP-8
1130: Begin purge MP-7
1210: Sampled MP-7, begin demobing equipment from building and completing chain.
1310: mobilizing to gas station for ice and gas
1345: Leave for office
1525: Arrive at office, begin unloading equipment
1615: Dropped samples off at FedEx

Sean Lewis

LOW FLOW SAMPLING FORM

PROJECT	Former General Time Facility	**H&A FILE NO.**	38111-011
LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Technology Corporation	**FIELD REP**	S. Lewis
CONTRACTOR	None	**DATE**	1-26-17

Sampling Data:

Well ID:	MW-16I	Well Depth:	30.68 ft	Initial Depth To Water:	20.61 ft	Purging Device:	Peristaltic
Start time:	0815	Depth To Top Of Screen:	20.68 ft	Depth Of Pump Intake:	25.00 ft	Tubing Present In Well:	☑ Yes ☐ No
Finish Time:	0855	Depth To Bottom Of Screen:	30.68 ft	Measuring Point:	Top of Casing	Tubing Type:	LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (mL/min) or (gal/min)	Purge Rate (mL/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temp-erature (°F) or (°C)	pH	Conduct-ivity (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP/eH (mV)	Comments
Stabilized within →		[100 mL/min] to [500 mL/min]		–	N/A	[+/- 0.1]	[+/- 3%]	[+/- 10%]	[+/- 10%]	[+/- 10]	
0817	20.88	150	150		18.32	6.16	2.61	5.47	66.8	-101	Sample for:
0822	21.02	150	150		19.29	6.21	2.56	3.59	47.6	-121	VOCs* (Eurofins)
0827	21.12	150	150		19.64	6.21	2.52	2.50	57.5	-129	~~Sulfate (Eurofins)~~
0832	21.27	150	150		19.82	6.22	2.47	2.04	57.5	-131	~~Iron, Ferrous (Eurofins)~~
0837	21.30	150	150		19.83	6.22	2.39	1.80	65.5	-134	~~Iron, Total (Eurofins)~~
0842	21.30	150	150		19.79	6.25	2.34	1.75	66.7	-137	~~Total Organic Carbon (TOC) (Eurofins)~~
0847	21.31	150	150		19.78	6.24	2.33	1.72	68.2	-139	Volatile Fatty Acids (VFA) (Pace Analytical)
0847	Start Sample										-Cloudy water
											-Strong sewer odor
											*Site Specific VOCs:
											~~1,1-Dichloroethane~~
											cis-1,2-Dichloroethene
											~~trans-1,2-Dichloroethene~~
											~~Methylene Chloride~~
											~~1,1,2-Trichloroethane~~
											Trichloroethene
											Vinyl Chloride

well volume = 3.14 (PI) x radius^2 x height of water column. 2 in well = 0.163 gal/ft. 3 in = 0.367 gal/ft 4 in = 0.653 gal/ft. 6 in = 1.469 gal/ft. 1 cu. ft. = 7.48 gal. 1 gal = 3.785 L. 1L = 0.264 gal. 0.5L/min = 0.132 gal/min

LOW FLOW SAMPLING FORM

PROJECT	Former General Time Facility	**H&A FILE NO.**	38111-011
LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Technology Corporation	**FIELD REP**	S. Cavis
CONTRACTOR	None	**DATE**	1-26-18

Sampling Data:

Well ID:	MW-16D	Well Depth:	56.48 ft	Initial Depth To Water:	20.58 ft	Purging Device:	Peristaltic
Start time:	0850	Depth To Top Of Screen:	46.48 ft	Depth Of Pump Intake:	51.00 ft	Tubing Present In Well:	☐ Yes ☐ No
Finish Time:	0935	Depth To Bottom Of Screen:	56.48 ft	Measuring Point:	Top of Casing	Tubing Type:	LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (mL/min) or (gal/min)	Purge Rate (mL/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temp-erature (°F) or (°C)	pH	Conduct-ivity (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP/eH (mV)	Comments
Stabilized within →		[100 mL/min] to [500 mL/min]		--	N/A	[+/- 0.1]	[+/- 3%]	[+/- 10%]	[+/- 10%]	[+/- 10]	
0852	20.60	150	150		19.51	6.40	0.660	3.49	22.9	-60	Sample for:
0857	20.68	150	150		19.71	6.18	0.238	2.63	1.8	5	VOCs* (Eurofins)
0902	20.73	150	150		19.76	6.14	0.201	2.62	2.3	14	~~Sulfate (Eurofins)~~
0907	20.76	150	150		19.70	6.05	0.148	2.56	0.3	39	~~Iron, Ferrous (Eurofins)~~
0912	20.76	150	150		19.68	6.00	0.125	2.52	0.3	65	~~Iron, Total (Eurofins)~~
0917	20.76	150	150		19.68	5.99	0.121	2.48	0.3	85	~~Total Organic Carbon (TOC) (Eurofins)~~
0922	20.76	150	150		19.76	5.98	0.120	2.44	0.3	90	- Clear water
0927	20.76	150	150		19.73	5.98	0.118	2.41	0.3	95	
Start Sample											
											*Site Specific VOCs:
											~~1,1-Dichloroethane~~
											cis-1,2-Dichloroethene
											~~trans-1,2-Dichloroethene~~
											~~Methylene Chloride~~
											~~1,1,2-Trichloroethane~~
											Trichloroethene
											Vinyl Chloride

well volume = 3.14 (PI) x radius^2 x height of water column. 2 in well = 0.163 gal/ft, 3 in = 0.367 gal/ft 4 in = 0.653 gal/ft, 6 in = 1.469 gal/ft, 1 cu. ft. = 7.48 gal, 1 gal = 3.785 L, 1L = 0.264 gal, 0.5L/min = 0.132 gal/min

LOW FLOW SAMPLING FORM

PROJECT	Former General Time Facility	**H&A FILE NO.**	38111-011
LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Technology Corporation	**FIELD REP**	S. Lewis
CONTRACTOR	None	**DATE**	1-26-17

Sampling Data:

Well ID:	MP-3	Well Depth:	~30.0 ft	Initial Depth To Water:	17.10 ft	Purging Device:	Peristaltic
Start time:	0945	Depth To Top Of Screen:	~20.0 ft	Depth Of Pump Intake:	25.00 ft	Tubing Present In Well:	☐ Yes ☐ No
Finish Time:	1025	Depth To Bottom Of Screen:	~30.0 ft	Measuring Point:	Top of Casing	Tubing Type:	LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (mL/min) or (gal/min)	Purge Rate (mL/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temp-erature (°F) or (°C)	pH	Conduct-ivity (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP/eH (mV)	Comments
Stabilized within →		[100 mL/min] to [500 mL/min]		--	N/A	[+/- 0.1]	[+/- 3%]	[+/- 10%]	[+/- 10%]	[+/- 10]	
0950	19.35	250	250		18.71	6.94	3.90	2.32	72.3	-146	Sample for:
0950	17.95	150	150		19.02	6.97	4.60	1.42	42.1	-158	VOCs* (Eurofins)
0955	18.05	150	150		19.48	6.96	4.68	1.30	42.8	-164	~~Sulfate (Eurofins)~~
1000	18.06	150	150		19.65	6.95	4.75	1.20	37.8	-165	~~Iron, Ferrous (Eurofins)~~
1005	18.06	150	150		19.68	6.95	4.82	1.12	29.6	-167	~~Iron, Total (Eurofins)~~
1010	18.07	150	150		19.70	6.93	4.92	1.04	22.7	-166	~~Total Organic Carbon (TOC) (Eurofins)~~
1015	18.07	150	150		19.69	6.93	4.96	0.99	18.5	-166	Volatile Fatty Acids (VFA) (Pace Analytical)
1020	18.07	150	150		19.70	6.93	4.97	0.96	16.9	-166	- Strong sewer odor
Start	Sample										
											*Site Specific VOCs:
											~~1,1-Dichloroethane~~
											cis-1,2-Dichloroethene
											~~trans-1,2-Dichloroethene~~
											Methylene Chloride
											~~1,1,2-Trichloroethane~~
											Trichloroethene
											Vinyl Chloride

well volume = 3.14 (PI) x radius^2 x height of water column. 2 in well = 0.163 gal/ft. 3 in = 0.367 gal/ft 4 in = 0.653 gal/ft. 6 in = 1.469 gal/ft. 1 cu. ft. = 7.48 gal. 1 gal = 3.785 L. 1L = 0.264 gal. 0.5L/min = 0.132 gal/min

LOW FLOW SAMPLING FORM

PROJECT	Former General Time Facility	**H&A FILE NO.**	38111-011
LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Technology Corporation	**FIELD REP**	S. Lewis
CONTRACTOR	None	**DATE**	1-26-17

Sampling Data:

Well ID:	MP-8	Well Depth:	~30.0 ft	Initial Depth To Water:	unable to gauge ft	Purging Device:	Peristaltic
Start time:	1038	Depth To Top Of Screen:	~20.0 ft	Depth Of Pump Intake:	25.00 ft	Tubing Present In Well:	☐ Yes ☐ No
Finish Time:	1126	Depth To Bottom Of Screen:	~30.0 ft	Measuring Point:	Top of Casing	Tubing Type:	LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (mL/min) or (gal/min)	Purge Rate (mL/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temp-erature (°F) or (°C)	pH	Conduct-ivity (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP/eH (mV)	Comments
Stabilized within →		[100 mL/min] to [500 mL/min]		--	N/A	[+/- 0.1]	[+/- 3%]	[+/- 10%]	[+/- 10%]	[+/- 10]	
1042	—	150	150		18.82	6.33	1.70	1.72	88.0	-28	Sample for:
1047	—	150	150		19.29	6.27	1.60	1.31	75.2	-114	VOCs* (Eurofins)
1052	—	150	150		19.41	6.30	1.55	1.01	65.8	-133	~~Sulfate (Eurofins)~~
1057	—	150	150		19.41	6.32	1.55	0.86	56.8	-151	~~Iron, Ferrous (Eurofins)~~
1102	—	150	150		19.44	6.33	1.55	0.81	42.5	-158	~~Iron, Total (Eurofins)~~
1107	—	150	150		19.44	6.36	1.55	0.79	44.8	-164	Total Organic Carbon (TOC) (Eurofins)
1112	—	150	150		19.46	6.37	1.55	0.76	42.2	-167	~~Volatile Fatty Acids (VFA) (Pace Analytical)~~
											-black staining on tubing
											-Chemical odor
											-unable to gauge while purging due to
											*Site Specific VOCs: well diam
											~~1,1-Dichloroethane~~
											cis-1,2-Dichloroethene
											~~trans-1,2-Dichloroethene~~
											~~Methylene Chloride~~
											~~1,1,2-Trichloroethane~~
											Trichloroethene
											Vinyl Chloride
											-Strong odor

well volume = 3.14 (PI) x radius^2 x height of water column. 2 in well = 0.163 gal/ft. 3 in = 0.367 gal/ft 4 in = 0.653 gal/ft. 6 in = 1.469 gal/ft. 1 cu. ft. = 7.48 gal. 1 gal = 3.785 L. 1L = 0.264 gal. 0.5L/min = 0.132 gal/min

LOW FLOW SAMPLING FORM

PROJECT	Former General Time Facility	**H&A FILE NO.**	38111-011
LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Technology Corporation	**FIELD REP**	S. Lewis
CONTRACTOR	None	**DATE**	1-26-17

Sampling Data:

Well ID:	MP-7	Well Depth:	~30.0 ft	Initial Depth To Water:	18.92 ft	Purging Device:	Peristaltic
Start time:	1127	Depth To Top Of Screen:	~20.0 ft	Depth Of Pump Intake:	25.00 ft	Tubing Present In Well:	☐ Yes ☐ No
Finish Time:	1215	Depth To Bottom Of Screen:	~30.0 ft	Measuring Point:	Top of Casing	Tubing Type:	LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (mL/min) or (gal/min)	Purge Rate (mL/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temp-erature (°F) or (°C)	pH	Conduct-ivity (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP/eH (mV)	Comments
Stabilized within →		[100 mL/min] to [500 mL/min]		–	N/A	[+/- 0.1]	[+/- 3%]	[+/- 10%]	[+/- 10%]	[+/- 10]	
1130	—	150	150		18.56	6.61	4.08	1.81	392	-149	Sample for:
1135	—	150	150		19.15	6.65	4.21	1.08	346	-163	VOCs* (Eurofins)
1140	—	150	150		19.19	6.67	3.92	0.73	210	-170	~~Sulfate (Eurofins)~~
1145	—	150	150		19.44	6.67	3.58	0.63	160	-168	Iron, Ferrous (Eurofins)
1150	—	150	150		19.76	6.65	3.34	0.62	113	-169	~~Iron, Total (Eurofins)~~
1155	—	150	150		19.90	6.65	3.14	0.64	92.3	-171	~~Total Organic Carbon (TOC) (Eurofins)~~
1200	—	150	150		20.12	6.65	3.09	0.63	87.1	-172	Volatile Fatty Acids (VFA) (~~Pace~~ Analytical)
1205	—	150	150		20.25	6.65	3.06	0.62	85.3	-174	- unable to gauge while purge due to well diam.
1210	—	150	150		20.37	6.65	3.04	0.62	82.7	-178	- black staining on tubing
Start	Sample										- Strong Sewer odor
											*Site Specific VOCs:
											~~1,1-Dichloroethane~~
											cis-1,2-Dichloroethene
											~~trans-1,2-Dichloroethene~~
											~~Methylene Chloride~~
											~~1,1,2-Trichloroethane~~
											Trichloroethene
											Vinyl Chloride

well volume = 3.14 (PI) x radius^2 x height of water column. 2 in well = 0.163 gal/ft, 3 in = 0.367 gal/ft 4 in = 0.653 gal/ft, 6 in = 1.469 gal/ft, 1 cu. ft. = 7.48 gal, 1 gal = 3.785 L, 1L = 0.264 gal, 0.5L/min = 0.132 gal/min

TABLE II
GROUNDWATER ELEVATION DATA
CARPENTER - GENERAL TIME FACILITY
ATHENS, GEORGIA

Well Identifier	Date of Measurement	Time	Reference Point Elevation	Screened Interval (feet)	Depth to Water (feet)	Static Water Level Elevation (feet)	Notes
MW-1S	3/6/17	1111	641.3	14.5 - 4.5	7.50		
MW-1I	3/6/17	1113	641.1	25 - 20	7.36		
MW-2S	3/6/17	1059	637.3	20 - 10	17.83		
MW-2I	3/6/17	1100	637.4	86.5 - 76.5	18.83		
MW-2D	3/6/17	1355	635.5	226.5 - 216.5	22.56		
MW-3I	3/6/17	1115	639.7	99.5 - 89.5	16.74		
MW-5I	3/6/17	1310	623.5	41.5 - 31.5	11.78		
MW-6I	3/6/17	1313	622.8	71 - 61	10.00		
MW-7I	3/6/17	1326	619.1	36.5 - 26.5	9.05		
MW-8I	3/6/17	1322	618.7	15 - 5	10.07		
MW-9I	3/6/17	1320	613.2	54.5 - 44.5	6.20		
MW-9D	3/6/17	1319	613.4	201.4 - 181.4	11.28		
MW-11S	3/6/17	1334	611.0	13 - 3	8.47		
MW-11I	3/6/17	1333	610.9	32 - 22	8.37		
MW-11D	3/6/17	1332	611.9	287.3 - 277.3	9.02		
MW-16I	3/6/17	1057	643.6	30 - 20	20.56		
MW-16D	3/6/17	1056	643.6	57 - 47	20.57		
RW-1	3/6/17	1102	639.7	46.5 - 26.5	19.28		
RW-2	3/6/17	1104	639.2	90 - 70	19.48		
RW-3	3/6/17	1354	633.9	90 - 70	15.27		
RW-4	3/6/17	1351	633.7	95 - 75	14.17		

LOW FLOW SAMPLING FORM

PROJECT	Former General Time Facility	**H&A FILE NO.**	128752-003
LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Technology Corporation	**FIELD REP**	S. Lewis
CONTRACTOR	None	**DATE**	3/6/17

Sampling Data:

Well ID:	MW-1S	Well Depth:	14.5 ft	Initial Depth To Water:	7.50 ft	Purging Device:	Peri
Start time:	~~1425~~ 1432	Depth To Top Of Screen:	9.5 ft	Depth Of Pump Intake:	8.00 ft	Tubing Present In Well:	☐ Yes ☑ No
Finish Time:	~~1438~~ 1520	Depth To Bottom Of Screen:	14.5 ft	Measuring Point:	TOC	Tubing Type:	LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (mL/min) or (gal/min)	Purge Rate (mL/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temp-erature (°F) or (°C)	pH	Conduct-ivity (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP/eH (mV)	Comments
Stabilized within →		[100 mL/min] to [500 mL/min]		--	N/A	[+/- 0.1]	[+/- 3%]	[+/- 10%]	[+/- 10%]	[+/- 10]	
1435	7.65	100	100	~~0.00~~	20.79	5.86	0.031	1.81	800	143	Sample for:
1440	7.62	100	100		19.67	5.04	0.034	1.38	717	208	VOCs* (Eurofins)
1446	7.63	100	100	1.75	19.62	5.04	0.034	1.31	683	210	- there appears to be soil
1450	7.65	150	150	2.0	19.50	5.08	0.030	1.22	635	206	buildup in well, had to break
1455	7.65	150	150	2.5	19.52	5.09	0.030	1.18	584	204	through surface with water
1500	7.65	150	150	~~3.50~~	20.62	5.36	0.028	1.44	92.1	200	meter before we could get a
1505	7.65	150	150	4.25	20.99	5.18	0.028	1.16	86.5	209	water level &
1510	7.65	150	150	5.00	21.23	5.20	0.028	1.10	85.1	203	- removed some of the soil
1515	7.65	150	150	5.75	21.27	5.22	0.028	1.08	F3.4	199	coming up before connecting to
											flow through.
											*Site Specific VOCs: - possible residuals
											1,1-Dichloroethane in water
											cis-1,2-Dichloroethene
											trans-1,2-Dichloroethene
											Methylene Chloride
											1,1,2-Trichloroethane
											Trichloroethene
											Vinyl Chloride

well volume = 3.14 (PI) x radius^2 x height of water column. 2 in well = 0.163 gal/ft. 3 in = 0.367 gal/ft 4 in = 0.653 gal/ft. 6 in = 1.469 gal/ft. 1 cu. ft. = 7.48 gal. 1 gal = 3.785 L. 1L = 0.264 gal. 0.5L/min = 0.132 gal/min

LOW FLOW SAMPLING FORM

PROJECT	Former General Time Facility	**H&A FILE NO.**	128752-003
LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Technology Corporation	**FIELD REP**	J. Yonts
CONTRACTOR	None	**DATE**	3/6/17

Sampling Data:

Well ID:	MW-11	Well Depth:	25.27 ft	Initial Depth To Water:	7.36 ft	Purging Device:	Peristaltic
Start time:	1423	Depth To Top Of Screen:	15.27 ft	Depth Of Pump Intake:	~20 ft	Tubing Present In Well:	☐ Yes ☒ No
Finish Time:	1510	Depth To Bottom Of Screen:	25.27 ft	Measuring Point:	TOC	Tubing Type:	LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (mL/min) or (gal/min)	Purge Rate (mL/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temp-erature (°F) or (°C)	pH	Conduct-ivity (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP/eH (mV)	Comments
Stabilized within →		[100 mL/min] to [500 mL/min]		--	N/A	[+/- 0.1]	[+/- 3%]	[+/- 10%]	[+/- 10%]	[+/- 10]	
1430	7.44			0	21.35	6.41	0.076	5.90	0.00	163	Sample for:
1435	7.43		100	0.5	20.81	5.91	0.072	5.64	0.00	185	VOCs* (Eurofins)
1440	7.43		100	1.0	20.58	5.64	0.069	5.64	0.00	203	
1445	7.43		100		20.41	5.83	0.067	5.66	0.00	198	
1450	7.44		100	2.0	20.06	5.78	0.063	5.60	0.00	199	
1455	7.44		100		19.84	5.80	0.062	5.62	0.00	200	
1500	7.44		100	3.0	19.87	5.83	0.061	5.61	0.00	198	
	Parameters stable.										
	Sample time @ 1500										
											*Site Specific VOCs:
											1,1-Dichloroethane
											cis-1,2-Dichloroethene
											trans-1,2-Dichloroethene
											Methylene Chloride
											1,1,2-Trichloroethane
											Trichloroethene
											Vinyl Chloride

well volume = 3.14 (PI) x radius^2 x height of water column. 2 in well = 0.163 gal/ft, 3 in = 0.367 gal/ft 4 in = 0.653 gal/ft, 6 in = 1.469 gal/ft, 1 cu. ft. = 7.48 gal, 1 gal = 3.785 L, 1L = 0.264 gal, 0.5L/min = 0.132 gal/min

LOW FLOW SAMPLING FORM

PROJECT	Former General Time Facility	**H&A FILE NO.**	128752-003
LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Technology Corporation	**FIELD REP**	J. Vonts
CONTRACTOR	None	**DATE**	3/7/17

Sampling Data:

Well ID:	MW-2S	Well Depth:	20.2 ft	Initial Depth To Water:	17.77 ft	Purging Device:	Peristaltic
Start time:	1450	Depth To Top Of Screen:	10.2 ft	Depth Of Pump Intake:	~19.0 ft	Tubing Present In Well:	☐ Yes ☒ No
Finish Time:	1531	Depth To Bottom Of Screen:	20.2 ft	Measuring Point:	TOC	Tubing Type:	LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (mL/min) or (gal/min)	Purge Rate (mL/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temp-erature (°F) or (°C)	pH	Conduct-ivity (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP/eH (mV)	Comments
Stabilized within →		[100 mL/min] to [500 mL/min]		--	N/A	[+/- 0.1]	[+/- 3%]	[+/- 10%]	[+/- 10%]	[+/- 10]	
1455	18.00			0	23.08	6.15	0.109	3.86	393	215	Sample for:
1500	18.05				22.28	5.93	0.111	3.54	351	218	VOCs* (Eurofins)
1505	18.18		100	1.0	20.12	6.14	0.115	3.59	15.3	212	
1510	18.19				19.66	6.01	0.116	3.54	13.8	219	
1515	18.22		100	2.0	19.00	5.97	0.115	3.36	12.5	227	
1520	18.24				19.42	6.03	0.116	3.35	12.1	223	
1525	18.26		100	3.0	19.35	6.00	0.116	3.35	11.8	223	
	Parameters stable, sample time @ 1525										
											*Site Specific VOCs:
											1,1-Dichloroethane
											cis-1,2-Dichloroethene
											trans-1,2-Dichloroethene
											Methylene Chloride
											1,1,2-Trichloroethane
											Trichloroethene
											Vinyl Chloride

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LOW FLOW SAMPLING FORM

PROJECT	Former General Time Facility	**H&A FILE NO.**	128752-003
LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Technology Corporation	**FIELD REP**	S. Lewis
CONTRACTOR	None	**DATE**	3/7/17

Sampling Data:

Well ID:	MW-21	Well Depth:	86.5	ft	Initial Depth To Water:	17.52	ft	Purging Device:	Grunfos
Start time:	1452	Depth To Top Of Screen:	76.5	ft	Depth Of Pump Intake:	81.5	ft	Tubing Present In Well:	☐ Yes ☑ No
Finish Time:	1459	Depth To Bottom Of Screen:	86.5	ft	Measuring Point:	TOC		Tubing Type:	LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (mL/min) or (gal/min)	Purge Rate (mL/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temp-erature (°F) or (°C)	pH	Conduct-ivity (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP/eH (mV)	Comments
Stabilized within →		[100 mL/min] to [500 mL/min]		--	N/A	[+/- 0.1]	[+/- 3%]	[+/- 10%]	[+/- 10%]	[+/- 10]	
1455	19.41	200	200		21.63	6.37	0.107	11.61	—	135	Sample for:
1500	21.60	200	200		20.84	6.23	0.097	2.06	—	159	VOCs* (Eurofins)
1505	20.70	200	200		20.98	5.80	0.107	3.14	387	186	- turbidity meter not functioning
1510	20.25	200	200		20.99	5.73	0.099	1.57	283	187	- at 1503 generator ran out of
1515	21.42	200	200		21.02	5.79	0.096	1.18	213	117	gas
1520	22.18	200	200		20.91	5.39	0.098	1.29	88.5	195	
1525	22.21	200	200		20.45	5.23	0.097	1.27	80.2	203	
1530	22.21	200	200		20.40	5.20	0.097	1.28	72.9	204	
1535	22.21	200	200		20.33	5.18	0.097	1.27	49.5	205	
1540	22.22	200	200		20.29	5.15	0.096	1.26	45.5	207	
1545	22.22	200	200		20.21	5.14	0.096	1.25	43.9	208	*Site Specific VOCs:
Start	Sampling										1,1-Dichloroethane
											cis-1,2-Dichloroethene
											trans-1,2-Dichloroethene
											Methylene Chloride
											1,1,2-Trichloroethane
											Trichloroethene
											Vinyl Chloride

well volume = 3.14 (PI) x radius^2 x height of water column. 2 in well = 0.163 gal/ft. 3 in = 0.367 gal/ft 4 in = 0.653 gal/ft. 6 in = 1.469 gal/ft, 1 cu. ft. = 7.48 gal, 1 gal = 3.785 L, 1L = 0.264 gal, 0.5L/min = 0.132 gal/min

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LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Technology Corporation	**FIELD REP**	J. Yonts
CONTRACTOR	None	**DATE**	3/9/17

Sampling Data:

Well ID:	MW-2D	Well Depth:	226.5 ft	Initial Depth To Water:	15.80 ft	Purging Device:	Grundfos
Start time:	1335	Depth To Top Of Screen:	216.5 ft	Depth Of Pump Intake:	~221 ft	Tubing Present In Well:	☐ Yes ☒ No
Finish Time:	1423	Depth To Bottom Of Screen:	226.5 ft	Measuring Point:	TOC	Tubing Type:	LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (mL/min) or (gal/min)	Purge Rate (mL/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temp-erature (°F) or (°C)	pH	Conduct-ivity (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP/eH (mV)	Comments
Stabilized within →		[100 mL/min] to [500 mL/min]		--	N/A	[+/- 0.1]	[+/- 3%]	[+/- 10%]	[+/- 10%]	[+/- 10]	
1338	18.23		300	0	19.89	8.82	0.259	6.43	0.00	-85	Sample for:
1343	21.15		300		19.33	9.75	0.225	3.89	0.00	-91	VOCs* (Eurofins)
1348	22.65		300	3.0	19.40	9.81	0.226	2.60	3.79	-88	
1353	23.46		300		19.91	9.70	0.226	2.20	95.7	-88	
1358	24.35		300	6.0	19.95	9.20	0.228	1.16	2.02	-82	
1403	25.06		300		19.87	9.02	0.226	1.03	0.00	-83	
1408	25.30		300	9.0	20.15	8.95	0.227	0.95	0.00	-83	
1413	26.65		300		19.29	8.94	0.224	0.98	0.00	-86	
1418	27.21		300	12.0	19.27	8.97	0.225	0.99	0.00	-87	
											*Site Specific VOCs:
											1,1-Dichloroethane
											cis-1,2-Dichloroethene
											trans-1,2-Dichloroethene
											Methylene Chloride
											1,1,2-Trichloroethane
											Trichloroethene
											Vinyl Chloride

well volume = 3.14 (PI) x radius^2 x height of water column. 2 in well = 0.163 gal/ft, 3 in = 0.367 gal/ft 4 in = 0.653 gal/ft, 6 in = 1.469 gal/ft, 1 cu. ft. = 7.48 gal, 1 gal = 3.785 L, 1L = 0.264 gal, 0.5L/min = 0.132 gal/min

LOW FLOW SAMPLING FORM

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LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Technology Corporation	**FIELD REP**	J. Yonts
CONTRACTOR	None	**DATE**	3/8/17

Sampling Data:

Well ID:	MW-3I	Well Depth:	99.25 ft	Initial Depth To Water:	16.74 ft	Purging Device:	Grundfos
Start time:	1415	Depth To Top Of Screen:	89.25 ft	Depth Of Pump Intake:	~94 ft	Tubing Present In Well:	☐ Yes ☒ No
Finish Time:	1510	Depth To Bottom Of Screen:	99.25 ft	Measuring Point:	TOC	Tubing Type:	LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (mL/min) or (gal/min)	Purge Rate ~~(mL/min)~~ or (gal/min)	Cumulative Purge Vol. ~~(liters)~~ or (gal)	Temp-erature (°F) or ~~(°C)~~	pH	Conduct-ivity (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP/eH (mV)	Comments
Stabilized within →		[100 mL/min] to [500 mL/min]		--	N/A	[+/- 0.1]	[+/- 3%]	[+/- 10%]	[+/- 10%]	[+/- 10]	
1417	17.06			0	21.06	7.58	0.117	12.44	15.1	-6	Sample for:
1422	17.12		300		19.70	6.34	0.116	3.70	–	-9	VOCs* (Eurofins)
1427	17.17		300	3.0	20.41	6.04	0.116	3.71	–	19	
1432	17.20		300		20.57	6.06	0.114	3.49	–	16	Brown water color, 'stagnant'
1437	17.18		300	6.0	20.51	6.15	0.114	3.30	–	7	like odor, 'dirty'
1442	17.18		300		20.54	6.16	0.113	3.32	816	18	
1447	17.18		300	9.0	20.57	6.17	0.192	3.33	505	36	
1452	17.18		300		20.52	6.15	0.112	3.33	168	45	
1457	17.18		300	12.0	20.59	6.18	0.111	3.31	155	43	
1502	17.18		300	13.5	20.62	6.14	0.111	3.32	132	47	
											*Site Specific VOCs:
											1,1-Dichloroethane
											cis-1,2-Dichloroethene
											trans-1,2-Dichloroethene
											Methylene Chloride
											1,1,2-Trichloroethane
											Trichloroethene
											Vinyl Chloride

well volume = 3.14 (PI) x radius^2 x height of water column. 2 in well = 0.163 gal/ft, 3 in = 0.367 gal/ft 4 in = 0.653 gal/ft, 6 in = 1.469 gal/ft, 1 cu. ft. = 7.48 gal, 1 gal = 3.785 L, 1L = 0.264 gal, 0.5L/min = 0.132 gal/min

LOW FLOW SAMPLING FORM

PROJECT	Former General Time Facility	**H&A FILE NO.**	128752-003
LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Technology Corporation	**FIELD REP**	S Lewis
CONTRACTOR	None	**DATE**	3/7/17

Sampling Data:

Well ID:	MW-5I	Well Depth:	41.5 ft	Initial Depth To Water:	11.20 ft	Purging Device:	Peri
Start time:	1404	Depth To Top Of Screen:	31.5 ft	Depth Of Pump Intake:	36.5 ft	Tubing Present In Well:	☐ Yes ☒ No
Finish Time:	1435	Depth To Bottom Of Screen:	41.5 ft	Measuring Point:	TOC	Tubing Type:	LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (mL/min) or (gal/min)	Purge Rate (mL/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temp-erature (°F) or (°C)	pH	Conduct-ivity (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP/eH (mV)	Comments
Stabilized within →		[100 mL/min] to [500 mL/min]		--	N/A	[+/- 0.1]	[+/- 3%]	[+/- 10%]	[+/- 10%]	[+/- 10]	
1408	11.95	100	100		23.09	6.36	0.111	4.01	9.62	195	Sample for:
1413	11.95	100	100		23.61	6.67	0.114	2.61	8.10	178	VOCs* (Eurofins)
1418	11.97	100	100		22.97	6.68	0.115	2.20	7.36	172	
1423	11.97	100	100		22.92	6.70	0.116	2.13	6.10	169	
1428	11.97	100	100	✓	22.89	6.71	0.116	2.15	5.43	164	
Start	Sample			2.0							
											*Site Specific VOCs:
											1,1-Dichloroethane
											cis-1,2-Dichloroethene
											trans-1,2-Dichloroethene
											Methylene Chloride
											1,1,2-Trichloroethane
											Trichloroethene
											Vinyl Chloride

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LOW FLOW SAMPLING FORM

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CLIENT	Carpenter Technology Corporation	**FIELD REP**	J. Yonts
CONTRACTOR	None	**DATE**	3/7/17

Sampling Data:

Well ID:	MW-6I	Well Depth:	70.91 ft	Initial Depth To Water:	10.02 ft	Purging Device:	Grundfos
Start time:	1302	Depth To Top Of Screen:	60.91 ft	Depth Of Pump Intake:	~66 ft	Tubing Present In Well:	☐ Yes ☒ No
Finish Time:	1344	Depth To Bottom Of Screen:	70.91 ft	Measuring Point:	TOC	Tubing Type:	LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (mL/min) or (gal/min)	Purge Rate (mL/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temp-erature (°F) or (°C)	pH	Conduct-ivity (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP/eH (mV)	Comments
Stabilized within →		[100 mL/min] to [500 mL/min]		--	N/A	[+/- 0.1]	[+/- 3%]	[+/- 10%]	[+/- 10%]	[+/- 10]	
1304	10.45			0	20.04	5.97	0.096	8.95	17.0	221	Sample for:
1309	10.36		300		19.72	5.79	0.097	2.21	468	204	VOCs* (Eurofins)
1314	10.57		300	3.0	19.80	5.75	0.099	1.84	629	199	
1319	10.35		300		20.20	5.66	0.095	1.31	495	201	
1324	10.35		200		20.20	5.73	0.097	1.26	391	195	
1329	10.35		300	6.0	20.27	5.76	0.097	1.22	345	191	
1334	10.35		200		20.50	5.78	0.097	1.19	59.0	191	
1339	10.35		200	8.0	20.54	5.78	0.097	1.19	57.1	190	
	Parameters stable, sample time @ 1339										
											*Site Specific VOCs:
											1,1-Dichloroethane
											cis-1,2-Dichloroethene
											trans-1,2-Dichloroethene
											Methylene Chloride
											1,1,2-Trichloroethane
											Trichloroethene
											Vinyl Chloride

well volume = 3.14 (PI) x radius^2 x height of water column. 2 in well = 0.163 gal/ft, 3 in = 0.367 gal/ft 4 in = 0.653 gal/ft, 6 in = 1.469 gal/ft, 1 cu. ft. = 7.48 gal, 1 gal = 3.785 L, 1L = 0.264 gal, 0.5L/min = 0.132 gal/min

LOW FLOW SAMPLING FORM

PROJECT	Former General Time Facility	**H&A FILE NO.**	128752-003
LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Technology Corporation	**FIELD REP**	J. Vonts
CONTRACTOR	None	**DATE**	3/7/17

Sampling Data:

Well ID:	MW-7I	Well Depth:	36.5 ft	Initial Depth To Water:	9.28 ft	Purging Device:	Peristaltic
Start time:	1018	Depth To Top Of Screen:	26.5 ft	Depth Of Pump Intake:	~31 ft	Tubing Present In Well:	☐ Yes ☒ No
Finish Time:	1057	Depth To Bottom Of Screen:	36.5 ft	Measuring Point:	TOC	Tubing Type:	LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (mL/min) or (gal/min)	Purge Rate (mL/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temp-erature (°F) or (°C)	pH	Conduct-ivity (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP/eH (mV)	Comments
Stabilized within →		[100 mL/min] to [500 mL/min]		--	N/A	[+/- 0.1]	[+/- 3%]	[+/- 10%]	[+/- 10%]	[+/- 10]	
1022	9.38		200	0	18.76	7.31	0.142	0.91	9.42	133	Sample for:
1027	9.38		200	1.0	18.89	6.59	0.140	0.52	7.04	136	VOCs* (Eurofins)
1032	9.38		200	2.0	18.94	6.57	0.139	0.46	5.48	133	
1037	9.38		200	3.0	19.02	6.56	0.138	0.42	4.68	131	
1042	9.38		200	4.0	19.14	6.58	0.138	0.40	3.93	130	
1047	9.39		200	5.0	19.19	6.59	0.138	0.40	3.56	128	
1052	9.39		200	6.0	19.22	6.59	0.138	0.40	3.20	128	
	Parameters stable, sample time @					1052					
											*Site Specific VOCs:
											1,1-Dichloroethane
											cis-1,2-Dichloroethene
											trans-1,2-Dichloroethene
											Methylene Chloride
											1,1,2-Trichloroethane
											Trichloroethene
											Vinyl Chloride

well volume = 3.14 (PI) x radius^2 x height of water column. 2 in well = 0.163 gal/ft, 3 in = 0.367 gal/ft 4 in = 0.653 gal/ft, 6 in = 1.469 gal/ft, 1 cu. ft. = 7.48 gal, 1 gal = 3.785 L, 1L = 0.264 gal, 0.5L/min = 0.132 gal/min

LOW FLOW SAMPLING FORM

PROJECT	Former General Time Facility	**H&A FILE NO.**	128752-003
LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Technology Corporation	**FIELD REP**	S. Lewis
CONTRACTOR	None	**DATE**	3/7/17

Sampling Data:

Well ID:	MW-8I	Well Depth:	17.52 ft	Initial Depth To Water:	10.12 ft	Purging Device:	Peri
Start time:	1102	Depth To Top Of Screen:	7.52 ft	Depth Of Pump Intake:	12.50 ft	Tubing Present In Well:	☐ Yes ☑ No
Finish Time:	1140	Depth To Bottom Of Screen:	17.52 ft	Measuring Point:	TOC	Tubing Type:	LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (mL/min) or (gal/min)	Purge Rate (mL/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temp-erature (°F) or (°C)	pH	Conduct-ivity (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP/eH (mV)	Comments
Stabilized within →		[100 mL/min] to [500 mL/min]		--	N/A	[+/- 0.1]	[+/- 3%]	[+/- 10%]	[+/- 10%]	[+/- 10]	
1106	10.56	100	100		19.20	6.37	0.295	6.18	36.1	179	Sample for:
1111	10.60	100	100		18.77	6.07	0.301	5.88	29.2	188	VOCs* (Eurofins)
1116	10.66	100	100		18.70	6.10	0.302	5.68	24.7	192	
1121	10.71	100	100		18.70	6.10	0.301	5.40	21.5	195	
1126	10.76	100	100		18.72	6.11	0.299	5.22	19.7	196	
1131	10.78	100	100	↓	18.70	6.10	0.299	5.20	18.0	198	
1136	10.80	100	100	3.5	18.68	6.10	0.299	5.10	16.9	198	
Start time for sampling											
											*Site Specific VOCs:
											1,1-Dichloroethane
											cis-1,2-Dichloroethene
											trans-1,2-Dichloroethene
											Methylene Chloride
											1,1,2-Trichloroethane
											Trichloroethene
											Vinyl Chloride

well volume = 3.14 (PI) x radius^2 x height of water column. 2 in well = 0.163 gal/ft, 3 in = 0.367 gal/ft 4 in = 0.653 gal/ft, 6 in = 1.469 gal/ft, 1 cu. ft. = 7.48 gal, 1 gal = 3.785 L, 1L = 0.264 gal, 0.5L/min = 0.132 gal/min

LOW FLOW SAMPLING FORM

PROJECT	Former General Time Facility	**H&A FILE NO.**	128752-003
LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Technology Corporation	**FIELD REP**	S. Lewis
CONTRACTOR	None	**DATE**	3/7/17

Sampling Data:

Well ID:	MW-9I	Well Depth:	54.5 ft	Initial Depth To Water:	6.30 ft	Purging Device:	Peri
Start time:	0842	Depth To Top Of Screen:	44.5 ft	Depth Of Pump Intake:	49.5 ft	Tubing Present In Well:	☐ Yes ☒ No
Finish Time:	0930	Depth To Bottom Of Screen:	54.5 ft	Measuring Point:	TOC	Tubing Type:	LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (mL/min) or (gal/min)	Purge Rate (mL/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temp-erature (°F) or (°C)	pH	Conduct-ivity (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP/eH (mV)	Comments
Stabilized within →		[100 mL/min] to [500 mL/min]		--	N/A	[+/- 0.1]	[+/- 3%]	[+/- 10%]	[+/- 10%]	[+/- 10]	
0847	6.30	150	150		16.30	6.31	0.153	4.62	–	173	Sample for:
0852	6.31	150	150		16.76	6.32	0.151	4.72	–	173	VOCs* (Eurofins)
0857	6.31	150	150		17.33	6.35	0.148	4.31	–	176	– turbidity meter not working
0902	6.31	150	150		17.59	6.34	0.146	4.25	–	178	
0907	6.31	150	150		17.90	6.35	0.146	3.98	–	181	
0912	6.31	150	150		18.09	6.34	0.146	3.90	–	184	
0917	6.31	150	150		18.24	6.30	0.146	3.42	–	189	
0922	6.31	150	150	✓	18.31	6.27	0.147	3.19	–	193	
Start	Sample			5.0							
											*Site Specific VOCs:
											1,1-Dichloroethane
											cis-1,2-Dichloroethene
											trans-1,2-Dichloroethene
											Methylene Chloride
											1,1,2-Trichloroethane
											Trichloroethene
											Vinyl Chloride

well volume = 3.14 (PI) x radius^2 x height of water column. 2 in well = 0.163 gal/ft, 3 in = 0.367 gal/ft 4 in = 0.653 gal/ft, 6 in = 1.469 gal/ft, 1 cu. ft. = 7.48 gal, 1 gal = 3.785 L, 1L = 0.264 gal, 0.5L/min = 0.132 gal/min

LOW FLOW SAMPLING FORM

PROJECT	Former General Time Facility	**H&A FILE NO.**	128752-003
LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Technology Corporation	**FIELD REP**	J. Yonts
CONTRACTOR	None	**DATE**	3/7/17

Sampling Data:

Well ID:	MW-9D	Well Depth:	201.5 ft	Initial Depth To Water:	3.54 ft	Purging Device:	Grundfos
Start time:	845	Depth To Top Of Screen:	181.5 ft	Depth Of Pump Intake:	~191 ft	Tubing Present In Well:	☐ Yes ☒ No
Finish Time:	1000	Depth To Bottom Of Screen:	201.5 ft	Measuring Point:	TOC	Tubing Type:	LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (mL/min) or (gal/min)	Purge Rate (mL/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temp-erature (°F) or (°C)	pH	Conduct-ivity (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP/eH (mV)	Comments
Stabilized within →		[100 mL/min] to [500 mL/min]		--	N/A	[+/- 0.1]	[+/- 3%]	[+/- 10%]	[+/- 10%]	[+/- 10]	
848	6.42			0	14.88	6.79	0.225	9.14	18.3	234	Sample for:
853	7.40		200	1.0	14.77	7.59	0.224	9.48	13.0	206	VOCs* (Eurofins)
858	7.36		200	2.0	15.04	7.83	0.217	9.39	9.39	177	
903	9.24		200	3.0	15.46	8.52	0.222	8.36	8.60	90	Variability in pump spee
908	10.19		200	4.0	15.73	8.78	0.219	8.33	8.19	49	due to changing water level
913	11.62		200	5.0	16.08	8.99	0.220	7.26	11.1	12	
918	12.84		200	6.0	16.28	8.80	0.221	7.10	11.4	14	
923	13.38		200	7.0	16.52	9.07	0.224	6.74	11.7	-12	
928	16.61		200	8.0	16.92	9.20	0.223	6.20	12.0	-27	
933	18.57		200	9.0	17.20	9.18	0.222	5.73	11.9	-31	
938	20.18		200	10.0	17.40	9.28	0.221	5.33	11.6	-45	*Site Specific VOCs:
943	22.14		200	11.0	17.66	9.20	0.221	5.24	10.5	-42	1,1-Dichloroethane
948	23.50		200	12.0	17.86	9.16	0.220	5.21	10.5	-47	cis-1,2-Dichloroethene
											trans-1,2-Dichloroethene
	Parameters stable, sample time @ 948										Methylene Chloride
											1,1,2-Trichloroethane
											Trichloroethene
											Vinyl Chloride

well volume = 3.14 (PI) x radius^2 x height of water column. 2 in well = 0.163 gal/ft, 3 in = 0.367 gal/ft 4 in = 0.653 gal/ft, 6 in = 1.469 gal/ft, 1 cu. ft. = 7.48 gal, 1 gal = 3.785 L, 1L = 0.264 gal, 0.5L/min = 0.132 gal/min

LOW FLOW SAMPLING FORM

PROJECT	Former General Time Facility	**H&A FILE NO.**	128752-003
LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Technology Corporation	**FIELD REP**	S. Lewis
CONTRACTOR	None	**DATE**	3/8/17

Sampling Data:

Well ID:	MW-11S	Well Depth:	14.5 ft	Initial Depth To Water:	8.48 ft	Purging Device:	Peri
Start time:	~~1050~~ 1108	Depth To Top Of Screen:	4.5 ft	Depth Of Pump Intake:	9.5 ft	Tubing Present In Well:	☐ Yes ☒ No
Finish Time:	1155	Depth To Bottom Of Screen:	14.5 ft	Measuring Point:	TOC	Tubing Type:	LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (mL/min) or (gal/min)	Purge Rate (mL/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temp-erature (°F) or (°C)	pH	Conduct-ivity (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP/eH (mV)	Comments
Stabilized within →		[100 mL/min] to [500 mL/min]		--	N/A	[+/- 0.1]	[+/- 3%]	[+/- 10%]	[+/- 10%]	[+/- 10]	
1109	8.54	150	150		17.99	5.53	0.108	2.25	–	215	Sample for:
1114	8.58	150	150		17.92	5.15	0.099	1.15	–	221	VOCs* (Eurofins)
1119	8.58	150	150		17.18	5.19	0.093	1.04	–	198	- turbidity meter not functioning
1124	8.58	155	150		17.03	5.25	0.089	0.95	–	190	properly
1129	8.58	150	150		16.98	5.27	0.082	0.87	–	171	- clear water
1134	8.58	150	150		16.93	5.28	0.080	0.84	–	162	
1139	8.58	150	150		16.94	5.29	0.078	0.82	–	150	
1144	8.58	150	150		16.88	5.26	0.077	0.81	–	148	
1149	8.58	150	150	↓	16.93	5.24	0.077	0.80	–	147	
start sample				7.0							
											*Site Specific VOCs:
											1,1-Dichloroethane
											cis-1,2-Dichloroethene
											trans-1,2-Dichloroethene
											Methylene Chloride
											1,1,2-Trichloroethane
											Trichloroethene
											Vinyl Chloride

well volume = 3.14 (PI) x radius^2 x height of water column. 2 in well = 0.163 gal/ft, 3 in = 0.367 gal/ft 4 in = 0.653 gal/ft, 6 in = 1.469 gal/ft, 1 cu. ft. = 7.48 gal. 1 gal = 3.785 L, 1L = 0.264 gal. 0.5L/min = 0.132 gal/min

LOW FLOW SAMPLING FORM

PROJECT	Former General Time Facility	**H&A FILE NO.**	128752-003
LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Technology Corporation	**FIELD REP**	S. Lewis
CONTRACTOR	None	**DATE**	3/8/17

Sampling Data:

Well ID:	MW-111	Well Depth:	32 ft	Initial Depth To Water:	8.35 ft	Purging Device:	Peristaltic
Start time:	1002	Depth To Top Of Screen:	22 ft	Depth Of Pump Intake:	~27 ft	Tubing Present In Well:	☐ Yes ☒ No
Finish Time:	1040	Depth To Bottom Of Screen:	32 ft	Measuring Point:	TOC	Tubing Type:	LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (mL/min) or (gal/min)	Purge Rate (mL/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temp-erature (°F) or (°C)	pH	Conduct-ivity (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP/eH (mV)	Comments
Stabilized within →		[100 mL/min] to [500 mL/min]		--	N/A	[+/- 0.1]	[+/- 3%]	[+/- 10%]	[+/- 10%]	[+/- 10]	
1005	8.40	150	150		16.73	5.39	0.125	3.71	—	263	Sample for:
1010	8.40	150	150		16.54	5.64	0.120	3.21	—	248	VOCs* (Eurofins)
1015	8.41	150	150		16.50	5.84	0.112	2.74	—	231	- faulty turbidity meter,
1020	8.41	150	150		16.58	6.02	0.110	2.55	—	219	was working yesterday
1025	8.42	150	150		16.59	6.08	0.110	2.47	—	212	- water is clear
1030	8.42	150	150		16.65	6.11	0.110	2.39	—	207	- rotten egg odor
1035	8.42	150	150	↓	16.61	6.13	0.110	2.35	—	204	
				5.25							
											*Site Specific VOCs:
											1,1-Dichloroethane
											cis-1,2-Dichloroethene
											trans-1,2-Dichloroethene
											Methylene Chloride
											1,1,2-Trichloroethane
											Trichloroethene
											Vinyl Chloride

well volume = 3.14 (PI) x radius^2 x height of water column. 2 in well = 0.163 gal/ft, 3 in = 0.367 gal/ft 4 in = 0.653 gal/ft, 6 in = 1.469 gal/ft, 1 cu. ft. = 7.48 gal, 1 gal = 3.785 L, 1L = 0.264 gal, 0.5L/min = 0.132 gal/min

LOW FLOW SAMPLING FORM

PROJECT	Former General Time Facility	**H&A FILE NO.**	128752-003
LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Technology Corporation	**FIELD REP**	J. Vonts
CONTRACTOR	None	**DATE**	3/8/17

Sampling Data:

Well ID:	MW-11D	Well Depth:	289.6	ft	Initial Depth To Water:	9.14	ft	Purging Device:	Grundfos
Start time:	938	Depth To Top Of Screen:	-	ft	Depth Of Pump Intake:	~280	ft	Tubing Present In Well:	☐ Yes ☒ No
Finish Time:	1047	Depth To Bottom Of Screen:	289.6	ft	Measuring Point:	TOC		Tubing Type:	LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (mL/min) or (gal/min)	Purge Rate (mL/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temp-erature (°F) or (°C)	pH	Conduct-ivity (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP/eH (mV)	Comments
Stabilized within →		[100 mL/min] to [500 mL/min]		--	N/A	[+/- 0.1]	[+/- 3%]	[+/- 10%]	[+/- 10%]	[+/- 10]	
940	9.44			0	14.38	5.81	0.411	6.00	6.81	96	Sample for:
945	9.28		200	1.0	14.71	7.08	0.346	2.30	0.00	-52	VOCs* (Eurofins)
950	9.28		200	2.0	14.84	7.05	0.533	1.55	0.00	-131	
955	9.29		200	3.0	14.79	7.09	0.690	1.41	0.00	-204	Strong sulfur-like (rotten egg) odor
1000	9.29		200	4.0	14.89	6.99	0.707	1.26	0.00	-235	
1005	9.28		300	5.5	14.83	7.01	0.750	1.01	11.6	-276	
1010	9.28		200	6.5	14.87	6.84	0.775	0.82	16.5	-282	
1020	9.30		200	8.5	14.85	7.13	0.835	0.57	13.5	-320	
1025	9.30		200	9.5	14.95	6.84	0.832	0.51	7.54	-312	
1030	9.30		200	10.5	14.94	6.86	0.841	0.51	7.02	-317	
1035	9.31		200	11.5	14.97	6.87	0.853	0.49	4.26	-337	*Site Specific VOCs:
1040	9.31		200	12.5	14.97	6.87	0.858	0.47	2.93	-335	1,1-Dichloroethane
1045	9.31		200	13.5	14.93	6.89	0.859	0.47	3.30	-339	cis-1,2-Dichloroethene
											trans-1,2-Dichloroethene
	Parameters stable, sample time @ 1045										Methylene Chloride
											1,1,2-Trichloroethane
											Trichloroethene
											Vinyl Chloride

well volume = 3.14 (PI) x radius^2 x height of water column. 2 in well = 0.163 gal/ft, 3 in = 0.367 gal/ft 4 in = 0.653 gal/ft, 6 in = 1.469 gal/ft, 1 cu. ft. = 7.48 gal, 1 gal = 3.785 L, 1L = 0.264 gal, 0.5L/min = 0.132 gal/min

LOW FLOW SAMPLING FORM

PROJECT	Former General Time Facility	**H&A FILE NO.**	128752-003
LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Technology Corporation	**FIELD REP**	J. Vonts
CONTRACTOR	None	**DATE**	3/9/17

Sampling Data:

Well ID:	MW-16I	Well Depth:	30.68 ft	Initial Depth To Water:	20.61 ft	Purging Device:	Peristaltic
Start time:	837	Depth To Top Of Screen:	20.68 ft	Depth Of Pump Intake:	~26 ft	Tubing Present In Well:	☒ Yes ☐ No
Finish Time:	945	Depth To Bottom Of Screen:	30.68 ft	Measuring Point:	Top of Casing	Tubing Type:	LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (mL/min) or (gal/min)	Purge Rate (mL/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temp-erature (°F) or (°C)	pH	Conduct-ivity (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP/eH (mV)	Comments
Stabilized within →		[100 mL/min] to [500 mL/min]		--	N/A	[+/- 0.1]	[+/- 3%]	[+/- 10%]	[+/- 10%]	[+/- 10]	
845	20.82		100	0	11.51	6.30	2.64	2.11	45.5	-78	Sample for:
905	20.84		200	1.0	13.78	6.48	2.40	1.24	84.4	-108	VOCs* (Eurofins) 3
910	21.27		200	2.0	15.93	6.46	2.34	0.78	48.9	-121	Sulfate (Eurofins) 2
915	21.44		200	3.0	16.26	6.46	2.29	0.69	29.1	-122	Iron, Ferrous (Eurofins) 1
920	21.50		200	4.0	16.97	6.44	2.14	0.53	22.3	-125	Iron, Total (Eurofins) 1
925	21.58		200	5.0	17.18	6.45	2.10	0.47	16.6	-129	Total Organic Carbon (TOC) (Eurofins) 2
930	21.61		200	6.0	17.28	6.46	2.08	0.46	11.9	-131	Volatile Fatty Acids (VFA) (Pace Analytical) 2
935	21.63		200	7.0	17.31	6.46	2.06	0.45	1.68	-134	Methane/Ethane/Ethene (Eurofins) 2
	Parameters stable, sample time @ 935										
											*Site Specific VOCs:
											1,1-Dichloroethane
											cis-1,2-Dichloroethene
											trans-1,2-Dichloroethene
											Methylene Chloride
											1,1,2-Trichloroethane
											Trichloroethene
											Vinyl Chloride

well volume = 3.14 (PI) x radius^2 x height of water column. 2 in well = 0.163 gal/ft, 3 in = 0.367 gal/ft 4 in = 0.653 gal/ft, 6 in = 1.469 gal/ft, 1 cu. ft. = 7.48 gal, 1 gal = 3.785 L, 1L = 0.264 gal, 0.5L/min = 0.132 gal/min

LOW FLOW SAMPLING FORM

PROJECT	Former General Time Facility	**H&A FILE NO.**	128752-003
LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Technology Corporation	**FIELD REP**	S. Lewis
CONTRACTOR	None	**DATE**	3/9/17

Sampling Data:

Well ID:	MW-16D	Well Depth:	56.48 ft	Initial Depth To Water:	20.55 ft	Purging Device:	Peristaltic
Start time:	0838	Depth To Top Of Screen:	46.48 ft	Depth Of Pump Intake:	51.00 ft	Tubing Present In Well:	☒ Yes ☐ No
Finish Time:	0940	Depth To Bottom Of Screen:	56.48 ft	Measuring Point:	Top of Casing	Tubing Type:	LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (mL/min) or (gal/min)	Purge Rate (mL/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temp-erature (°F) or (°C)	pH	Conduct-ivity (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP/eH (mV)	Comments
Stabilized within →		[100 mL/min] to [500 mL/min]		–	N/A	[+/- 0.1]	[+/- 3%]	[+/- 10%]	[+/- 10%]	[+/- 10]	
0844	20.64	150	150		13.75	5.12	0.137	4.49	–	195	Sample for:
0849	20.67	150	150		15.32	5.59	0.120	3.31	–	217	VOCs* (Eurofins)
0854	20.67	150	150		16.08	5.89	0.117	3.01	–	217	Sulfate (Eurofins)
0859	20.67	150	150		16.63	5.90	0.116	2.76	–	222	Iron, Ferrous (Eurofins)
0904	20.67	150	150		16.76	5.98	0.116	2.70	–	225	Iron, Total (Eurofins)
0909	20.68	150	150		17.02	5.98	0.115	2.63	–	229	Total Organic Carbon (TOC) (Eurofins)
0914	20.68	150	150	↓	17.07	5.99	0.115	2.59	–	229	- clear water
First Sample				5.75							
											*Site Specific VOCs:
											1,1-Dichloroethane
											cis-1,2-Dichloroethene
											trans-1,2-Dichloroethene
											Methylene Chloride
											1,1,2-Trichloroethane
											Trichloroethene
											Vinyl Chloride

well volume = 3.14 (PI) x radius^2 x height of water column. 2 in well = 0.163 gal/ft, 3 in = 0.367 gal/ft 4 in = 0.653 gal/ft, 6 in = 1.469 gal/ft, 1 cu. ft. = 7.48 gal, 1 gal = 3.785 L, 1L = 0.264 gal, 0.5L/min = 0.132 gal/min

LOW FLOW SAMPLING FORM

PROJECT	Former General Time Facility	**H&A FILE NO.**	128752-003
LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Technology Corporation	**FIELD REP**	S. Lewis
CONTRACTOR	None	**DATE**	3/9/17

Sampling Data:

unable to gauge WL too big

Well ID:	MP-3	Well Depth:	~30.0 ft	Initial Depth To Water:	ft	Purging Device:	Peristaltic
Start time:	0951	Depth To Top Of Screen:	~20.0 ft	Depth Of Pump Intake:	ft	Tubing Present In Well:	☒ Yes ☐ No
Finish Time:	1045	Depth To Bottom Of Screen:	~30.0 ft	Measuring Point:	Top of Casing	Tubing Type:	LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (mL/min) or (gal/min)	Purge Rate (mL/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temp-erature (°F) or (°C)	pH	Conduct-ivity (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP/eH (mV)	Comments
Stabilized within →		[100 mL/min] to [500 mL/min]		--	N/A	[+/- 0.1]	[+/- 3%]	[+/- 10%]	[+/- 10%]	[+/- 10]	
0956	—	100	100		15.99	6.23	6.13	1.18	—	-151	Sample for:
1001	—	100	100		17.44	6.97	6.26	0.98	—	-163	VOCs* (Eurofins)
1006	—	100	100		17.62	7.00	6.22	0.94	—	-165	Sulfate (Eurofins)
1011	—	100	100		17.76	7.03	6.17	0.86	—	-166	Iron, Ferrous (Eurofins)
1016	—	101	100		17.72	7.04	6.18	0.84	—	-167	Iron, Total (Eurofins)
1021	—	100	100	↓	17.81	7.05	6.18	0.83	—	-167	Total Organic Carbon (TOC) (Eurofins)
start	sample			3.0							Volatile Fatty Acids (VFA) (Pace Analytical)
											Methane/Ethane/Ethene (Eurofins)
											- Strong odor
											- blue sheen on water
											*Site Specific VOCs: - Slightly turbid water
											1,1-Dichloroethane with light brown
											cis-1,2-Dichloroethene color
											trans-1,2-Dichloroethene
											Methylene Chloride
											1,1,2-Trichloroethane
											Trichloroethene
											Vinyl Chloride

well volume = 3.14 (PI) x radius^2 x height of water column. 2 in well = 0.163 gal/ft, 3 in = 0.367 gal/ft 4 in = 0.653 gal/ft, 6 in = 1.469 gal/ft, 1 cu. ft. = 7.48 gal, 1 gal = 3.785 L, 1L = 0.264 gal, 0.5L/min = 0.132 gal/min

LOW FLOW SAMPLING FORM

PROJECT	Former General Time Facility	**H&A FILE NO.**	128752-003
LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Technology Corporation	**FIELD REP**	J. Vonts
CONTRACTOR	None	**DATE**	3/9/17

Sampling Data:

Well ID:	MP-7	Well Depth:	~30.0 ft	Initial Depth To Water:	– ft	Purging Device:	Peristaltic
Start time:	1008	Depth To Top Of Screen:	~20.0 ft	Depth Of Pump Intake:	~25 ft	Tubing Present In Well:	☒ Yes ☐ No
Finish Time:	1055	Depth To Bottom Of Screen:	~30.0 ft	Measuring Point:	Top of Casing	Tubing Type:	LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (mL/min) or (gal/min)	Purge Rate (mL/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temp-erature (°F) or (°C)	pH	Conduct-ivity (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP/eH (mV)	Comments
Stabilized within →		[100 mL/min] to [500 mL/min]		--	N/A	[+/- 0.1]	[+/- 3%]	[+/- 10%]	[+/- 10%]	[+/- 10]	
1012	–			0	17.28	6.93	2.91	0.87	51.4	-147	Sample for:
1017	–		200	1.0	17.53	6.93	2.70	0.67	19.4	-152	VOCs* (Eurofins) 3
1022	–		200	2.0	17.61	6.95	2.59	0.61	0.0	-154	Sulfate (Eurofins) 1
1027	–		200	3.0	17.79	6.89	2.24	0.42	0.0	-151	Iron, Ferrous (Eurofins) 1
1032	–		200	4.0	17.89	6.91	2.05	0.35	0.0	-155	Iron, Total (Eurofins) 1
1037	–		200	5.0	17.92	6.90	2.02	0.36	0.0	-155	Total Organic Carbon (TOC) (Eurofins) 2
1042	–		200	6.0	17.93	6.90	2.00	0.36	0.0	-156	Volatile Fatty Acids (VFA) (Pace Analytical) 2
											Methane/Ethane/Ethene (Eurofins) 2
	Parameters stable, sample time @ 1042										
											*Site Specific VOCs:
											1,1-Dichloroethane
											cis-1,2-Dichloroethene
											trans-1,2-Dichloroethene
											Methylene Chloride
											1,1,2-Trichloroethane
											Trichloroethene
											Vinyl Chloride

well volume = 3.14 (PI) x radius^2 x height of water column. 2 in well = 0.163 gal/ft, 3 in = 0.367 gal/ft 4 in = 0.653 gal/ft, 6 in = 1.469 gal/ft, 1 cu. ft. = 7.48 gal, 1 gal = 3.785 L, 1L = 0.264 gal, 0.5L/min = 0.132 gal/min

LOW FLOW SAMPLING FORM

PROJECT	Former General Time Facility	**H&A FILE NO.**	128752-003
LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Technology Corporation	**FIELD REP**	S. Lewis
CONTRACTOR	None	**DATE**	3/9/17

Sampling Data: unable to gauge WL too big

Well ID:	MP-8	Well Depth:	~30.0 ft	Initial Depth To Water:	ft	Purging Device:	Peristaltic
Start time:	1056	Depth To Top Of Screen:	~20.0 ft	Depth Of Pump Intake:	25.00 ft	Tubing Present In Well:	☑ Yes ☐ No
Finish Time:	~~1354~~	Depth To Bottom Of Screen:	~30.0 ft	Measuring Point:	Top of Casing	Tubing Type:	LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (mL/min) or (gal/min)	Purge Rate (mL/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temp-erature (°F) or (°C)	pH	Conduct-ivity (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP/eH (mV)	Comments
Stabilized within →		[100 mL/min] to [500 mL/min]		--	N/A	[+/- 0.1]	[+/- 3%]	[+/- 10%]	[+/- 10%]	[+/- 10]	
1059	–	150	150		16.46	6.72	1.29	1.31	0.0	-84	Sample for:
1104	–	150	150		16.95	6.48	1.27	0.74	0.0	-135	VOCs* (Eurofins)
1109	–	150	150		17.07	6.56	1.28	0.51	0.0	-153	Sulfate (Eurofins)
1114	–	150	150		17.18	6.59	1.30	0.43	0.0	-162	Iron, Ferrous (Eurofins)
1119	–	150	150		17.23	6.58	1.32	0.40	0.0	-163	Iron, Total (Eurofins)
1124	–	150	150		17.25	6.60	1.34	0.38	0.0	-165	Total Organic Carbon (TOC) (Eurofins)
1129	–	150	150	↓	17.26	6.60	1.34	0.38	0.0	-165	Volatile Fatty Acids (VFA) (Pace Analytical)
Start Sample				(6 L)							Methane/Ethane/Ethene (Eurofins)
											- Strong odor
											*Site Specific VOCs:
											1,1-Dichloroethane
											cis-1,2-Dichloroethene
											trans-1,2-Dichloroethene
											Methylene Chloride
											1,1,2-Trichloroethane
											Trichloroethene
											Vinyl Chloride

well volume = 3.14 (PI) x radius^2 x height of water column. 2 in well = 0.163 gal/ft, 3 in = 0.367 gal/ft 4 in = 0.653 gal/ft, 6 in = 1.469 gal/ft, 1 cu. ft. = 7.48 gal, 1 gal = 3.785 L, 1L = 0.264 gal, 0.5L/min = 0.132 gal/min

LOW FLOW SAMPLING FORM

PROJECT	Former General Time Facility	**H&A FILE NO.**	128752-003
LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Technology Corporation	**FIELD REP**	J. Yontz
CONTRACTOR	None	**DATE**	3/9/17

Sampling Data:

Well ID:	RW-3	Well Depth:	89.6 ft	Initial Depth To Water:	14.73 ft	Purging Device:	Grundfos
Start time:	1450	Depth To Top Of Screen:	59.6 ft	Depth Of Pump Intake:	~75 ft	Tubing Present In Well:	☐ Yes ☒ No
Finish Time:	1545	Depth To Bottom Of Screen:	89.6 ft	Measuring Point:	TOC	Tubing Type:	LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (mL/min) or (gal/min)	Purge Rate (mL/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temp-erature (°F) or (°C)	pH	Conduct-ivity (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP/eH (mV)	Comments
Stabilized within →		[100 mL/min] to [500 mL/min]		--	N/A	[+/- 0.1]	[+/- 3%]	[+/- 10%]	[+/- 10%]	[+/- 10]	
1453	15.40			0	21.29	7.13	0.174	2.50	0.00	52	Sample for:
1458	15.98		250		21.88	7.17	0.244	0.66	925	21	VOCs* (Eurofins)
1503	16.18		250	2.5	22.47	7.19	0.240	0.59	996	11	
1508	16.26		250		22.80	7.03	0.215	0.68	424	15	
1513	16.31		250	5.0	22.87	6.96	0.204	0.70	302	21	
1518	16.60		250		21.54	6.78	0.185	0.76	118	39	
1523	16.71		250	7.5	21.70	6.73	0.180	0.75	67.8	47	
1528	16.75		250		21.87	6.69	0.175	0.75	52.3	68	
1533	17.05		250	10.0	21.47	6.67	0.174	0.76	24.9	64	
1538	17.13		250		21.54	6.67	0.173	0.77	18.4	66	
											*Site Specific VOCs:
	Parameters stable, sample time @1538										1,1-Dichloroethane
											cis-1,2-Dichloroethene
											trans-1,2-Dichloroethene
											Methylene Chloride
											1,1,2-Trichloroethane
											Trichloroethene
											Vinyl Chloride

well volume = 3.14 (PI) x radius^2 x height of water column. 2 in well = 0.163 gal/ft, 3 in = 0.367 gal/ft 4 in = 0.653 gal/ft, 6 in = 1.469 gal/ft, 1 cu. ft. = 7.48 gal. 1 gal = 3.785 L, 1L = 0.264 gal. 0.5L/min = 0.132 gal/min

LOW FLOW SAMPLING FORM

PROJECT	Former General Time Facility	**H&A FILE NO.**	128752-003
LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Technology Corporation	**FIELD REP**	J. Yonts
CONTRACTOR	None	**DATE**	3/9/17

Sampling Data:

Well ID:	RW-4	Well Depth:	89.61 ft	Initial Depth To Water:	13.55 ft	Purging Device:	Grundfos
Start time:	1600	Depth To Top Of Screen:	59.61 ft	Depth Of Pump Intake:	~15 ft	Tubing Present In Well:	☐ Yes ☑ No
Finish Time:	1650	Depth To Bottom Of Screen:	89.61 ft	Measuring Point:	TOC	Tubing Type:	LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (mL/min) or (gal/min)	Purge Rate (mL/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temp-erature (°F) or (°C)	pH	Conduct-ivity (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP/eH (mV)	Comments
Stabilized within →		[100 mL/min] to [500 mL/min]		--	N/A	[+/- 0.1]	[+/- 3%]	[+/- 10%]	[+/- 10%]	[+/- 10]	
1602	14.04			0	25.81	7.26	0.106	5.57	0.04	42	Sample for:
1612	17.23		400		19.47	7.05	0.114	5.55	180	79	VOCs* (Eurofins)
1617	17.16		400	4.0	19.08	6.67	0.108	5.00	260	107	
1622	17.16		300		19.08	6.51	0.103	5.10	88.6	113	
1627	17.15		300	7.0	19.03	6.30	0.097	5.22	42.1	126	
1632	17.15		300		19.02	6.16	0.094	5.23	23.0	133	
1637	17.15		300	10.0	18.99	6.00	0.088	5.27	17.9	148	
1642	17.15		300		18.97	5.95	0.087	5.26	1.28	151	
1647	17.15		300	13.0	18.99	5.97	0.087	5.25	1.18	150	
		Parameters stable, sample time @ 1647									*Site Specific VOCs:
											1,1-Dichloroethane
											cis-1,2-Dichloroethene
											trans-1,2-Dichloroethene
											Methylene Chloride
											1,1,2-Trichloroethane
											Trichloroethene
											Vinyl Chloride

well volume = 3.14 (PI) x radius^2 x height of water column. 2 in well = 0.163 gal/ft, 3 in = 0.367 gal/ft 4 in = 0.653 gal/ft, 6 in = 1.469 gal/ft, 1 cu. ft. = 7.48 gal, 1 gal = 3.785 L, 1L = 0.264 gal, 0.5L/min = 0.132 gal/min

HALEY ALDRICH

SURFACE WATER SAMPLE LOG

PROJECT	Former General Time Facility	**H&A FILE NO.**	128752-003
LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Techology Corporation	**FIELD REP**	J. Botts, S. Lewis
SUBCONTRACTOR	None	**DATE**	

Sample ID: SW-1
Date: 3/8/17
Time: 1340
Weather: Sunny 70s °F

DESCRIPTION OF SAMPLE LOCATION:

Name of Water Body: North Oconee River
Depth of Water: 3.0 ft
Velocity: 0.5 ft/sec
Other Comments: Sample taken approximately 50 ft downstream of small tributary
Substrate Description: Sands and gravels
Location: Near MW-11 well cluster
Description of Nearby Vegetation: Trees and shrubs

FIELD PARAMETERS:

Sample Method: Grab sample using disposable poly. cup
Sample Description:

Temperature (°C) °F	16.42	pH	5.74
Dissolved Oxygen (mg/L)	12.77	Conductivity (mS/cm)	0.092
Turbidity (NTU)	28.2	ORP (mV)	174

CONTAINER DESCRIPTION:

Laboratory: Eurofins - Lancaster

Bottle Type	Analysis	Preservative
40 mL VOA	VOCs*	HCl

Notes:

*Site specific COC

HALEY ALDRICH

SURFACE WATER SAMPLE LOG

PROJECT	Former General Time Facility	**H&A FILE NO.**	128752-003
LOCATION	Athens, Georgia	**PROJECT MGR.**	N. Alla
CLIENT	Carpenter Techology Corporation	**FIELD REP**	J. Yonts, S. Lewis
SUBCONTRACTOR	None	**DATE**	3/10/17

Sample ID: SW-2
Date: 3/10/17
Time: 755
Weather: Cloudy 50s°F

DESCRIPTION OF SAMPLE LOCATION:

Name of Water Body: North Oconee River
Depth of Water: 3.0 ft
Velocity: 0.5 ft/sec
Other Comments:
Substrate Description: sands and gravels
Location: Bride near MW-15I
Description of Nearby Vegetation: Trees and shrubs

FIELD PARAMETERS:

Sample Method: Grab sample using disposable poly. cup
Sample Description:

Temperature (°C/°F): 13.00
pH: 6.31
Dissolved Oxygen (mg/L): 9.00
Conductivity (mS/cm): 0.090
Turbidity (NTU): 282
ORP (mV): 146

CONTAINER DESCRIPTION:

Laboratory: Eurofins - Lancaster

Bottle Type	Analysis	Preservative
40 mL VOA	VOCs*	HCl

Notes:

*Site specific COC

APPENDIX C

Historical Summary of VOC Concentrations

APPENDIX D
HISTORICAL SUMMARY OF VOC CONCENTRATIONS
CARPENTER - GENERAL TIME FACILITY
ATHENS, GEORGIA

Location Name				MW-1I							MW-1S										
Sample Date	Mar-00	Dec-07	Mar-10	11/18/2010	12/21/2011	9/16/2015	9/9/2016	Mar-00	Dec-07	Mar-10	11/18/2010	12/21/2011	9/16/2015	9/9/2016	Mar-00	Dec-07	Mar-10	5/27/2009	8/19/2009	11/9/2009	3/24/2010
Field Parameters																					
Conductivity, Field (mS/cm)	-	-	-	**0.051**	**0.053**	**0.065**	**0.069**	-	-	-	**0.039**	**0.036**	**0.042**	-	-	-	-	**0.185**	**-**	**0.181**	**0.163**
Dissolved Oxygen, Field (mg/L)	-	-	-	**8.38**	**8.64**	**6.58**	**3.79**	-	-	-	**3.02**	**8.32**	**0.86**	-	-	-	-	1.11	-	**1.09**	**4.28**
ORP, Field (mV)	-	-	-	**167.3**	**142.9**	**204**	**183**	-	-	-	**104**	**149**	**84**	-	-	-	-	101.5	**-**	**77.4**	**-156.2**
pH, Field (NTU)	-	-	-	**6.29**	**6.25**	**6.58**	**5.84**	-	-	-	**5.67**	**5.97**	**5.17**	-	-	-	-	8.59	**-**	**8.43**	**9.2**
Temperature, Field (Deg C)	-	-	-	**18.71**	**18**	**19.44**	**28.76**	-	-	-	**19.23**	**17.4**	**21.31**	-	-	-	-	20.37	**-**	**17.64**	**18.83**
Turbidity, Field (NTU)	-	-	-	**1.5**	**1.4**	**2.0**	**1.5**	-	-	-	**8.5**	**5.1**	**14.6**	-	-	-	-	-	**-**	**2.43**	**7.85**
General Chemistry (mg/L)																					
Alkalinity, Total (as CaCO3)	-	-	-	**24.7**	**23.8**	-	-	-	-	-	12.3	**16.2**	-	-	-	-	-	74.9	**58.9**	**37.3**	**71**
Carbon Dioxide	-	-	**-**	**57.7**	**-**	**-**	**-**	**-**	**-**	**-**	**68.5**	**-**	**-**	**-**	**-**	**-**	**-**	**66.3**	**52.4**	**185**	**52.5**
Chloride	**-**	**-**	**-**	-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3.5**	**3.8**	**3.4**	**3.3**
Nitrate	-	-	-	**0.62**	**0.66**	-	-	-	-	-	**0.24**	**0.56**	-	-	-	-	-	**0.1**	**0.12**	**0.47**	**0.12**
Nitrite (as N)	-	-	-	< 0.10	< 0.1	-	-	-	-	-	< 0.10	< 0.1	-	-	-	-	-	< 0.10	< 0.10	< 0.10	< 0.10
Nitrite/Nitrate Nitrogen	-	-	-	**0.62**	**0.66**	-	-	-	-	-	**0.24**	**0.56**	-	-	-	-	-	< 0.20	< 2	**0.47**	< 0.20
Sulfate	-	-	-	< 2	< 5	-	-	-	-	-	< 2	< 5	-	-	-	-	-	**13.3**	**12.7**	**14**	**14.6**
Sulfide	-	-	-	< 1	< 0.1	-	-	-	-	-	< 1	< 0.1	-	-	-	-	-	< 1.0	< 1	< 1	**1.2**
Total Organic Carbon (TOC)	-	-	-	< 1	< 1	-	-	-	-	-	< 1	< 1	-	-	-	-	-	-	-	-	**13.4**
Dissolved Gases(ug/L)																					
Ethane	-	-	-	< 1	< 10	-	-	-	-	-	< 1	< 10	-	-	-	-	-	< 1	< 1	< 1	< 1
Ethene	-	-	-	< 1	< 10	-	-	-	-	-	< 1	< 10	-	-	-	-	-	< 1	< 1	< 1	< 1
Methane	-	-	-	< 0.50	< 10	-	-	-	-	-	**256**	< 10	-	-	-	-	-	**0.51**	**0.4 J**	**0.18 J**	**0.19 J**
Volatile Fatty Acids(mg/L)																					
Acetic Acid	-	-	-	-	**0.16**	-	-	-	-	-	-	**0.13**	-	-	-	-	-	-	-	-	-
Butyric Acid	-	-	-	-	**0.11**	-	-	-	-	-	-	**0.086**	-	-	-	-	-	-	-	-	-
Lactic Acid	-	-	-	-	**0.11**	-	-	-	-	-	-	**0.14**	-	-	-	-	-	-	-	-	-
Propionic Acid	-	-	-	-	**0.070**	-	-	-	-	-	-	**0.058**	-	-	-	-	-	-	-	-	-
Pyruvic Acid	-	-	-	-	< 0.15	-	-	-	-	-	-	< 0.15	-	-	-	-	-	-	-	-	-
Dissolved Hydrogen (nM)																					
Hydrogen	-	-	-	-	**2.0**	-	-	-	-	-	-	**1.0**	-	-	-	-	-	-	-	-	-
Inorganic Compounds(ug/L)																					
Iron, Dissolved	-	**-**	**-**	**-**	**-**	-	**-**	-	**-**	**-**	**-**	**-**	-	**-**	-	**-**	**-**	**-**	**-**	**-**	**-**
Iron, Total	-	**-**	**-**	**-**	**-**	-	**-**	-	**-**	**-**	**-**	**-**	-	**-**	-	**-**	**-**	**-**	**-**	**-**	**-**
Iron, Ferrous	**-**	**-**	**-**	< 0.10	**-**	**-**	**-**	**-**	**-**	**-**	**0.92**	**-**	**-**	**-**	**-**	**-**	**-**	**0.15**	< 0.10	< 0.10	**0.12**
Manganese, Dissolved	-	**-**	**-**	**-**	**-**	-	**-**	-	**-**	**-**	**-**	**-**	-	**-**	-	**-**	**-**	**-**	**-**	**-**	**-**
Manganese, Total	-	**-**	**-**	**-**	**-**	-	**-**	-	**-**	**-**	**-**	**-**	-	**-**	-	**-**	**-**	**-**	**-**	**-**	**-**
Volatile Organic Compounds (ug/L)																					
Acetone	-	-	-	< 25	< 25	-	-	-	-	-	< 25	< 25	-	-	-	-	-	< 25	-	< 25	< 25
Benzene	-	-	-	< 1	< 1	-	-	-	-	-	< 1	< 1	-	-	-	-	-	< 1	-	< 1	< 1
Bromobenzene	-	-	-	-	< 1	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
Bromochloromethane	-	-	-	-	< 1	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
Bromodichloromethane	-	-	-	< 1	< 1	-	-	-	-	-	< 1	< 1	-	-	-	-	-	< 1	-	< 1	< 1
Bromoform	-	-	-	< 1	< 1	-	-	-	-	-	< 1	< 1	-	-	-	-	-	< 1	-	< 1	< 1
Bromomethane	-	-	-	-	< 2	-	-	-	-	-	-	< 2	-	-	-	-	-	-	-	-	-
2-Butanone (MEK)	-	-	-	-	< 5	-	-	-	-	-	-	< 5	-	-	-	-	-	-	-	-	-
Carbon disulfide	-	-	-	**0.89 J**	-	-	-	-	-	-	**0.40 J**	-	-	-	-	-	-	**0.63**	-	< 2	< 2
Carbon tetrachloride	-	-	-	< 1	< 1	-	-	-	-	-	< 1	< 1	-	-	-	-	-	< 1	-	< 1	< 1
Chlorobenzene	-	-	-	< 1	< 1	-	-	-	-	-	< 1	< 1	-	-	-	-	-	< 1	-	< 1	< 1
Chloroethane	-	-	-	< 2	< 1	-	-	-	-	-	< 2	< 1	-	-	-	-	-	< 2	-	< 2	< 2
Chloroform	-	-	-	< 1	< 1	-	-	-	-	-	< 1	< 1	-	-	-	-	-	< 1	-	< 1	< 1
Chloromethane	-	< 10	< 5	< 1	-	< 1	-	-	< 10	< 5	< 1	-	< 1	-	-	ND	ND	-	-	-	-
2-Chlorotoluene	-	-	-	-	-	< 1	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
4-Chlorotoluene	-	-	-	-	-	< 1	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane	-	-	-	-	-	< 5	-	-	-	-	-	-	< 5	-	-	-	-	-	-	-	-
Dibromochloromethane	-	-	-	< 1	< 1	-	-	-	-	-	-	< 1	< 1	-	-	-	-	< 1	-	< 1	< 1
1,2-Dibromoethane (EDB)	-	-	-	-	< 1	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Dibromomethane	-	-	-	-	< 1	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	-	-	-	-	< 1	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	-	-	-	-	< 1	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	-	-	-	-	< 1	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	-	-	-	-	< 1	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,1-Dichloroethane	< 5	< 5	< 1	< 1	< 1	< 1	< 1	< 5	< 5	< 1	< 1	< 1	< 1	-	ND	ND	-	< 1	-	< 1	< 1
1,2-Dichloroethane	-	-	-	< 1	< 1	-	-	-	-	-	< 1	< 1	-	-	-	-	-	< 1	-	< 1	< 1
1,1-Dichloroethene	< 5	< 5	< 1	< 1	< 1	< 1	< 1	< 5	< 5	< 1	< 1	< 1	< 1	-	ND	ND	-	< 1	-	< 1	< 1
cis-1,2-Dichloroethene	-	< 5	< 1	< 2	< 1	< 1	< 1	-	< 5	< 1	< 2	< 1	< 1	-	ND	ND	-	< 2	**2.9**	< 2	< 2
trans-1,2-Dichloroethene	-	< 5	< 1	< 1	< 1	< 1	< 1	-	< 5	< 1	< 1	< 1	< 1	-	ND	ND	-	< 1	-	< 1	< 1
1,2-Dichloropropane	-	-	-	< 1	< 1	-	-	-	-	-	< 1	< 1	-	-	-	-	-	< 1	-	< 1	< 1
1,3-Dichloropropane	-	-	-	-	< 1	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
2,2-Dichloropropane	-	-	-	-	< 1	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
1,1-Dichloropropene	-	-	-	-	< 1	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	-	-	-	< 1	< 1	-	-	-	-	-	< 1	< 1	-	-	-	-	-	< 1	-	< 1	< 1
trans-1,3-Dichloropropene	-	-	-	< 1	< 1	-	-	-	-	-	< 1	< 1	-	-	-	-	-	< 1	-	< 1	< 1
Diisopropyl ether	-	-	-	-	< 1	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
Ethylbenzene	-	-	-	< 1	< 1	-	-	-	-	-	< 1	< 1	-	-	-	-	-	< 1	-	< 1	< 1
Hexachloro-1,3-butadiene	-	-	-	-	< 1	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
2-Hexanone	-	-	-	< 10	< 5	-	-	-	-	-	< 10	< 5	-	-	-	-	-	< 10	-	< 10	< 10
p-Isopropyltoluene	-	-	-	-	< 1	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
Methyl bromide	-	-	-	< 2	-	-	-	-	-	-	< 2	-	-	-	-	-	-	< 2	-	< 2	< 2
Methyl chloride	< 5	< 5	< 1	< 2	-	-	-	< 5	< 5	< 1	< 2	-	-	-	ND	ND	-	< 2	-	< 2	< 2
Methylene Chloride	-	-	-	< 2	< 2	< 4	< 4	-	-	-	< 2	< 2	< 4	-	-	-	-	**3.9**	-	< 2	< 2
Methyl ethyl ketone	-	-	-	< 5	-	-	-	-	-	-	< 5	-	-	-	-	-	-	< 5	-	< 5	< 5
4-Methyl-2-pentanone (MIBK)	-	-	-	< 5	< 5	-	-	-	-	-	< 5	< 5	-	-	-	-	-	< 5	-	< 5	< 5
Methyl-tert-butyl ether	-	-	-	-	< 1	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
Naphthalene	-	-	-	-	< 1	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
Styrene	-	-	-	< 1	< 1	-	-	-	-	-	< 1	< 1	-	-	-	-	-	< 1	-	< 1	< 1
1,1,1,2-Tetrachloroethane	-	-	-	-	< 1	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	-	-	-	< 1	< 1	-	-	-	-	-	< 1	< 1	-	-	-	-	-	< 1	-	< 1	< 1
Tetrachloroethene	< 5	< 5	< 1	< 1	< 1	-	-	< 5	< 5	< 1	< 1	< 1	-	-	ND	ND	-	< 1	-	< 1	< 1
Toluene	-	-	-	< 1	< 1	-	-	-	-	-	< 1	< 1	-	-	-	-	-	**0.9**	-	< 1	< 1
1,2,3-Trichlorobenzene	-	-	-	-	< 1	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	-	-	-	-	< 1	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	< 5	< 5	< 1	< 1	< 1	-	-	< 5	< 5	< 1	< 1	< 1	-	-	ND	ND	-	< 1	-	< 1	< 1
1,1,2-Trichloroethane	< 5	< 5	< 1	< 1	< 1	< 1	< 1	< 5	< 5	< 1	< 1	< 1	< 1	-	ND	ND	-	< 1	-	< 1	< 1
Trichloroethene	< 5	< 5	< 5	< 1	< 1	< 1	< 1	< 5	< 5	< 5	< 1	< 1	< 1	-	< 5	**1.1**	**2.3**	**2.3**	**336**	**2.4**	**16.9**
Trichlorofluoromethane	-	-	-	-	< 1	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
1,2,3-Trichloropropane	-	-	-	-	< 1	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
Vinyl acetate	-	-	-	-	< 2	-	-	-	-	-	-	< 2	-	-	-	-	-	-	-	-	-
Vinyl chloride	< 2	< 2	< 1	< 1	< 1	< 1	< 1	< 2	< 2	< 1	< 1	< 1	< 1	-	ND	ND	< 1	< 1	< 1	< 1	< 1
m&p-Xylene	-	-	-	-	< 2	-	-	-	-	-	-	< 2	-	-	-	-	-	-	-	-	-
o-Xylene	-	-	-	-	< 1	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
Xylene, Total	-	-	-	< 3	-	-	-	-	-	-	< 3	-	-	-	-	-	-	< 3	-	< 3	< 3

Notes and Abbreviations:
1. Results shown in **bold** were detected.
2. < - Not detected above the laboratory detection limit.
3. Only detected compounds are shown in table.
4. - Not analyzed.
5. ND = Non Detect

APPENDIX D
HISTORICAL SUMMARY OF VOC CONCENTRATIONS
CARPENTER - GENERAL TIME FACILITY
ATHENS, GEORGIA

Location Name	MW-2D									MW-2I												
Sample Date	6/29/2010	9/30/2010	11/18/2010	8/3/2011	12/22/2011	12/22/2011	2/21/2012	9/17/2015	9/8/2016	Mar-00	Dec-07	Mar-07	5/27/2009	8/19/2009	11/9/2009	3/23/2010	6/28/2010	9/30/2010	11/18/2010	12/21/2011	2/20/2012	2/23/2015
Field Parameters																						
Conductivity, Field (mS/cm)	**-**	**-**	**0.181**	**0.225**	-	**0.205**	**0.167**	-	**0.229**	-	-	-	**0.078**	**-**	**0.064**	**0.068**	**-**	**-**	**0.064**	**0.064**	**0.068**	**-**
Dissolved Oxygen, Field (mg/L)	**-**	**-**	**1.09**	**0.55**	-	**1.08**	**1.1**	-	**0.56**	-	-	-	**2.28**	**-**	**2.32**	**3.23**	**-**	**-**	**2.32**	**2.54**	**1.5**	**-**
ORP, Field (mV)	**-**	**-**	**77.4**	**-206.3**	-	**-30.1**	**3.8**	-	**-53**	-	-	-	**31.1**	**-**	**173.7**	**-147.9**	**-**	**-**	**173.7**	**151.9**	**61.4**	**-**
pH, Field (NTU)	**-**	**-**	**8.43**	**9.89**	-	**7.89**	**8.6**	-	**9.85**	-	-	-	**5.91**	**-**	**6.04**	**5.82**	**-**	**-**	**6.04**	**5.89**	**5.87**	**-**
Temperature, Field (Deg C)	**-**	**-**	**17.64**	**23.9**	-	**18.8**	**13.6**	-	**21.6**	-	-	-	**21.44**	**-**	**19.09**	**17.79**	**-**	**-**	**19.09**	**18.9**	**17**	**-**
Turbidity, Field (NTU)	**-**	**-**	**2.43**	**4.1**	-	**3.4**	**2.4**	-	**7.91**	-	-	-	**-**	**-**	**2.6**	**28.2**	**-**	**-**	**2.6**	**5.1**	**3**	**-**
General Chemistry (mg/L)																						
Alkalinity, Total (as CaCO3)	**60**	**74**	**80**	-	**75.6**	**77.7**	**78.4**	-	-	-	-	-	**28.2**	**26.1**	**30.5**	**31**	**23**	**29.1**	**29.4**	**29.2**	**28.6**	**-**
Carbon Dioxide	**55**	**66.5**	**71.7**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**127**	**157**	**105**	**119**	**87**	**67.8**	**84.7**	**-**	**-**	**-**
Chloride	**3.1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3.8**	**4.4**	**3.8**	**4.2**	**3.6**	**-**	**-**	**-**	**-**	**-**
Nitrate	< 0.1	< 0.1	**0.11**	< 0.1	< 0.2	< 0.2	< 0.2	-	-	-	-	-	**1.5**	**1.6**	**1.4**	**1.4**	**1.4**	**1.4**	**1.4**	**1.5**	**0.44**	**1.5**
Nitrite (as N)	< 0.1	< 0.1	< 0.10	< 0.1	< 0.1	< 0.1	< 0.1	-	-	-	-	-	< 0.10	< 0.10	< 0.10	**0.14**	< 0.10	< 0.10	< 0.20	< 0.1	< 0.1	< 0.050
Nitrite/Nitrate Nitrogen	< 0.2	< 0.2	< 0.20	< 0.2	< 0.2	< 0.2	< 0.2	-	-	-	-	-	**1.5**	**1.6**	**1.4**	**1.5**	**1.4**	**1.4**	**1.4**	**1.5**	**0.44**	**-**
Sulfate	**17.6**	**13.8**	**22.3**	21.9	**23.8**	**24.9**	**22.1**	-	-	-	-	-	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 5	< 5.0
Sulfide	< 1	< 1	< 1	-	< 0.1	< 0.1	< 0.1	-	-	-	-	-	< 1	< 1	**1**	< 1	**1.1**	< 1	< 1	< 0.1	< 0.1	-
Total Organic Carbon (TOC)	< 1	< 1	< 1	**11.9**	**1.6**	**1.7**	**1.4**	-	-	-	-	-	-	-	-	-	< 1	**2.1**	< 1	**1.8**	**2.2**	< 1.0
Dissolved Gases(ug/L)																						
Ethane	< 1	< 1	< 1	< 10	< 10	< 10	< 12.4	-	-	-	-	-	< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 10	< 12.4	-
Ethene	**0.53 J**	< 0.50	< 1	< 10	< 10	< 10	< 12.4	-	-	-	-	-	< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 10	< 12.4	-
Methane	**1.66**	**0.18 J**	**0.60 J**	< 10	< 10	< 10	< 6.6	-	-	-	-	-	**0.58**	**1.95**	**0.55**	**1.75**	**0.57**	**1**	**0.57**	< 10	< 6.6	-
Volatile Fatty Acids(mg/L)																						
Acetic Acid	-	-	-	-	< 0.070	< 0.070	**0.021 J**	-	-	-	-	-	-	-	-	-	-	-	-	**0.36**	**0.0096 J**	**-**
Butyric Acid	-	-	-	-	< 0.050	< 0.050	< 0.050	-	-	-	-	-	-	-	-	-	-	-	-	**0.12**	< 0.050	-
Lactic Acid	-	-	-	-	**0.22**	**0.16**	**0.090 J**	-	-	-	-	-	-	-	-	-	-	-	-	**0.10**	**0.063 J**	**-**
Propionic Acid	-	-	-	-	< 0.050	< 0.050	< 0.050	-	-	-	-	-	-	-	-	-	-	-	-	**0.092**	< 0.050	-
Pyruvic Acid	-	-	-	-	< 0.15	< 0.15	< 0.15	-	-	-	-	-	-	-	-	-	-	-	-	< 0.15	< 0.15	-
Dissolved Hydrogen (nM)																						
Hydrogen	-	-	-	-	**3.7**	**4.9**	**1.8**	-	-	-	-	-	-	-	-	-	-	-	-	**1.2**	**1.3**	**-**
Inorganic Compounds(ug/L)																						
Iron, Dissolved	**-**	**-**	**-**	< 50	**-**	**-**	**-**	**-**	**-**	-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iron, Total	**-**	**-**	**-**	**57.4**	**-**	**-**	**-**	**-**	**-**	-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	< 0.200
Iron, Ferrous	**0.16**	< 0.10	**0.11**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	< 0.10	**0.22**	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	**-**	**-**	**-**
Manganese, Dissolved	**-**	**-**	**-**	< 5	**-**	**-**	**-**	**-**	**-**	-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Manganese, Total	**-**	**-**	**-**	**5.3**	-	-	-	**-**	**-**	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Volatile Organic Compounds (ug/L)																						
Acetone	< 25	< 25	< 25	-	< 25	< 25	-	-	-	**-**	**-**	**-**	< 2500	-	< 2500	< 1300	< 2500	< 5000	< 2500	< 25	-	< 100
Benzene	< 1	< 1	< 1	-	< 1	< 1	-	-	-	**-**	**-**	**-**	< 100	-	< 100	< 50	< 100	< 200	< 100	< 1	-	<5
Bromobenzene	-	-	-	-	< 1	< 1	-	-	-	**-**	**-**	**-**	-	-	-	-	-	-	-	< 1	-	-
Bromochloromethane	-	-	-	-	< 1	< 1	-	-	-	**-**	**-**	**-**	-	-	-	-	-	-	-	< 1	-	-
Bromodichloromethane	< 1	< 1	< 1	-	< 1	< 1	-	-	-	**-**	**-**	**-**	< 100	-	< 100	< 50	< 100	< 200	< 100	< 1	-	< 5
Bromoform	< 1	< 1	< 1	-	< 1	< 1	-	-	-	**-**	**-**	**-**	< 100	-	< 100	< 50	< 100	< 200	< 100	< 1	-	< 20
Bromomethane	-	-	-	-	< 2	< 2	-	-	-	**-**	**-**	**-**	-	-	-	-	-	-	-	< 2	-	< 5
2-Butanone (MEK)	-	-	-	-	< 5	< 5	-	-	-	**-**	**-**	**-**	-	-	-	-	-	-	-	< 5	-	< 50
Carbon disulfide	< 2	< 2	< 2	-	-	-	-	-	-	**-**	**-**	**-**	**33.1 J**	-	< 200	< 100	< 200	< 400	< 200	-	-	-
Carbon tetrachloride	< 1	< 1	< 1	-	< 1	< 1	-	-	-	**-**	**-**	**-**	< 100	-	< 100	< 50	< 100	< 200	< 100	< 1	-	< 5
Chlorobenzene	< 1	< 1	< 1	-	< 1	< 1	-	-	-	**-**	**-**	**-**	< 100	-	< 100	< 50	< 100	< 200	< 100	< 1	-	< 5
Chloroethane	< 2	< 2	< 2	-	< 1	< 1	-	-	-	-	-	-	< 200	-	< 200	< 100	< 200	< 400	< 200	< 1	-	< 5
Chloroform	< 1	< 1	< 1	-	< 1	< 1	-	-	-	-	-	-	< 100	-	< 100	< 50	< 100	< 200	< 100	< 1	-	< 5
Chloromethane	-	-	-	-	< 1	< 1	-	-	-	< 1000	< 500	< 20	-	-	-	-	-	-	-	< 1	-	< 5
2-Chlorotoluene	-	-	-	-	< 1	< 1	-	-	-	**-**	**-**	**-**	-	-	-	-	-	-	-	< 1	-	-
4-Chlorotoluene	-	-	-	-	< 1	< 1	-	-	-	**-**	**-**	**-**	-	-	-	-	-	-	-	< 1	-	-
1,2-Dibromo-3-chloropropane	-	-	-	-	< 5	< 5	-	-	-	**-**	**-**	**-**	-	-	-	-	-	-	-	< 5	-	< 25
Dibromochloromethane	< 1	< 1	< 1	-	< 1	< 1	-	-	-	**-**	**-**	**-**	< 100	-	< 100	< 50	< 100	< 200	< 100	< 1	-	< 5
1,2-Dibromoethane (EDB)	-	-	-	-	< 1	< 1	-	-	-	**-**	**-**	**-**	-	-	-	-	-	-	-	< 1	-	< 5
Dibromomethane	-	-	-	-	< 1	< 1	-	-	-	**-**	**-**	**-**	-	-	-	-	-	-	-	< 1	-	-
1,2-Dichlorobenzene	-	-	-	-	< 1	< 1	-	-	-	**-**	**-**	**-**	-	-	-	-	-	-	-	< 1	-	< 25
1,3-Dichlorobenzene	-	-	-	-	< 1	< 1	-	-	-	**-**	**-**	**-**	-	-	-	-	-	-	-	< 1	-	< 25
1,4-Dichlorobenzene	-	-	-	-	< 1	< 1	-	-	-	**-**	**-**	**-**	-	-	-	-	-	-	-	< 1	-	< 25
Dichlorodifluoromethane	-	-	-	-	< 1	< 1	-	-	-	**-**	**-**	**-**	-	-	-	-	-	-	-	< 1	-	< 5
1,1-Dichloroethane	< 1	< 1	< 1	-	< 1	< 1	-	-	< 1	< 1000	< 500	< 15	< 100	-	< 100	< 50	< 100	< 200	< 100	< 1	-	< 5
1,2-Dichloroethane	< 1	< 1	< 1	-	< 1	< 1	-	-	< 1	**-**	**-**	**-**	< 100	-	< 100	< 50	< 100	< 200	< 100	< 1	-	< 5
1,1-Dichloroethene	< 1	< 1	< 1	-	< 1	< 1	-	-	< 1	< 1000	< 500	< 26	< 100	-	< 100	< 50	< 100	< 200	< 100	**11.9**	-	**13**
cis-1,2-Dichloroethene	< 2	< 2	< 2	< 1	< 1	< 1	< 1	-	< 1	-	-	**155**	**403**	**369**	**374**	**487**	**488**	**403**	**659**	**924**	**813**	**1300**
trans-1,2-Dichloroethene	< 1	< 1	< 1	< 1	< 1	< 1	< 1	-	< 1	-	-	< 24	< 100	-	< 100	**21.1 J**	< 100	< 200	< 100	**24.1**	< 100	**26**
1,2-Dichloropropane	< 1	< 1	< 1	-	< 1	< 1	-	-	-	**-**	**-**	**-**	< 100	-	< 100	< 50	< 100	< 200	< 100	< 1	-	< 5
1,3-Dichloropropane	-	-	-	-	< 1	< 1	-	-	-	**-**	**-**	**-**	-	-	-	-	-	-	-	< 1	-	-
2,2-Dichloropropane	-	-	-	-	< 1	< 1	-	-	-	**-**	**-**	**-**	-	-	-	-	-	-	-	< 1	-	-
1,1-Dichloropropene	-	-	-	-	< 1	< 1	-	-	-	**-**	**-**	**-**	-	-	-	-	-	-	-	< 1	-	-
cis-1,3-Dichloropropene	< 1	< 1	< 1	-	< 1	< 1	-	-	-	**-**	**-**	**-**	< 100	-	< 100	< 50	< 100	< 200	< 100	< 1	-	< 5
trans-1,3-Dichloropropene	< 1	< 1	< 1	-	< 1	< 1	-	-	-	**-**	**-**	**-**	< 100	-	< 100	< 50	< 100	< 200	< 100	< 1	-	< 5
Diisopropyl ether	-	-	-	-	< 1	< 1	-	-	-	**-**	**-**	**-**	-	-	-	-	-	-	-	< 1	-	-
Ethylbenzene	< 1	< 1	< 1	-	< 1	< 1	-	-	-	**-**	**-**	**-**	< 100	-	< 100	< 50	< 100	< 200	< 100	< 1	-	< 5
Hexachloro-1,3-butadiene	-	-	-	-	< 1	< 1	-	-	-	**-**	**-**	**-**	-	-	-	-	-	-	-	< 1	-	-
2-Hexanone	< 10	< 10	< 10	-	< 5	< 5	-	-	-	**-**	**-**	**-**	< 1000	-	< 1000	< 500	< 1000	< 1000	< 1000	< 5	-	< 50
p-Isopropyltoluene	-	-	-	-	< 1	< 1	-	-	-	**-**	**-**	**-**	-	-	-	-	-	-	-	< 1	-	< 25
Methyl bromide	< 2	< 2	< 2	-	-	-	-	-	-	**-**	**-**	**-**	< 200	-	< 200	< 100	< 200	< 400	< 200	-	-	-
Methyl chloride	< 2	< 2	< 2	-	-	-	-	-	-	-	-	-	< 200	-	< 200	< 100	< 200	< 400	< 200	-	-	-
Methylene Chloride	< 2	< 2	< 2	-	< 2	< 2	-	-	< 4	< 1000	< 500	**24.1**	**608**	-	**103 J**	< 250	<200	**631**	<200	< 2	-	< 20
Methyl ethyl ketone	< 5	< 5	< 5	-	-	-	-	-	-	-	-	-	< 500	-	< 500	< 250	< 500	< 1000	< 500	-	-	-
4-Methyl-2-pentanone (MIBK)	< 5	< 5	< 5	-	< 5	< 5	-	-	-	**-**	**-**	**-**	< 500	-	< 500	< 250	< 500	< 1000	< 500	< 5	-	< 50
Methyl-tert-butyl ether	-	-	-	-	< 1	< 1	-	-	-	**-**	**-**	**-**	-	-	-	-	-	-	-	< 1	-	< 5
Naphthalene	-	-	-	-	< 1	< 1	-	-	-	**-**	**-**	**-**	-	-	-	-	-	-	-	< 1	-	-
Styrene	< 1	< 1	< 1	-	< 1	< 1	-	-	-	**-**	**-**	**-**	< 100	-	< 100	< 50	< 100	< 200	< 100	< 1	-	< 25
1,1,1,2-Tetrachloroethane	-	-	-	-	< 1	< 1	-	-	-	**-**	**-**	**-**	-	-	-	-	-	-	-	< 1	-	-
1,1,2,2-Tetrachloroethane	< 1	< 1	< 1	-	< 1	< 1	-	-	-	**-**	**-**	**-**	< 100	-	< 100	< 50	< 100	< 200	< 100	< 1	-	< 5
Tetrachloroethene	< 1	< 1	< 1	< 1	< 1	< 1	-	-	-	< 1000	< 500	< 23	< 100	-	< 100	< 50	< 100	< 200	< 100	**1.2**	-	< 5
Toluene	**0.40 J**	**0.26 J**	**0.35 J**	-	< 1	< 1	-	-	-	**-**	**-**	**-**	< 100	-	< 100	< 50	< 100	< 200	< 100	< 1	-	< 5
1,2,3-Trichlorobenzene	-	-	-	-	< 1	< 1	-	-	-	**-**	**-**	**-**	-	-	-	-	-	-	-	< 1	-	-
1,2,4-Trichlorobenzene	-	-	-	-	< 1	< 1	-	-	-	**-**	**-**	**-**	-	-	-	-	-	-	-	< 1	-	< 25
1,1,1-Trichloroethane	< 1	< 1	< 1	-	< 1	< 1	-	-	-	< 1000	< 500	< 12	< 100	-	< 100	< 50	< 100	< 200	< 100	< 1	-	< 5
1,1,2-Trichloroethane	< 1	< 1	< 1	-	< 1	< 1	-	-	< 1	< 1000	< 500	< 16	< 100	-	< 100	< 50	< 100	< 200	< 100	**2.7**	-	< 5
Trichloroethene	**1.4**	**2.2**	**1.4**	**1.1**	**1.1**	< 1	< 1	-	**4**	**18000**	**12000**	**5613**	**8700**	**7450**	**9340**	**8370**	**8080**	**9990**	**8540**	**11500**	**9430**	**14000**
Trichlorofluoromethane	-	-	-	-	< 1	< 1	-	-	-	**-**	**-**	**-**	-	-	-	-	-	-	-	< 1	-	< 5
1,2,3-Trichloropropane	-	-	-	-	< 1	< 1	-	-	-	**-**	**-**	**-**	-	-	-	-	-	-	-	< 1	-	-
Vinyl acetate	-	-	-	-	< 2	< 2	-	-	-	**-**	**-**	**-**	-	-	-	-	-	-	-	< 2	-	-
Vinyl chloride	**0.81 J**	< 1	**0.39 J**	< 1	< 1	< 1	< 1	-	< 1	< 400	< 200	<28	< 100	< 100	< 100	< 50	< 100	< 200	< 100	**1.3**	< 100	< 5
m&p-Xylene	-	-	-	-	< 2	< 2	-	-	-	**-**	**-**	**-**	-	-	-	-	-	-	-	< 2	-	-
o-Xylene	-	-	-	-	< 1	< 1	-	-	-	**-**	**-**	**-**	-	-	-	-	-	-	-	< 1	-	-
Xylene, Total	< 3	< 3	< 3	-	-	-	-	-	-	**-**	**-**	**-**	< 300	-	< 300	< 150	< 300	< 600	< 300	-	-	-

Notes and Abbreviations:
1. Results shown in **bold** were detected.
2. < - Not detected above the laboratory detection limit.
3. Only detected compounds are shown in table.
4. - Not analyzed.
5. ND = Non Detect

APPENDIX D
HISTORICAL SUMMARY OF VOC CONCENTRATIONS
CARPENTER - GENERAL TIME FACILITY
ATHENS, GEORGIA

Location Name	MW-2S															MW-3I					
Sample Date	9/16/2015	9/7/2016	Mar-00	Mar-07	5/27/2009	8/19/2009	11/9/2009	3/23/2010	6/28/2010	9/30/2011	11/18/2010	8/3/2011	12/21/2011	2/20/2012	9/16/2015	9/7/2016	Mar-00	Dec-07	12/27/2011	9/17/2015	9/8/2016	Mar-00
Field Parameters																						
Conductivity, Field (mS/cm)	**0.087**	**0.105**	-	-	**0.082**	-	**0.09**	**0.101**	-	-	**0.09**	**0.153**	**0.06**	**0.84**	**0.109**	**0.125**	-	-	**0.092**	**0.101**	**0.099**	-
Dissolved Oxygen, Field (mg/L)	**4.11**	**0.29**	-	-	**4.24**	-	**2.98**	**6.18**	-	-	**2.98**	**0.37**	**6.86**	**4**	**3.41**	**0.67**	-	-	**3.34**	**4.69**	**2.81**	-
ORP, Field (mV)	**83**	**109**	-	-	**69.5**	-	**208**	**-131**	-	-	**208**	**91.7**	**156**	**52.1**	**192**	**131**	-	-	**78.6**	**110**	**70**	-
pH, Field (NTU)	**6.62**	**6.07**	-	-	**5.11**	-	**5.65**	**5.78**	-	-	**5.65**	**5.93**	**5.58**	**5.7**	**6.39**	**5.63**	-	-	**6.27**	**7.61**	**6.00**	-
Temperature, Field (Deg C)	**22.42**	**34.73**	-	-	**18.85**	-	**21.12**	**18.18**	-	-	**21.72**	**21**	**19**	**16.2**	**22.38**	**35.85**	-	-	**18.5**	**21.59**	**24.4**	-
Turbidity, Field (NTU)	**1.0**	**8.2**	-	-	**-**	-	**1.1**	**9.84**	-	-	**1.1**	**5.9**	**2.2**	**4**	**0.2**	**38.3**	-	-	**4.8**	**0.2**	**29.5**	-
General Chemistry (mg/L)																						
Alkalinity, Total (as CaCO3)	-	-	-	-	**20.8**	**32**	**12.7**	**33.4**	**22**	**21.7**	**27.1**	-	**19.5**	**26.5**	-	-	-	-	-	-	-	-
Carbon Dioxide	**-**	**-**	**-**	**-**	**136**	**266**	**130**	**138**	**105**	**108**	**108**	**-**	-	-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Chloride	**-**	**-**	**-**	**-**	**3.3**	**10.5**	**12.3**	**3.6**	**2.9**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Nitrate	-	-	-	-	**0.62**	< 0.10	< 0.10	**0.43**	**0.45**	**0.61**	**0.54**	< 0.2	**0.43**	**1.6**	-	-	-	-	-	-	-	-
Nitrite (as N)	-	-	-	-	< 0.10	< 0.10	< 0.10	**0.14**	< 0.10	< 0.10	< 0.10	< 0.1	< 0.1	< 0.1	-	-	-	-	-	-	-	-
Nitrite/Nitrate Nitrogen	-	-	-	-	**0.62**	< 0.20	< 0.20	**0.57**	**0.45**	**0.61**	**0.54**	< 0.2	**0.43**	**1.6**	-	-	-	-	-	-	-	-
Sulfate	-	-	-	-	**10**	**10.3**	< 2	**17.1**	**11.6**	**8.6**	**13.5**	**12.5**	**7.9**	**12**	-	-	-	-	-	-	-	-
Sulfide	-	-	-	-	< 1	< 1	< 1	**1.2**	< 1	< 1	< 1	-	< 0.1	< 0.1	-	-	-	-	-	-	-	-
Total Organic Carbon (TOC)	-	-	-	-	-	-	-	-	< 1	< 1	< 1	**5**	**3.7**	**2.7**	-	-	-	-	-	-	-	-
Dissolved Gases(ug/L)																						
Ethane	-	-	-	-	< 1	**1.3**	**0.46**	< 1	< 1	< 1	< 1	< 10	< 10	< 12.4	-	-	-	-	-	-	-	-
Ethene	-	-	-	-	< 1	**0.83**	**1.2**	< 1	< 1	< 1	< 1	<10	< 10	< 12.4	-	-	-	-	-	-	-	-
Methane	-	-	-	-	< 0.5	**1390**	**1200**	**0.43**	< 0.50	**2.99**	< 0.5	**1410**	**11.2**	< 6.6	-	-	-	-	-	-	-	-
Volatile Fatty Acids(mg/L)																						
Acetic Acid	-	-	-	-	-	-	-	-	-	-	-	-	**0.38**	**0.014 J**	-	-	-	-	-	-	-	-
Butyric Acid	-	-	-	-	-	-	-	-	-	-	-	-	**0.17**	< 0.050	-	-	-	-	-	-	-	-
Lactic Acid	-	-	-	-	-	-	-	-	-	-	-	-	< 0.10	**0.060 J**	-	-	-	-	-	-	-	-
Propionic Acid	-	-	-	-	-	-	-	-	-	-	-	-	**0.11**	< 0.050	-	-	-	-	-	-	-	-
Pyruvic Acid	-	-	-	-	-	-	-	-	-	-	-	-	< 0.15	< 0.15	-	-	-	-	-	-	-	-
Dissolved Hydrogen (nM)																						
Hydrogen	-	-	-	-	-	-	-	-	-	-	-	-	**3.8**	**2.4**	-	-	-	-	-	-	-	-
Inorganic Compounds(ug/L)																						
Iron, Dissolved	**-**	**-**	-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	< 50	**-**	**-**	**-**	**-**	-	**-**	**-**	**-**	**-**	-
Iron, Total	**-**	**-**	-	**-**	**-**	**-**	**-**	-	**-**	**-**	-	< 50	**-**	**-**	**-**	**-**	-	**-**	**-**	**-**	**-**	-
Iron, Ferrous	**-**	**-**	**-**	**-**	< 0.10	**1.1**	**2**	< 0.10	< 0.10	< 0.10	< 0.10	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Manganese, Dissolved	**-**	**-**	-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**7**	**-**	**-**	**-**	**-**	-	**-**	**-**	**-**	**-**	-
Manganese, Total	**-**	**-**	-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**9.1**	**-**	**-**	**-**	**-**	-	**-**	**-**	**-**	**-**	-
Volatile Organic Compounds (ug/L)																						
Acetone	-	-	-	-	< 25	-	< 1300	< 25	< 25	< 25	< 25	-	< 25	-	-	-	-	-	< 25	-	-	-
Benzene	-	-	-	-	< 1	-	< 50	< 1	< 1	< 1	< 1	-	< 1	-	-	-	-	-	< 1	-	-	-
Bromobenzene	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	< 1	-	-	-
Bromochloromethane	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	< 1	-	-	-
Bromodichloromethane	-	-	-	-	< 1	-	< 50	< 1	< 1	< 1	< 1	-	< 1	-	-	-	-	-	< 1	-	-	-
Bromoform	-	-	-	-	< 1	-	< 50	< 1	< 1	< 1	< 1	-	< 1	-	-	-	-	-	< 1	-	-	-
Bromomethane	-	-	-	-	-	-	-	-	-	-	-	-	< 2	-	-	-	-	-	< 2	-	-	-
2-Butanone (MEK)	-	-	-	-	-	-	-	-	-	-	-	-	< 5	-	-	-	-	-	< 5	-	-	-
Carbon disulfide	-	-	-	-	<2	-	< 100	<2	<2	<2	<2	-	-	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	-	-	-	-	< 1	-	< 50	< 1	< 1	< 1	< 1	-	< 1	-	-	-	-	-	< 1	-	-	-
Chlorobenzene	-	-	-	-	< 1	-	< 50	< 1	< 1	< 1	< 1	-	< 1	-	-	-	-	-	< 1	-	-	-
Chloroethane	-	-	-	-	< 2	-	< 100	< 2	< 2	< 2	< 2	-	< 1	-	-	-	-	-	< 1	-	-	-
Chloroform	-	-	-	-	< 1	-	< 50	< 1	< 1	< 1	< 1	-	< 1	-	-	-	-	-	< 1	-	-	-
Chloromethane	-	-	< 5	< 0.2	-	-	-	-	-	-	-	-	< 1	-	-	-	< 5	< 10	< 1	-	-	< 5
2-Chlorotoluene	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	< 1	-	-	-
4-Chlorotoluene	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	< 1	-	-	-
1,2-Dibromo-3-chloropropane	-	-	-	-	-	-	-	-	-	-	-	-	< 5	-	-	-	-	-	< 5	-	-	-
Dibromochloromethane	-	-	-	-	< 1	-	< 50	< 1	< 1	< 1	< 1	-	< 1	-	-	-	-	-	< 1	-	-	-
1,2-Dibromoethane (EDB)	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	< 1	-	-	-
Dibromomethane	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	< 1	-	-	-
1,2-Dichlorobenzene	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	< 1	-	-	-
1,3-Dichlorobenzene	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	< 1	-	-	-
1,4-Dichlorobenzene	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	< 1	-	-	-
Dichlorodifluoromethane	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	< 1	-	-	-
1,1-Dichloroethane	< 10	< 10	< 5	< 0.2	< 1	-	< 50	< 1	< 1	< 1	< 1	-	< 1	-	< 1	< 1	< 5	< 5	< 1	< 1	< 1	< 5
1,2-Dichloroethane	-	-	-	-	< 1	-	< 50	< 1	< 1	< 1	< 1	-	< 1	-	-	-	-	-	< 1	-	-	-
1,1-Dichloroethene	< 10	< 10	< 5	< 0.3	< 1	-	< 50	< 1	< 1	< 1	< 1	-	< 1	-	-	**5**	< 5	< 5	< 1	-	< 1	< 5
cis-1,2-Dichloroethene	**790**	**1600**	**-**	< 0.2	< 2	**98**	**203**	< 2	< 2	**0.39 J**	< 1	**48**	**1**	< 1	< 1	**74**	-	< 5	< 1	< 1	< 1	**-**
trans-1,2-Dichloroethene	**12**	**25**	**-**	< 0.2	< 1	-	< 50	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	**-**	< 5	< 1	< 1	< 1	**-**
1,2-Dichloropropane	-	-	-	-	< 1	-	< 50	< 1	< 1	< 1	< 1	-	< 1	-	-	-	-	-	< 1	-	-	-
1,3-Dichloropropane	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	< 1	-	-	-
2,2-Dichloropropane	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	< 1	-	-	-
1,1-Dichloropropene	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	< 1	-	-	-
cis-1,3-Dichloropropene	-	-	-	-	< 1	-	< 50	< 1	< 1	< 1	< 1	-	< 1	-	-	-	-	-	< 1	-	-	-
trans-1,3-Dichloropropene	-	-	-	-	< 1	-	< 50	< 1	< 1	< 1	< 1	-	< 1	-	-	-	-	-	< 1	-	-	-
Diisopropyl ether	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	< 1	-	-	-
Ethylbenzene	-	-	-	-	< 1	-	< 50	< 1	< 1	< 1	< 1	-	< 1	-	-	-	-	-	< 1	-	-	-
Hexachloro-1,3-butadiene	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	< 1	-	-	-
2-Hexanone	-	-	-	-	< 10	-	< 500	< 10	< 10	< 10	< 10	-	< 5	-	-	-	-	-	< 5	-	-	-
p-Isopropyltoluene	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	< 1	-	-	-
Methyl bromide	-	-	-	-	< 2	-	< 100	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-	-	-	-
Methyl chloride	-	-	< 5	< 0.2	< 2	-	< 100	< 2	< 2	< 2	< 2	-	-	-	-	-	< 5	< 5	-	-	-	< 5
Methylene Chloride	< 40	< 40	-	-	**2.8 J**	-	< 250	< 2	< 2	< 2	< 2	-	< 2	-	< 4	< 4	-	-	< 2	< 4	< 4	-
Methyl ethyl ketone	-	-	-	-	< 5	-	< 250	< 5	< 5	< 5	< 5	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone (MIBK)	-	-	-	-	< 5	-	< 250	< 5	< 5	< 5	< 5	-	< 5	-	-	-	-	-	< 5	-	-	-
Methyl-tert-butyl ether	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	< 1	-	-	-
Naphthalene	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	< 1	-	-	-
Styrene	-	-	-	-	< 1	-	< 50	< 1	< 1	< 1	< 1	-	< 1	-	-	-	-	-	< 1	-	-	-
1,1,1,2-Tetrachloroethane	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	< 1	-	-	-
1,1,2,2-Tetrachloroethane	-	-	-	-	< 1	-	< 50	< 1	< 1	< 1	< 1	-	< 1	-	-	-	-	-	< 1	-	-	-
Tetrachloroethene	-	-	< 5	< 0.2	< 1	-	< 50	< 1	< 1	< 1	< 1	< 1	< 1	-	-	-	< 5	< 5	< 1	-	-	< 5
Toluene	-	-	-	-	< 1	-	< 50	< 1	< 1	< 1	< 1	-	< 1	-	-	-	-	-	< 1	-	-	-
1,2,3-Trichlorobenzene	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	< 1	-	-	-
1,2,4-Trichlorobenzene	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	< 1	-	-	-
1,1,1-Trichloroethane	-	-	< 5	< 0.1	< 1	-	< 50	< 1	< 1	< 1	< 1	-	< 1	-	-	-	< 5	< 5	< 1	-	-	< 5
1,1,2-Trichloroethane	< 10	< 10	< 5	< 0.2	< 1	-	< 50	< 1	< 1	< 1	< 1	-	< 1	-	< 1	< 1	< 5	<5	< 1	< 1	< 1	< 5
Trichloroethene	**7800**	**12000**	< 5	**1.7**	**6**	**168**	**3470**	**3.6**	**0.34 J**	**2.3**	**2**	**128**	**2.9**	< 1	< 1	**100**	< 5	< 5	< 1	< 1	< 1	< 5
Trichlorofluoromethane	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	< 1	-	-	-
1,2,3-Trichloropropane	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	< 1	-	-	-
Vinyl acetate	-	-	-	-	-	-	-	-	-	-	-	-	< 2	-	-	-	-	-	< 2	-	-	-
Vinyl chloride	< 10	< 10	< 2	< 0.3	< 1	**6.7**	< 50	< 1	< 1	< 1	< 1	**2.6**	< 1	< 1	< 1	< 1	< 2	< 0.3	< 1	< 1	< 1	< 2
m&p-Xylene	-	-	-	-	-	-	-	-	-	-	-	-	< 2	-	-	-	-	-	< 2	-	-	-
o-Xylene	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	< 1	-	-	-
Xylene, Total	-	-	-	-	< 3	-	< 150	< 3	< 3	< 3	< 3	-	-	-	-	-	-	-	-	-	-	-

Notes and Abbreviations:
1. Results shown in **bold** were detected.
2. < - Not detected above the laboratory detection limit.
3. Only detected compounds are shown in table.
4. - Not analyzed.
5. ND = Non Detect

APPENDIX D
HISTORICAL SUMMARY OF VOC CONCENTRATIONS
CARPENTER - GENERAL TIME FACILITY
ATHENS, GEORGIA

Location Name		MW-4I								MW-5I								MW-6I
Sample Date	Dec-07	11/12/2009	11/18/2010	12/22/2011	Mar-00	Aug-02	Dec-07	Mar-10	8/21/2009	3/24/2010	6/60/2010	9/30/2010	11/17/2010	12/27/2011	2/21/2012	9/17/2015	9/12/2016	Mar-00	Aug-02	Dec-07	May-09	8/21/2009
Field Parameters																						
Conductivity, Field (mS/cm)	-	**0.085**	**0.085**	**0.088**	-	-	-	-	-	**0.096**	-	-	**0.098**	**0.101**	**0.098**	**0.109**	**0.101**	-	-	-	-	-
Dissolved Oxygen, Field (mg/L)	-	**2.56**	**2.56**	**2.11**	-	-	-	-	-	**4.97**	-	-	**3.17**	**5.5**	**1.79**	**1.87**	**2.2**	-	-	-	-	-
ORP, Field (mV)	-	**159.2**	**159.2**	**19.5**	-	-	-	-	-	**-140.7**	-	-	**95.8**	**49.1**	**73.2**	**121**	**92**	-	-	-	-	-
pH, Field (NTU)	-	**5.99**	**5.99**	**6.21**	-	-	-	-	-	**6.36**	-	-	**6.27**	**6.53**	**6.39**	**6.8**	**6.26**	-	-	-	-	-
Temperature, Field (Deg C)	-	**15.76**	**15.76**	**17.4**	-	-	-	-	-	**23.32**	-	-	**23.41**	**20.5**	**21.7**	**24.71**	**26.36**	-	-	-	-	-
Turbidity, Field (NTU)	-	**6.6**	**6.6**	**6.3**	-	-	-	-	-	**3.62**	-	-	**13.7**	**5.1**	**2.3**	**0.0**	**0.0**	-	-	-	-	-
General Chemistry (mg/L)																						
Alkalinity, Total (as CaCO3)	-	**48.3**	**42.8**	**41**	-	-	-	-	**40.4**	**32.9**	**34**	**42.1**	**40.4**	**44.1**	**43.2**	-	-	-	-	-	-	**22.8**
Carbon Dioxide	-	**50**	**119**	-	-	-	-	-	**54**	**66.8**	**70**	**55.9**	**85.4**	-	-	-	-	-	-	-	-	**149**
Chloride	-	**5.1**	-	-	-	-	-	-	**3.4**	**3.4**	**3.1**	-	-	-	-	-	-	-	-	-	-	**7.2**
Nitrate	-	**0.74**	**0.66**	**0.67**	-	-	-	-	**0.81**	**1.2**	**0.83**	**0.73**	**0.72**	**0.84**	**0.84**	-	-	-	-	-	-	**1.1**
Nitrite (as N)	-	< 0.10	< 0.10	< 0.1	-	-	-	-	< 0.10	**0.1**	< 0,10	< 0,10	< 0.10	< 0.1	< 0.1	-	-	-	-	-	-	< 0.10
Nitrite/Nitrate Nitrogen	-	**0.74**	**0.66**	**0.67**	-	-	-	-	**0.81**	**1.3**	**0.83**	**0.73**	**0.72**	**0.84**	**0.84**	-	-	-	-	-	-	**1.1**
Sulfate	-	< 2	< 2	< 5	-	-	-	-	< 2	**6**	< 2	< 2	< 2	< 5	< 5	-	-	-	-	-	-	< 2
Sulfide	-	< 1	< 1	< 0.1	-	-	-	-	< 1	< 1	< 1	< 1	< 1	< 0.1	< 0.1	-	-	-	-	-	-	< 1
Total Organic Carbon (TOC)	-	-	< 1	**13.6**	-	-	-	-	-	**1.1**	< 1	< 1	< 1	**1.5**	**1.6**	-	-	-	-	-	-	-
Dissolved Gases(ug/L)																						
Ethane	-	< 1	< 1	< 10	-	-	-	-	< 1	< 1	< 1	< 1	< 1	< 10	< 12.4	-	-	-	-	-	-	< 1
Ethene	-	< 1	< 1	< 10	-	-	-	-	< 1	< 1	< 1	< 1	< 1	< 10	< 12.4	-	-	-	-	-	-	< 1
Methane	-	< 0.50	**0.26**	< 10	-	-	-	-	< 0.50	**0.17 J**	**0.39 J**	**0.46**	**0.87**	< 10	< 6.6	-	-	-	-	-	-	< 0.5
Volatile Fatty Acids(mg/L)																						
Acetic Acid	-	-	-	< 0.070	-	-	-	-	-	-	-	-	-	< 0.070	**0.016 J**	-	-	-	-	-	-	-
Butyric Acid	-	-	-	< 0.050	-	-	-	-	-	-	-	-	-	< 0.050	< 0.050	-	-	-	-	-	-	-
Lactic Acid	-	-	-	< 0.10	-	-	-	-	-	-	-	-	-	**0.13**	**0.76**	-	-	-	-	-	-	-
Propionic Acid	-	-	-	< 0.050	-	-	-	-	-	-	-	-	-	< 0.050	< 0.050	-	-	-	-	-	-	-
Pyruvic Acid	-	-	-	< 0.15	-	-	-	-	-	-	-	-	-	< 0.15	< 0.15	-	-	-	-	-	-	-
Dissolved Hydrogen (nM)																						
Hydrogen	-	-	-	**1.4**	-	-	-	-	-	-	-	-	-	**1.8**	**0.86**	-	-	-	-	-	-	-
Inorganic Compounds(ug/L)																						
Iron, Dissolved	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron, Ferrous	-	**0.11**	< 0.10	-	-	-	-	-	**0.42**	< 0.10	< 0.10	< 0.10	< 0.10	-	-	-	-	-	-	-	-	< 0.10
Manganese, Dissolved	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds (ug/L)																						
Acetone	-	< 25	< 25	< 25	-	-	-	-	-	< 25	< 25	< 25	< 25	< 25	-	-	-	-	-	-	-	-
Benzene	-	< 1	< 1	< 1	-	-	-	-	-	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-
Bromobenzene	-	-	-	< 1	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Bromochloromethane	-	-	-	< 1	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Bromodichloromethane	-	< 1	< 1	< 1	-	-	-	-	-	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-
Bromoform	-	< 1	< 1	< 1	-	-	-	-	-	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-
Bromomethane	-	-	-	< 2	-	-	-	-	-	-	-	-	-	< 2	-	-	-	-	-	-	-	-
2-Butanone (MEK)	-	-	-	< 5	-	-	-	-	-	-	-	-	-	< 5	-	-	-	-	-	-	-	-
Carbon disulfide	-	< 2	< 2	-	-	-	-	-	-	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	-	< 1	< 1	< 1	-	-	-	-	-	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-
Chlorobenzene	-	< 1	< 1	< 1	-	-	-	-	-	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-
Chloroethane	-	< 2	< 2	< 1	-	-	-	-	-	< 2	< 2	< 2	< 2	< 1	-	-	-	-	-	-	-	-
Chloroform	-	**0.64 J**	**0.59 J**	< 1	-	-	-	-	-	< 1	**0.29 J**	**0.38 J**	**0.36 J**	< 1	-	-	-	-	-	-	-	-
Chloromethane	< 10	-	-	< 1	< 10	< 10	< 5	< 1	-	-	-	-	-	< 1	-	-	-	< 20	< 20	< 5	-	-
2-Chlorotoluene	-	-	-	< 1	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
4-Chlorotoluene	-	-	-	< 1	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane	-	-	-	< 5	-	-	-	-	-	-	-	-	-	< 5	-	-	-	-	-	-	-	-
Dibromochloromethane	-	< 1	< 1	< 1	-	-	-	-	-	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-
1,2-Dibromoethane (EDB)	-	-	-	< 1	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Dibromomethane	-	-	-	< 1	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	-	-	-	< 1	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	-	-	-	< 1	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	-	-	-	< 1	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	-	-	-	< 1	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,1-Dichloroethane	< 5	< 1	< 1	< 1	< 5	< 5	< 5	< 1	-	< 1	< 1	< 1	< 1	< 1	-	< 1	< 1	< 10	< 10	< 5	-	-
1,2-Dichloroethane	-	< 1	< 1	< 1	-	-	-	-	-	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-
1,1-Dichloroethene	< 5	**0.57 J**	**0.43 J**	< 1	< 5	< 5	< 5	< 1	-	< 1	< 1	< 1	< 1	< 1	-	-	< 1	< 10	< 10	< 5	-	-
cis-1,2-Dichloroethene	< 5	< 2	< 2	< 1	-	-	< 5	**1**	**1.9**	**1.2**	**2**	**2.5**	**2.4**	**2.8**	**2.2**	**3**	**3**	-	-	**80**	**74.2**	**63.9**
trans-1,2-Dichloroethene	< 5	< 1	< 1	< 1	-	-	< 5	< 1	-	< 1	< 1	**1.3**	< 1	< 1	< 1	< 1	< 1	-	-	< 5	-	-
1,2-Dichloropropane	-	< 1	< 1	< 1	-	-	-	-	-	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-
1,3-Dichloropropane	-	-	-	< 1	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
2,2-Dichloropropane	-	-	-	< 1	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,1-Dichloropropene	-	-	-	< 1	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	-	< 1	< 1	< 1	-	-	-	-	-	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	-	< 1	< 1	< 1	-	-	-	-	-	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-
Diisopropyl ether	-	-	-	< 1	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Ethylbenzene	-	< 1	< 1	< 1	-	-	-	-	-	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-
Hexachloro-1,3-butadiene	-	-	-	< 1	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
2-Hexanone	-	< 10	< 10	< 5	-	-	-	-	-	< 10	< 10	< 10	< 10	< 5	-	-	-	-	-	-	-	-
p-Isopropyltoluene	-	-	-	< 1	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Methyl bromide	-	< 2	< 2	-	-	-	-	-	-	< 2	< 2	< 2	< 2	-	-	-	-	-	-	-	-	-
Methyl chloride	< 5	< 2	< 2	-	< 5	< 5	< 5	< 1	-	< 2	< 2	< 2	< 2	-	-	-	-	< 10	< 10	< 5	-	-
Methylene Chloride	-	< 2	< 2	< 2	-	-	-	-	-	< 2	< 2	< 2	< 2	< 2	-	< 4	< 4	-	-	-	-	-
Methyl ethyl ketone	-	< 5	< 5	-	-	-	-	-	-	< 5	< 5	< 5	< 5	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone (MIBK)	-	< 5	< 5	< 5	-	-	-	-	-	< 5	< 5	< 5	< 5	< 5	-	-	-	-	-	-	-	-
Methyl-tert-butyl ether	-	-	-	< 1	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Naphthalene	-	-	-	< 1	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Styrene	-	< 1	< 1	< 1	-	-	-	-	-	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-
1,1,1,2-Tetrachloroethane	-	-	-	< 1	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	-	< 1	< 1	< 1	-	-	-	-	-	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-
Tetrachloroethene	< 5	< 1	< 1	< 1	< 5	< 5	< 5	< 1	-	< 1	< 1	< 1	< 1	< 1	-	-	-	< 10	< 10	< 5	-	-
Toluene	-	< 1	< 1	< 1	-	-	-	-	-	< 1	< 1	**1.1**	**1.1**	< 1	-	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	-	-	-	< 1	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	-	-	-	< 1	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	< 5	< 1	< 1	< 1	< 5	< 5	< 5	< 1	-	< 1	< 1	< 1	< 1	< 1	-	-	-	< 10	< 10	< 5	-	-
1,1,2-Trichloroethane	<5	< 1	< 1	< 1	< 5	< 5	< 5	< 1	-	< 1	< 1	< 1	< 1	< 1	-	< 1	< 1	< 10	< 10	< 5	-	-
Trichloroethene	< 5	**3.2**	**2.1**	**1.9**	**45**	**110**	**110**	**73**	**104**	**72.8**	**91.2**	**89.4**	**98.1**	**96.1**	< 1	**81**	**78**	**210**	**260**	**380**	**493**	**435**
Trichlorofluoromethane	-	-	-	< 1	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,2,3-Trichloropropane	-	-	-	< 1	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Vinyl acetate	-	-	-	< 2	-	-	-	-	-	-	-	-	-	< 2	-	-	-	-	-	-	-	-
Vinyl chloride	< 0.3	< 1	< 1	< 1	< 2	< 2	< 2	< 1	< 2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 4	< 4	< 2	< 2	< 5
m&p-Xylene	-	-	-	< 2	-	-	-	-	-	-	-	-	-	< 2	-	-	-	-	-	-	-	-
o-Xylene	-	-	-	< 1	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Xylene, Total	-	< 3	< 3	-	-	-	-	-	-	< 3	< 3	< 3	< 3	-	-	-	-	-	-	-	-	-

Notes and Abbreviations:
1. Results shown in **bold** were detected.
2. < - Not detected above the laboratory detection limit.
3. Only detected compounds are shown in table.
4. - Not analyzed.
5. ND = Non Detect

APPENDIX D
HISTORICAL SUMMARY OF VOC CONCENTRATIONS
CARPENTER - GENERAL TIME FACILITY
ATHENS, GEORGIA

Location Name	MW-7I																MW-8I					
Sample Date	11/17/2010	12/19/2011	9/17/2015	9/9/2016	Mar-00	Aug-02	Dec-07	May-09	8/20/2009	3/24/2010	6/30/2010	9/30/2010	12/27/2011	2/21/2012	9/17/2015	9/12/2016	Mar-00	Aug-02	Dec-07	May-09	8/21/2009	11/12/2009
Field Parameters																						
Conductivity, Field (mS/cm)	**0.007**	**0.74**	**0.082**	**0.094**	-	-	-	-	-	**0.135**	-	-	**0.122**	**0.124**	**0.126**	**0.118**	-	-	-	-	-	**0.336**
Dissolved Oxygen, Field (mg/L)	**8.64**	**1.33**	**3.85**	**0.76**	-	-	-	-	-	**0.35**	-	-	**0.35**	**0.12**	**0.58**	**0.57**	-	-	-	-	-	**9.29**
ORP, Field (mV)	**120.4**	**209.1**	**114**	**200**	-	-	-	-	-	**-150.6**	-	-	**45.9**	**21**	**129**	**67**	-	-	-	-	-	**153.1**
pH, Field (NTU)	**5.99**	**5.64**	**6.82**	**5.59**	-	-	-	-	-	**5.8**	-	-	**6.2**	**6.19**	**6.46**	**6.15**	-	-	-	-	-	**5.4**
Temperature, Field (Deg C)	**20.83**	**19.3**	**23.84**	**24.21**	-	-	-	-	-	**20.66**	-	-	**18.8**	**19.3**	**23.43**	**26.54**	-	-	-	-	-	**21.59**
Turbidity, Field (NTU)	**4.2**	**7.9**	**0.0**	**9.8**	-	-	-	-	-	**122.0**	-	-	**5**	**0.9**	**0.0**	**0.0**	-	-	-	-	-	**3.7**
General Chemistry (mg/L)																						
Alkalinity, Total (as CaCO3)	-	-	-	-	-	-	-	-	**71.4**	**74**	**54**	**51.7**	**57.8**	**46.4**	-	-	-	-	-	-	**17.2**	-
Carbon Dioxide	-	-	-	-	-	-	-	-	**64.1**	**154**	**135**	**77.4**	-	-	-	-	-	-	-	-	**200**	-
Chloride	-	-	-	-	-	-	-	-	**6**	**5.7**	**5.2**	-	-	-	-	-	-	-	-	-	**5.4**	-
Nitrate	-	-	-	-	-	-	-	-	< 0.10	< 0.10	**0.13**	< 0.10	< 0.2	< 0.2	-	-	-	-	-	-	**1.1**	-
Nitrite (as N)	-	-	-	-	-	-	-	-	< 0.10	< 0.10	< 0.10	< 0.10	< 0.1	< 0.1	-	-	-	-	-	-	< 0.10	-
Nitrite/Nitrate Nitrogen	-	-	-	-	-	-	-	-	< 0.20	< 0.20	< 0.20	< 0.20	< 0.2	< 0.2	-	-	-	-	-	-	**1.1**	-
Sulfate	-	-	-	-	-	-	-	-	< 2	< 2	< 2	< 2	< 5	< 5	-	-	-	-	-	-	**79.2**	-
Sulfide	-	-	-	-	-	-	-	-	< 1	< 1	**1.3**	< 1	< 0.1	< 0.1	-	-	-	-	-	-	< 1	-
Total Organic Carbon (TOC)	-	-	-	-	-	-	-	-	-	**1**	<1	< 1	**2.4**	**18.8**	-	-	-	-	-	-	-	-
Dissolved Gases(ug/L)																						
Ethane	-	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	< 10	< 12.4	-	-	-	-	-	-	< 1	-
Ethene	-	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	< 10	< 12.4	-	-	-	-	-	-	< 1	-
Methane	-	-	-	-	-	-	-	-	**83.3**	**65.3**	**69.4**	**63.9**	**206**	**135**	-	-	-	-	-	-	< 0.5	-
Volatile Fatty Acids(mg/L)																						
Acetic Acid	-	-	-	-	-	-	-	-	-	-	-	-	< 0.070	**0.013 J**	-	-	-	-	-	-	-	-
Butyric Acid	-	-	-	-	-	-	-	-	-	-	-	-	< 0.050	< 0.050	-	-	-	-	-	-	-	-
Lactic Acid	-	-	-	-	-	-	-	-	-	-	-	-	**0.19**	**0.5**	-	-	-	-	-	-	-	-
Propionic Acid	-	-	-	-	-	-	-	-	-	-	-	-	< 0.050	< 0.050	-	-	-	-	-	-	-	-
Pyruvic Acid	-	-	-	-	-	-	-	-	-	-	-	-	< 0.15	< 0.15	-	-	-	-	-	-	-	-
Dissolved Hydrogen (nM)																						
Hydrogen	-	-	-	-	-	-	-	-	-	-	-	-	**1.3**	**1.4**	-	-	-	-	-	-	-	-
Inorganic Compounds(ug/L)																						
Iron, Dissolved	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron, Ferrous	-	-	-	-	-	-	-	-	< 0,10	< 0,10	< 0,10	< 0,10	-	-	-	-	-	-	-	-	< 0.10	-
Manganese, Dissolved	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds (ug/L)																						
Acetone	< 130	< 25	-	-	-	-	-	-	-	< 25	< 25	< 25	< 25	-	-	-	-	-	-	-	-	< 25
Benzene	< 5	< 1	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-	< 1
Bromobenzene	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
Bromochloromethane	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
Bromodichloromethane	< 5	< 1	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-	< 1
Bromoform	< 5	< 1	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-	< 1
Bromomethane	-	< 2	-	-	-	-	-	-	-	-	-	-	< 2	-	-	-	-	-	-	-	-	-
2-Butanone (MEK)	-	< 5	-	-	-	-	-	-	-	-	-	-	< 5	-	-	-	-	-	-	-	-	-
Carbon disulfide	< 10	-	-	-	-	-	-	-	-	< 2	< 2	< 2	-	-	-	-	-	-	-	-	-	< 2
Carbon tetrachloride	< 5	< 1	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-	< 1
Chlorobenzene	< 5	< 1	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-	< 1
Chloroethane	< 10	< 1	-	-	-	-	-	-	-	< 2	< 2	< 2	< 1	-	-	-	-	-	-	-	-	< 2
Chloroform	**1.5 J**	**1.5**	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-	< 1
Chloromethane	-	< 1	-	-	< 10	< 10	< 5	-	-	-	-	-	< 1	-	-	-	< 10	< 10	< 5	-	-	-
2-Chlorotoluene	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
4-Chlorotoluene	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane	-	< 5	-	-	-	-	-	-	-	-	-	-	< 5	-	-	-	-	-	-	-	-	-
Dibromochloromethane	< 5	< 1	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-	< 1
1,2-Dibromoethane (EDB)	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
Dibromomethane	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	< 5	< 1	< 1	< 1	< 5	< 5	< 5	-	-	< 1	< 1	< 1	< 1	-	< 1	< 1	< 5	< 5	< 5	-	-	< 1
1,2-Dichloroethane	< 5	< 1	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-	< 1
1,1-Dichloroethene	< 5	**1.6**	-	< 1	< 5	< 5	< 5	-	-	< 1	< 1	< 1	< 1	-	-	< 1	< 5	< 5	< 5	-	-	< 1
cis-1,2-Dichloroethene	**59.7**	**70.6**	< 1	**49**	-	-	< 5	**3**	**2.3**	**1.6**	**1.4**	**1.8**	**2.5**	**2.3**	**3**	**2**	-	-	< 5	< 0.56	**1.2**	< 1
trans-1,2-Dichloroethene	< 5	< 1	< 1	< 1	-	-	< 5	-	-	< 1	< 1	< 1	< 1	< 1	< 1	< 1	-	-	< 5	-	-	< 1
1,2-Dichloropropane	< 5	< 1	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-	< 1
1,3-Dichloropropane	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
2,2-Dichloropropane	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
1,1-Dichloropropene	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	< 5	< 1	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-	< 1
trans-1,3-Dichloropropene	< 5	< 1	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-	< 1
Diisopropyl ether	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
Ethylbenzene	< 5	< 1	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-	< 1
Hexachloro-1,3-butadiene	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
2-Hexanone	< 50	< 5	-	-	-	-	-	-	-	< 10	< 10	< 10	< 5	-	-	-	-	-	-	-	-	< 10
p-Isopropyltoluene	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
Methyl bromide	< 10	-	-	-	-	-	-	-	-	< 2	< 2	< 2	-	-	-	-	-	-	-	-	-	< 2
Methyl chloride	< 10	-	-	-	< 5	< 5	< 5	-	-	< 2	< 2	< 2	-	-	-	-	< 5	< 5	< 5	-	-	< 2
Methylene Chloride	< 25	< 2	< 4	< 4	-	-	-	-	-	< 5	< 5	< 5	< 2	-	< 4	< 4	-	-	-	-	-	< 5
Methyl ethyl ketone	< 25	-	-	-	-	-	-	-	-	< 5	< 5	< 5	-	-	-	-	-	-	-	-	-	< 5
4-Methyl-2-pentanone (MIBK)	< 25	< 5	-	-	-	-	-	-	-	< 5	< 5	< 5	< 5	-	-	-	-	-	-	-	-	< 5
Methyl-tert-butyl ether	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
Naphthalene	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
Styrene	< 5	< 1	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-	< 1
1,1,1,2-Tetrachloroethane	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	< 5	< 1	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-	< 1
Tetrachloroethene	< 5	< 1	-	-	< 5	< 5	< 5	-	-	< 1	< 1	< 1	< 1	-	-	-	< 5	< 5	< 5	-	-	< 1
Toluene	< 5	< 1	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-	< 1
1,2,3-Trichlorobenzene	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	< 5	< 1	-	-	< 5	< 5	< 5	-	-	< 1	< 1	< 1	< 1	-	-	-	< 5	< 5	< 5	-	-	< 1
1,1,2-Trichloroethane	< 5	< 1	< 1	< 1	< 5	< 5	< 5	-	-	< 1	< 1	< 1	< 1	-	< 1	< 1	< 5	< 5	< 5	-	-	< 1
Trichloroethene	**380**	**438**	**7**	**410**	**23**	**14**	**23**	**15.5**	**12.7**	**7.2**	**5**	**6.6**	**2.3**	**1**	< 1	< 1	**16**	< 5	< 5	**8.6**	**15.3**	**0.36 J**
Trichlorofluoromethane	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
1,2,3-Trichloropropane	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
Vinyl acetate	-	< 2	-	-	-	-	-	-	-	-	-	-	< 2	-	-	-	-	-	-	-	-	-
Vinyl chloride	< 5	< 1	< 1	< 1	< 2	< 2	< 2	< 2	< 1	< 1	< 1	< 1	< 1	< 1	**5**	**3**	< 2	< 2	< 2	< 2	< 1	< 1
m&p-Xylene	-	< 2	-	-	-	-	-	-	-	-	-	-	< 2	-	-	-	-	-	-	-	-	-
o-Xylene	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-
Xylene, Total	< 15	-	-	-	-	-	-	-	-	< 3	< 3	< 3	-	-	-	-	-	-	-	-	-	< 3

Notes and Abbreviations:
1. Results shown in **bold** were detected.
2. < - Not detected above the laboratory detection limit.
3. Only detected compounds are shown in table.
4. - Not analyzed.
5. ND = Non Detect

APPENDIX D
HISTORICAL SUMMARY OF VOC CONCENTRATIONS
CARPENTER - GENERAL TIME FACILITY
ATHENS, GEORGIA

Location Name											MW-9D									
Sample Date	11/17/2010	12/27/2011	10/13/2014	9/17/2015	9/12/2016	Mar-00	Dec-07	May-09	8/20/2009	3/24/2010	6/30/2010	9/30/2010	12/21/2011	2/21/2012	9/17/2015	9/9/2016	Mar-00	Aug-02	Dec-07	May-09	8/20/2009
Field Parameters																					
Conductivity, Field (mS/cm)	**0.336**	**0.312**	-	**0.32**	**0.246**	-	-	-	-	**0.156**	-	-	**0.166**	**0.167**	**0.203**	**0.184**	-	-	-	-	-
Dissolved Oxygen, Field (mg/L)	**9.29**	**7.85**	-	**2.1**	**1.32**	-	-	-	-	**0.62**	-	-	**0.51**	**0.27**	**1.72**	**0.57**	-	-	-	-	-
ORP, Field (mV)	**153.1**	**149**	-	**193**	**155**	-	-	-	-	**-187.1**	-	-	**-171**	**-115**	**51**	**-151**	-	-	-	-	-
pH, Field (NTU)	**5.4**	**5.46**	-	**5.85**	**5.47**	-	-	-	-	**8.76**	-	-	**8.62**	**8.8**	**7.85**	**8.19**	-	-	-	-	-
Temperature, Field (Deg C)	**21.59**	**16.2**	-	**25.8**	**28.83**	-	-	-	-	**17.04**	-	-	**19.9**	**18.4**	**27.4**	**24.49**	-	-	-	-	-
Turbidity, Field (NTU)	**3.7**	**4.2**	-	**2.5**	**0**	-	-	-	-	**23.3**	-	-	**1.5**	**4**	**0.5**	**0**	-	-	-	-	-
General Chemistry (mg/L)																					
Alkalinity, Total (as CaCO3)	-	-	-	-	-	-	-	-	69.6	**90.1**	**71**	**85.1**	**84.4**	**84.8**	-	-	-	-	-	-	**50**
Carbon Dioxide	-	-	-	-	-	-	-	-	**72.3**	**78.9**	**62**	**74.8**	-	-	-	-	-	-	-	-	**146**
Chloride	-	-	-	-	-	-	-	-	**4**	**3.5**	**3.2**	-	-	-	-	-	-	-	-	-	**6.1**
Nitrate	-	-	-	-	-	-	-	-	< 0.10	**0.12**	< 0.10	< 0.10	< 0.2	< 0.2	-	-	-	-	-	-	**0.58**
Nitrite (as N)	-	-	-	-	-	-	-	-	< 0.10	< 0.10	< 0.10	< 0.10	< 0.1	< 0.1	-	-	-	-	-	-	< 0.10
Nitrite/Nitrate Nitrogen	-	-	-	-	-	-	-	-	< 0.20	< 0.20	< 0.20	< 0.20	< 0.2	< 0.2	-	-	-	-	-	-	**0.68**
Sulfate	-	-	-	-	-	-	-	-	**6.4**	**1.2**	**7.6**	**6.9**	**9.1**	**9.2**	-	-	-	-	-	-	< 2
Sulfide	-	-	-	-	-	-	-	-	< 1	**1.2**	**1.1**	**3.3**	< 0.1	< 0.1	-	-	-	-	-	-	< 1
Total Organic Carbon (TOC)	-	-	-	-	-	-	-	-	-	**1.2**	< 1	**1**	**2.2**	**2.7**	-	-	-	-	-	-	-
Dissolved Gases(ug/L)																					
Ethane	-	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	< 10	< 12.4	-	-	-	-	-	-	< 1
Ethene	-	-	-	-	-	-	-	-	< 1	**1.2**	**0.97**	**1.1**	< 10	< 12.4	-	-	-	-	-	-	< 1
Methane	-	-	-	-	-	-	-	-	**0.24**	**1.29**	**0.91**	**1.56**	< 10	< 6.6	-	-	-	-	-	-	**5.66**
Volatile Fatty Acids(mg/L)																					
Acetic Acid	-	-	-	-	-	-	-	-	-	-	-	-	**0.32**	**0.019 J**	-	-	-	-	-	-	-
Butyric Acid	-	-	-	-	-	-	-	-	-	-	-	-	**0.15**	< 0.050	-	-	-	-	-	-	-
Lactic Acid	-	-	-	-	-	-	-	-	-	-	-	-	**0.13**	**0.027**	-	-	-	-	-	-	-
Propionic Acid	-	-	-	-	-	-	-	-	-	-	-	-	**0.10**	< 0.050	-	-	-	-	-	-	-
Pyruvic Acid	-	-	-	-	-	-	-	-	-	-	-	-	< 0.15	< 0.15	-	-	-	-	-	-	-
Dissolved Hydrogen (nM)																					
Hydrogen	-	-	-	-	-	-	-	-	-	-	-	-	**1.9**	**1.1**	-	-	-	-	-	-	-
Inorganic Compounds(ug/L)																					
Iron, Dissolved	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron, Ferrous	-	-	-	-	-	-	-	-	< 0,10	< 0.10	**0.31**	**4**	-	-	-	-	-	-	-	-	< 0.10
Manganese, Dissolved	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds (ug/L)																					
Acetone	< 25	< 25	-	-	-	-	-	-	-	< 25	< 25	< 25	< 25	-	-	-	-	-	-	-	-
Benzene	< 1	< 1	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-
Bromobenzene	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Bromochloromethane	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Bromodichloromethane	< 1	< 1	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-
Bromoform	< 1	< 1	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-
Bromomethane	-	< 2	-	-	-	-	-	-	-	-	-	-	< 2	-	-	-	-	-	-	-	-
2-Butanone (MEK)	-	< 5	-	-	-	-	-	-	-	-	-	-	< 5	-	-	-	-	-	-	-	-
Carbon disulfide	< 2	-	-	-	-	-	-	-	-	< 2	< 2	< 2	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	< 1	< 1	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-
Chlorobenzene	< 1	< 1	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-
Chloroethane	< 2	< 1	-	-	-	-	-	-	-	< 2	< 2	< 2	< 1	-	-	-	-	-	-	-	-
Chloroform	< 1	< 1	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-
Chloromethane	-	< 1	-	-	-	< 10	< 10	-	-	-	-	-	< 1	-	-	-	< 100	< 100	< 5	-	-
2-Chlorotoluene	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
4-Chlorotoluene	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane	-	< 5	-	-	-	-	-	-	-	-	-	-	< 5	-	-	-	-	-	-	-	-
Dibromochloromethane	< 1	< 1	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-
1,2-Dibromoethane (EDB)	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Dibromomethane	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,1-Dichloroethane	< 1	< 1	< 5	< 1	< 1	< 5	< 5	-	-	< 1	< 1	< 1	< 1	-	< 1	< 1	< 50	< 50	< 5	-	-
1,2-Dichloroethane	< 1	< 1	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-
1,1-Dichloroethene	< 1	< 1	-	-	< 1	< 5	< 5	-	-	< 1	< 1	< 1	< 1	-	-	< 1	< 50	< 50	< 5	-	-
cis-1,2-Dichloroethene	< 1	< 1	< 5	< 1	< 1	-	< 5	< 1	**5.7**	< 1	< 1	< 1	< 1	< 1	< 1	< 1	-	-	**160**	**136**	**117**
trans-1,2-Dichloroethene	< 1	< 1	< 5	< 1	< 1	-	< 5	-	-	< 1	< 1	< 1	< 1	< 1	< 1	< 1	-	-	< 5	-	-
1,2-Dichloropropane	< 1	< 1	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-
1,3-Dichloropropane	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
2,2-Dichloropropane	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,1-Dichloropropene	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	< 1	< 1	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	< 1	< 1	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-
Diisopropyl ether	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Ethylbenzene	< 1	< 1	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-
Hexachloro-1,3-butadiene	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
2-Hexanone	< 10	< 5	-	-	-	-	-	-	-	< 10	< 10	< 10	< 5	-	-	-	-	-	-	-	-
p-Isopropyltoluene	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Methyl bromide	< 2	-	-	-	-	-	-	-	-	< 2	< 2	< 2	-	-	-	-	-	-	-	-	-
Methyl chloride	< 2	-	-	-	-	< 5	< 5	-	-	< 2	< 2	< 2	-	-	-	-	< 50	< 50	< 5	-	-
Methylene Chloride	< 5	< 2	< 5	< 4	< 4	-	-	-	-	< 5	< 5	< 5	< 2	-	< 4	< 4	-	-	-	-	-
Methyl ethyl ketone	< 5	-	-	-	-	-	-	-	-	< 5	< 5	< 5	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone (MIBK)	< 5	< 5	-	-	-	-	-	-	-	< 5	< 5	< 5	< 5	-	-	-	-	-	-	-	-
Methyl-tert-butyl ether	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Naphthalene	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Styrene	< 1	< 1	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-
1,1,1,2-Tetrachloroethane	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	< 1	< 1	-	-	-	-	-	-	-	< 1	< 1	< 1	< 1	-	-	-	-	-	-	-	-
Tetrachloroethene	< 1	< 1	-	-	-	< 5	< 5	-	-	< 1	< 1	< 1	< 1	-	-	-	< 50	< 50	< 5	-	-
Toluene	**2.6**	< 1	-	-	-	-	-	-	-	**0.25 J**	**0.44 J**	**3.3**	< 1	-	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	< 1	< 1	-	-	-	< 5	< 5	-	-	< 1	< 1	< 1	< 1	-	-	-	< 50	< 50	< 5	-	-
1,1,2-Trichloroethane	< 1	< 1	< 5	< 1	< 1	< 5	< 5	-	-	< 1	< 1	< 1	< 1	-	< 1	< 1	< 50	< 50	< 5	-	-
Trichloroethene	**0.73 J**	< 1	< 5	< 1	< 1	< 5	< 5	**< 1**	**191**	**1.1**	**0.63 J**	**0.79 J**	< 1	< 1	< 1	< 1	**1700**	**1400**	**1900**	**1710**	**1520**
Trichlorofluoromethane	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,2,3-Trichloropropane	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Vinyl acetate	-	< 2	-	-	-	-	-	-	-	-	-	-	< 2	-	-	-	-	-	-	-	-
Vinyl chloride	< 1	< 1	< 2	< 1	< 1	< 2	< 2	< 1	< 2	**0.88 J**	**0.88 J**	**0.84 J**	**1.2**	**1.2**	< 1	**1**	< 20	< 20	< 2	< 20	< 20
m&p-Xylene	-	< 2	-	-	-	-	-	-	-	-	-	-	< 2	-	-	-	-	-	-	-	-
o-Xylene	-	< 1	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Xylene, Total	< 3	-	-	-	-	-	-	-	-	< 3	< 3	< 3	-	-	-	-	-	-	-	-	-

Notes and Abbreviations:
1. Results shown in **bold** were detected.
2. < - Not detected above the laboratory detection limit.
3. Only detected compounds are shown in table.
4. - Not analyzed.
5. ND = Non Detect

APPENDIX D
HISTORICAL SUMMARY OF VOC CONCENTRATIONS
CARPENTER - GENERAL TIME FACILITY
ATHENS, GEORGIA

Location Name	MW-9I							MW-10IR	MW-10D	MW-11D											
Sample Date	3/24/2010	6/29/2010	9/30/2010	12/21/2011	2/21/2012	9/17/2015	9/9/2016	Mar-00	Mar-00	Apr-00	5/29/2009	8/20/2009	3/23/2010	6/30/2010	9/29/2010	11/17/2010	12/22/2011	2/20/2012	9/18/2015	9/8/2016	Mar-00	Aug-02
Field Parameters																						
Conductivity, Field (mS/cm)	**0.123**	-	-	**0.122**	**0.129**	**0.137**	**0.169**	-	-	-	**0.082**	-	**0.596**	-	-	**0.683**	**0.98**	**0.87**	**0.288**	**0.678**	-	-
Dissolved Oxygen, Field (mg/L)	**0.72**	-	-	**0.35**	**0.39**	**2.59**	**0.32**	-	-	-	**12.8**	-	**0.12**	-	-	**0.53**	**0.69**	**-0.7**	**1.84**	**0.25**	-	-
ORP, Field (mV)	**-149**	-	-	**153.6**	**73.5**	**133**	**178**	-	-	-	**82.7**	-	**-291**	-	-	**-296**	**-335**	**-286.9**	**-75**	**-369**	-	-
pH, Field (NTU)	**5.97**	-	-	**6.18**	**6.23**	**6.72**	**6.11**	-	-	-	**8.19**	-	**7.32**	-	-	**6.85**	**7.03**	**7.3**	**6.99**	**7.7**	-	-
Temperature, Field (Deg C)	**19.47**	-	-	**19.6**	**18.4**	**24.67**	**25.40**	-	-	-	**16.47**	-	**13.71**	-	-	**15.86**	**16.7**	**15.7**	**18.12**	**19.2**	-	-
Turbidity, Field (NTU)	**66**	-	-	**3**	**1.3**	**0.0**	**0.0**	-	-	-	-	-	**0.96**	-	-	**3.7**	**5.1**	**4.8**	**2.4**	**0**	-	-
General Chemistry (mg/L)																						
Alkalinity, Total (as CaCO3)	**63**	**48**	**57.3**	**61.7**	**59.3**	-	-	-	-	-	**57.1**	**47.8**	**318**	**341**	**461**	**348**	**441**	**376**	-	-	-	-
Carbon Dioxide	**194**	**87**	**79.2**	-	-	-	-	-	-	-	**62.2**	**57.2**	**314**	**318**	**413**	**320**	-	-	-	-	-	-
Chloride	**5.7**	**5.1**	-	-	-	-	-	-	-	-	**6.3**	**7.9**	**65.5**	**70.7**	-	-	-	-	-	-	-	-
Nitrate	**0.53**	**0.55**	**0.5**	**0.48**	**0.48**	-	-	-	-	-	< 0.1	< 0.10	< 0.10	< 0.10	< 0.10	**0.17**	< 0.2	< 0.2	-	-	-	-
Nitrite (as N)	**0.15**	< 0.10	< 0.10	< 0.1	< 0.1	-	-	-	-	-	< 0.1	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	**1.5**	**0.77**	-	-	-	-
Nitrite/Nitrate Nitrogen	**0.68**	**0.55**	**0.5**	**0.48**	**0.48**	-	-	-	-	-	< 0.1	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.2	< 0.2	-	-	-	-
Sulfate	**3.2**	< 2	**2.1**	< 5	< 5	-	-	-	-	-	< 2	< 2	**12**	**7.7**	**5.8**	**14.2**	**5.2**	**7.8**	-	-	-	-
Sulfide	< 1	< 1	< 1	< 0.1	< 0.1	-	-	-	-	-	**2**	**3.3**	**12.1**	**26.4**	**42.4**	**29**	**57.8**	**4.6**	-	-	-	-
Total Organic Carbon (TOC)	< 1	< 1	< 1	**2.4**	**3.2**	-	-	-	-	-	-	-	-	**25.7**	**29.2**	**21.4**	**42.8**	**33.7**	-	-	-	-
Dissolved Gases(ug/L)																						
Ethane	< 1	< 1	< 1	< 10	< 12.4	-	-	-	-	-	< 1	< 1	**1.0**	**4.15**	**1.6**	**1.0**	< 10	< 12.4	-	-	-	-
Ethene	< 1	< 1	< 1	< 10	< 12.4	-	-	-	-	-	**16.6**	**15.4**	**2.7**	< 1	**1.8**	**3.91**	< 10	< 12.4	-	-	-	-
Methane	**0.59**	**2.6**	**10.4**	< 10	**7.3**	-	-	-	-	-	**228**	**366**	**16700**	**20400**	**19600**	**19700**	**28000**	**13000**	-	-	-	-
Volatile Fatty Acids(mg/L)																						
Acetic Acid	-	-	-	**0.084**	**0.012 J**	-	-	-	-	-	-	-	-	-	-	-	**1.8**	**0.82**	-	-	-	-
Butyric Acid	-	-	-	**0.069**	< 0.050	-	-	-	-	-	-	-	-	-	-	-	< 0.050	< 0.050	-	-	-	-
Lactic Acid	-	-	-	**0.10**	**0.032 J**	-	-	-	-	-	-	-	-	-	-	-	**0.17**	**0.32**	-	-	-	-
Propionic Acid	-	-	-	< 0.050	< 0.050	-	-	-	-	-	-	-	-	-	-	-	< 0.050	< 0.050	-	-	-	-
Pyruvic Acid	-	-	-	< 0.15	< 0.15	-	-	-	-	-	-	-	-	-	-	-	< 0.15	< 0.15	-	-	-	-
Dissolved Hydrogen (nM)																						
Hydrogen	-	-	-	**1.0**	**2.7**	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	-
Inorganic Compounds(ug/L)																						
Iron, Dissolved	**-**	**-**	**-**	**-**	**-**	**-**	**-**	-	-	-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iron, Total	**-**	**-**	**-**	**-**	**-**	**-**	**-**	-	-	-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iron, Ferrous	< 0.10	< 0.10	< 0.50	**-**	**-**	**-**	**-**	**-**	**-**	**-**	< 0.10	**0.13**	< 0.10	< 0.10	**0.24**	**0.11**	**-**	**-**	**-**	**-**	**-**	**-**
Manganese, Dissolved	**-**	**-**	**-**	**-**	**-**	**-**	**-**	-	-	-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Manganese, Total	**-**	**-**	**-**	**-**	**-**	**-**	**-**	-	-	-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Volatile Organic Compounds (ug/L)																						
Acetone	< 25	< 25	< 500	< 25	-	-	-	-	-	-	**13.8 J**	-	**10.3 J**	**15.3 J**	**19.1 J**	< 25	< 25	-	-	-	-	-
Benzene	< 1	< 1	< 20	< 1	-	-	-	-	-	-	< 1	-	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-
Bromobenzene	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-
Bromochloromethane	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-
Bromodichloromethane	< 1	< 1	< 20	< 1	-	-	-	-	-	-	< 1	-	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-
Bromoform	< 1	< 1	< 20	< 1	-	-	-	-	-	-	< 1	-	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-
Bromomethane	-	-	-	< 2	-	-	-	-	-	-	-	-	-	-	-	-	< 2	-	-	-	-	-
2-Butanone (MEK)	-	-	-	< 5	-	-	-	-	-	-	-	-	-	-	-	-	< 5	-	-	-	-	-
Carbon disulfide	< 2	< 2	< 40	-	-	-	-	-	-	-	**5.3**	-	< 2	**0.67 J**	**1.0 J**	**1.8 J**	-	-	-	-	-	-
Carbon tetrachloride	< 1	< 1	< 20	< 1	-	-	-	-	-	-	< 1	-	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-
Chlorobenzene	< 1	< 1	< 20	< 1	-	-	-	-	-	-	< 1	-	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-
Chloroethane	< 2	< 2	< 40	< 1	-	-	-	-	-	-	< 2	-	< 2	< 2	< 2	< 2	< 1	-	-	-	-	-
Chloroform	< 1	**0.91 J**	< 20	< 1	-	-	-	-	-	-	**18**	-	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-
Chloromethane	-	-	-	< 1	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-	< 1	-	-	-	< 200	< 100
2-Chlorotoluene	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-
4-Chlorotoluene	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-
1,2-Dibromo-3-chloropropane	-	-	-	< 5	-	-	-	-	-	-	-	-	-	-	-	-	< 5	-	-	-	-	-
Dibromochloromethane	< 1	< 1	< 20	< 1	-	-	-	-	-	-	< 1	-	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-
1,2-Dibromoethane (EDB)	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-
Dibromomethane	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-
1,2-Dichlorobenzene	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-
1,3-Dichlorobenzene	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-
1,4-Dichlorobenzene	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-
Dichlorodifluoromethane	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-
1,1-Dichloroethane	< 1	**1.5**	< 20	**1.2**	-	< 1	< 2	< 5	< 5	< 5	< 1	-	< 1	< 1	< 1	< 1	< 1	-	< 1	< 1	< 100	< 50
1,2-Dichloroethane	< 1	< 1	< 20	< 1	-	-	-	-	-	-	< 1	-	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-
1,1-Dichloroethene	< 1	**4.3**	< 20	**3.4**	-	-	**2**	< 5	< 5	< 5	< 1	-	< 1	< 1	< 1	< 1	< 1	-	-	< 1	< 100	< 50
cis-1,2-Dichloroethene	**2.5**	**111**	**144**	**113**	**91.9**	**34**	**87**	-	-	-	< 1	< 2	**7.9**	**9**	**8.7**	**8**	**8.0**	**7.7**	< 1	**1**	-	-
trans-1,2-Dichloroethene	< 1	**0.49 J**	< 20	< 1	< 10	< 1	< 2	-	-	-	< 1	-	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	-	-
1,2-Dichloropropane	< 1	< 1	< 20	< 1	-	-	-	-	-	-	< 1	-	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-
1,3-Dichloropropane	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-
2,2-Dichloropropane	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-
1,1-Dichloropropene	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-
cis-1,3-Dichloropropene	< 1	< 1	< 20	< 1	-	-	-	-	-	-	< 1	-	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-
trans-1,3-Dichloropropene	< 1	< 1	< 20	< 1	-	-	-	-	-	-	< 1	-	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-
Diisopropyl ether	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-
Ethylbenzene	< 1	< 1	< 20	< 1	-	-	-	-	-	-	< 1	-	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-
Hexachloro-1,3-butadiene	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-
2-Hexanone	< 10	< 10	< 20	< 5	-	-	-	-	-	-	< 10	-	< 10	< 10	< 10	< 10	< 5	-	-	-	-	-
p-Isopropyltoluene	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-
Methyl bromide	< 2	< 2	< 40	-	-	-	-	-	-	-	< 2	-	< 2	< 2	< 2	< 2	-	-	-	-	-	-
Methyl chloride	< 2	< 2	< 40	-	-	-	-	< 5	< 5	< 5	< 2	-	< 2	< 2	< 2	< 2	-	-	-	-	< 5	< 5
Methylene Chloride	< 5	< 5	< 100	< 2	-	< 4	< 4	-	-	-	**8.5**	-	< 2	< 2	< 2	< 2	< 2	-	< 4	< 4	-	-
Methyl ethyl ketone	< 5	< 5	< 100	-	-	-	-	-	-	-	< 5	-	< 5	< 5	< 5	< 5	-	-	-	-	-	-
4-Methyl-2-pentanone (MIBK)	< 5	< 5	< 100	< 5	-	-	-	-	-	-	**2.4 J**	-	< 5	< 5	< 5	< 5	< 5	-	-	-	-	-
Methyl-tert-butyl ether	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-
Naphthalene	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-
Styrene	< 1	< 1	< 20	< 1	-	-	-	-	-	-	< 1	-	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-
1,1,1,2-Tetrachloroethane	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-
1,1,2,2-Tetrachloroethane	< 1	< 1	< 20	< 1	-	-	-	-	-	-	< 1	-	< 1	< 1	< 1	< 1	< 1	-	-	-	-	-
Tetrachloroethene	< 1	**1.2**	< 20	**1.6**	-	-	-	< 5	< 5	< 5	< 1	-	< 1	< 1	< 1	< 1	< 1	-	-	-	< 100	< 50
Toluene	< 1	< 1	< 20	< 1	-	-	-	-	-	-	< 1	-	**0.22 J**	**0.34J**	**0.44J**	**0.41J**	< 1	-	-	-	-	-
1,2,3-Trichlorobenzene	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-
1,2,4-Trichlorobenzene	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-
1,1,1-Trichloroethane	< 1	< 1	< 20	< 1	-	-	-	< 5	< 5	< 5	< 1	-	< 1	< 1	< 1	< 1	< 1	-	-	-	< 100	< 50
1,1,2-Trichloroethane	< 1	**0.43 J**	< 20	< 1	-	< 1	< 2	< 5	< 5	< 5	< 1	-	< 1	< 1	< 1	< 1	< 1	-	< 1	< 1	< 100	< 50
Trichloroethene	**31.8**	**1250**	**1250**	**1110**	**1070**	**420**	**1000**	< 5	< 5	**43**	< 1	**0.55 J**	< 1	< 1	< 1	< 1	< 1	< 1	< 1	**3**	**2200**	**1400**
Trichlorofluoromethane	-	-	-	**1.3**	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-
1,2,3-Trichloropropane	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-
Vinyl acetate	-	-	-	< 2	-	-	-	-	-	-	-	-	-	-	-	-	< 2	-	-	-	-	-
Vinyl chloride	< 1	**0.59 J**	< 20	< 1	< 10	< 1	< 2	< 2	< 2	< 2	**0.83**	**1.1**	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 40	< 20
m&p-Xylene	-	-	-	< 2	-	-	-	-	-	-	-	-	-	-	-	-	< 2	-	-	-	-	-
o-Xylene	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-
Xylene, Total	< 3	< 3	< 60	-	-	-	-	-	-	-	< 3	-	< 3	< 3	< 3	< 3	-	-	-	-	-	-

Notes and Abbreviations:
1. Results shown in **bold** were detected.
2. < - Not detected above the laboratory detection limit.
3. Only detected compounds are shown in table.
4. - Not analyzed.
5. ND = Non Detect

APPENDIX D
HISTORICAL SUMMARY OF VOC CONCENTRATIONS
CARPENTER - GENERAL TIME FACILITY
ATHENS, GEORGIA

Location Name	MW-11I										MW-11S									
Sample Date	Dec-07	5/29/2009	8/21/2009	3/23/2010	7/1/2010	9/29/2010	11/17/2010	12/20/2011	2/20/2012	9/18/2015	9/8/2016	Mar-00	Aug-02	Dec-07	5/29/2009	8/21/2009	3/23/2010	7/1/2010	9/29/2010	11/17/2010	12/20/2011	2/20/2012
Field Parameters																						
Conductivity, Field (mS/cm)	-	**0.093**	-	**0.076**	-	-	**0.082**	**0.08**	**0.08**	**0.108**	**0.096**	-	-	-	**0.052**	-	**0.068**	-	-	**0.085**	**0.035**	**0.053**
Dissolved Oxygen, Field (mg/L)	-	**13**	-	**2.48**	-	-	**1.98**	**2.42**	**1.7**	**3.1**	**0.96**	-	-	-	**16.2**	-	**0.53**	-	-	**1.06**	**0.76**	**0.72**
ORP, Field (mV)	-	**5.8**	-	**-137.6**	-	-	**146.3**	**154**	**136.4**	**220**	**246**	-	-	-	**29.4**	-	**-150**	-	-	**-181.1**	**187**	**80.5**
pH, Field (NTU)	-	**6.44**	-	**6.1**	-	-	**6.23**	**5.82**	**5.96**	**5.82**	**5.41**	-	-	-	**5.7**	-	**5.15**	-	-	**5.03**	**5.25**	**5.19**
Temperature, Field (Deg C)	-	**17.5**	-	**16.13**	-	-	**16.23**	**16**	**15.3**	**18.74**	**19.45**	-	-	-	**16.8**	-	**13.78**	-	-	**17.47**	**16.3**	**13.6**
Turbidity, Field (NTU)	-	-	-	**78**	-	-	**5.2**	**4.3**	**2.4**	**2.4**	**0**	-	-	-	-	-	**35.2**	-	-	**4.35**	**4.7**	**4.6**
General Chemistry (mg/L)																						
Alkalinity, Total (as CaCO3)	-	**39.6**	**33**	**39.7**	**38**	**45.1**	**40.1**	**37.9**	**39.2**	-	-	-	-	-	**7.9**	**9**	**9.8**	**10**	**12**	**7.5**	**6.5**	**9.5**
Carbon Dioxide	-	**110**	**89.2**	**126**	**146**	**134**	**82.5**	-	-	-	-	-	-	-	**84.8**	**92.1**	**127**	**83**	**130**	**70.6**	-	-
Chloride	-	**4**	**4.6**	**9.4**	**4.3**	-	-	-	-	-	-	-	-	-	**5.4**	**6.3**	**14.5**	**6.3**	-	-	-	-
Nitrate	-	**0.7**	**0.91**	**0.86**	**0.85**	**0.82**	**0.82**	**0.88**	**0.96**	-	-	-	-	-	< 0.1	**0.35**	**0.12**	**0.12**	**0.31**	**0.4**	**0.48**	< 0.2
Nitrite (as N)	-	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.1	< 0.1	-	-	-	-	-	< 0.1	< 0.1	< 0.10	< 0.10	< 0,10	< 0.10	< 0.1	< 0.1
Nitrite/Nitrate Nitrogen	-	**0.7**	**0.91**	**0.86**	**0.85**	**0.82**	**0.82**	**0.88**	**0.96**	-	-	-	-	-	< 0.1	**0.35**	< 0.20	< 0.20	**0.31**	**0.4**	**0.48**	< 0.2
Sulfate	-	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 5	-	-	-	-	-	< 2	**2**	**4.9**	**2.7**	**3**	**3.4**	< 5	**6.1**
Sulfide	-	< 1	< 1	< 1	**23.5**	**1**	< 1	< 0.1	< 0.1	-	-	-	-	-	< 1	< 1	< 1	< 1	**1**	**1**	< 0.1	< 0.1
Total Organic Carbon (TOC)	-	-	-	-	< 1	< 1	< 1	**1.8**	**1.8**	-	-	-	-	-	-	-	-	< 1	< 1	< 1	**2**	**2.9**
Dissolved Gases(ug/L)																						
Ethane	-	< 1	< 1	< 1	< 1	< 1	< 1	< 10	< 12.4	-	-	-	-	-	< 1	< 1	< 1	< 1	< 1	< 1	< 10	< 12.4
Ethene	-	< 1	< 1	< 1	< 1	< 1	< 1	< 10	< 12.4	-	-	-	-	-	< 1	< 1	< 1	< 1	< 1	< 1	< 10	< 12.4
Methane	-	< 0.5	**0.76**	**7.13**	**0.93**	**0.40 J**	**0.38 J**	< 10	< 6.6	-	-	-	-	-	6.2	0.65	**52.7**	**2.91**	**3.07**	**14.8**	< 10	< 6.6
Volatile Fatty Acids(mg/L)																						
Acetic Acid	-	-	-	-	-	-	-	< 0.070	**0.012 J**	-	-	-	-	-	-	-	-	-	-	-	< 0.070	**0.025 J**
Butyric Acid	-	-	-	-	-	-	-	< 0.050	< 0.050	-	-	-	-	-	-	-	-	-	-	-	< 0.050	< 0.050
Lactic Acid	-	-	-	-	-	-	-	< 0.10	**0.061 J**	-	-	-	-	-	-	-	-	-	-	-	< 0.10	**0.039 J**
Propionic Acid	-	-	-	-	-	-	-	< 0.050	**0.0089 J**	-	-	-	-	-	-	-	-	-	-	-	< 0.050	< 0.050
Pyruvic Acid	-	-	-	-	-	-	-	< 0.15	< 0.15	-	-	-	-	-	-	-	-	-	-	-	< 0.15	< 0.15
Dissolved Hydrogen (nM)																						
Hydrogen	-	-	-	-	-	-	-	**0.84**	**1.0**	-	-	-	-	-	-	-	-	-	-	-	**2.1**	**2.2**
Inorganic Compounds(ug/L)																						
Iron, Dissolved	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron, Ferrous	-	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	-	-	-	-	-	-	< 0.1	< 0,1	< 0.10	< 0.10	< 0.10	< 0.10	-	-
Manganese, Dissolved	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds (ug/L)																						
Acetone	-	< 250	-	< 130	< 250	< 250	< 250	< 25	-	-	-	-	-	-	< 25	-	< 25	< 25	< 130	< 130	< 25	-
Benzene	-	< 10	-	< 5	< 10	< 10	< 10	< 1	-	-	-	-	-	-	< 1	-	< 1	< 1	< 5	< 5	< 1	-
Bromobenzene	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-
Bromochloromethane	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-
Bromodichloromethane	-	< 10	-	< 5	< 10	< 10	< 10	< 1	-	-	-	-	-	-	< 1	-	< 1	< 1	< 5	< 5	< 1	-
Bromoform	-	< 10	-	< 5	< 10	< 10	< 10	< 1	-	-	-	-	-	-	< 1	-	< 1	< 1	< 5	< 5	< 1	-
Bromomethane	-	-	-	-	-	-	-	< 2	-	-	-	-	-	-	-	-	-	-	-	-	< 2	-
2-Butanone (MEK)	-	-	-	-	-	-	-	< 5	-	-	-	-	-	-	-	-	-	-	-	-	< 5	-
Carbon disulfide	-	< 20	-	< 10	< 20	< 20	< 20	-	-	-	-	-	-	-	< 2	-	< 2	< 2	< 10	< 10	-	-
Carbon tetrachloride	-	< 10	-	< 5	< 10	< 10	< 10	< 1	-	-	-	-	-	-	< 1	-	< 1	< 1	< 5	< 5	< 1	-
Chlorobenzene	-	< 10	-	< 5	< 10	< 10	< 10	< 1	-	-	-	-	-	-	< 1	-	< 1	< 1	< 5	< 5	< 1	-
Chloroethane	-	< 20	-	< 10	< 20	< 20	< 20	< 1	-	-	-	-	-	-	< 2	-	< 2	< 2	< 10	< 10	< 1	-
Chloroform	-	< 10	-	< 5	< 10	< 10	< 10	< 1	-	-	-	-	-	-	< 1	-	< 1	< 1	< 5	< 5	< 1	-
Chloromethane	< 5	-	-	-	-	-	-	< 1	-	-	-	< 50	< 20	< 5	-	-	-	-	-	-	< 1	-
2-Chlorotoluene	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-
4-Chlorotoluene	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-
1,2-Dibromo-3-chloropropane	-	-	-	-	-	-	-	< 5	-	-	-	-	-	-	-	-	-	-	-	-	< 5	-
Dibromochloromethane	-	< 10	-	< 5	< 10	< 10	< 10	< 1	-	-	-	-	-	-	< 1	-	< 1	< 1	< 5	< 5	< 1	-
1,2-Dibromoethane (EDB)	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-
Dibromomethane	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-
1,2-Dichlorobenzene	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-
1,3-Dichlorobenzene	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-
1,4-Dichlorobenzene	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-
Dichlorodifluoromethane	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-
1,1-Dichloroethane	< 5	< 10	-	< 5	< 10	< 10	< 10	< 1	-	< 1	< 1	< 25	< 10	< 5	< 1	-	< 1	< 1	< 5	< 5	< 1	-
1,2-Dichloroethane	-	< 10	-	< 5	< 10	< 10	< 10	< 1	-	-	-	-	-	-	< 1	-	< 1	< 1	< 5	< 5	< 1	-
1,1-Dichloroethene	< 5	< 10	-	< 5	< 10	< 10	< 10	< 1	-	-	< 1	< 25	< 10	< 5	< 1	-	< 1	< 1	< 5	< 5	< 1	-
cis-1,2-Dichloroethene	**88**	**44.6**	**42.4**	**43**	**36.9**	**38.2**	**41.6**	**50**	**33.4**	**44**	**44**	-	-	**44**	**7.6**	**15.4**	**6.8**	**3.4**	**18.3**	**21.2**	**26.7**	**50.9**
trans-1,2-Dichloroethene	< 5	< 10	-	< 5	< 10	< 10	< 10	< 1	< 5	< 1	< 1	-	-	< 5	< 1	-	< 1	< 1	< 5	< 5	< 1	< 1
1,2-Dichloropropane	-	< 10	-	< 5	< 10	< 10	< 10	< 1	-	-	-	-	-	-	< 1	-	< 1	< 1	< 5	< 5	< 1	-
1,3-Dichloropropane	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-
2,2-Dichloropropane	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-
1,1-Dichloropropene	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-
cis-1,3-Dichloropropene	-	< 10	-	< 5	< 10	< 10	< 10	< 1	-	-	-	-	-	-	< 1	-	< 1	< 1	< 5	< 5	< 1	-
trans-1,3-Dichloropropene	-	< 10	-	< 5	< 10	< 10	< 10	< 1	-	-	-	-	-	-	< 1	-	< 1	< 1	< 5	< 5	< 1	-
Diisopropyl ether	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-
Ethylbenzene	-	< 10	-	< 5	< 10	< 10	< 10	< 1	-	-	-	-	-	-	< 1	-	< 1	< 1	< 5	< 5	< 1	-
Hexachloro-1,3-butadiene	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-
2-Hexanone	-	< 100	-	< 50	< 100	< 100	< 100	< 5	-	-	-	-	-	-	< 10	-	< 10	< 10	< 50	< 50	< 5	-
p-Isopropyltoluene	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-
Methyl bromide	-	< 20	-	< 10	< 20	< 20	< 20	-	-	-	-	-	-	-	< 2	-	< 2	< 2	< 10	< 10	-	-
Methyl chloride	< 5	< 20	-	< 10	< 20	< 20	< 20	-	-	-	-	< 25	< 10	< 5	< 2	-	< 2	< 2	< 10	< 10	-	-
Methylene Chloride	-	**13.9**	-	< 25	< 20	< 20	< 20	< 2	-	< 4	< 4	-	-	-	< 5	-	< 5	< 5	< 25	< 25	< 2	-
Methyl ethyl ketone	-	< 50	-	< 25	< 50	< 50	< 50	-	-	-	-	-	-	-	< 5	-	< 5	< 5	< 25	< 25	-	-
4-Methyl-2-pentanone (MIBK)	-	< 50	-	< 25	< 50	< 50	< 50	< 5	-	-	-	-	-	-	< 5	-	< 5	< 5	< 25	< 25	< 5	-
Methyl-tert-butyl ether	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-
Naphthalene	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-
Styrene	-	< 10	-	< 5	< 10	< 10	< 10	< 1	-	-	-	-	-	-	< 1	-	< 1	< 1	< 5	< 5	< 1	-
1,1,1,2-Tetrachloroethane	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-
1,1,2,2-Tetrachloroethane	-	< 10	-	< 5	< 10	< 10	< 10	< 1	-	-	-	-	-	-	< 1	-	< 1	< 1	< 5	< 5	< 1	-
Tetrachloroethene	< 5	< 10	-	< 5	< 10	< 10	< 10	< 1	-	-	-	< 25	< 10	< 5	< 1	-	< 1	< 1	< 5	< 5	< 1	-
Toluene	-	< 10	-	< 5	< 10	< 10	< 10	< 1	-	-	-	-	-	-	< 1	-	< 1	< 1	< 5	< 5	< 1	-
1,2,3-Trichlorobenzene	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-
1,2,4-Trichlorobenzene	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-
1,1,1-Trichloroethane	< 5	< 10	-	< 5	< 10	< 10	< 10	< 1	-	-	-	< 25	< 10	< 5	< 1	-	< 1	< 1	< 5	< 5	< 1	-
1,1,2-Trichloroethane	< 5	< 10	-	< 5	< 10	< 10	< 10	< 1	-	< 1	< 1	< 25	< 10	< 5	< 1	-	< 1	< 1	< 5	< 5	< 1	-
Trichloroethene	**1900**	**1040**	**1060**	**747**	**872**	**798**	**804**	**766**	**540**	**490**	**510**	**690**	**300**	**860**	**40.3**	**401**	**64.2**	**52**	**369**	**389**	**356**	**183**
Trichlorofluoromethane	-	-	-	-	-	-	-	**1.4**	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-
1,2,3-Trichloropropane	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-
Vinyl acetate	-	-	-	-	-	-	-	< 2	-	-	-	-	-	-	-	-	-	-	-	-	< 2	-
Vinyl chloride	< 2	< 10	< 10	< 5	< 10	< 10	< 10	< 1	< 5	< 1	< 1	**12**	< 4	< 2	< 1	< 5	< 1	< 1	< 5	< 5	< 1	< 1
m&p-Xylene	-	-	-	-	-	-	-	< 2	-	-	-	-	-	-	-	-	-	-	-	-	< 2	-
o-Xylene	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-
Xylene, Total	-	< 30	-	< 15	< 30	< 30	< 30	-	-	-	-	-	-	-	< 3	-	< 3	< 3	< 15	< 15	-	-

Notes and Abbreviations:
1. Results shown in **bold** were detected.
2. < - Not detected above the laboratory detection limit.
3. Only detected compounds are shown in table.
4. - Not analyzed.
5. ND = Non Detect

APPENDIX D
HISTORICAL SUMMARY OF VOC CONCENTRATIONS
CARPENTER - GENERAL TIME FACILITY
ATHENS, GEORGIA

Location Name			MW-12I		MW-12D	MW-13I	MW-14D		MW-14I		MW-15I	MW-16D							
Sample Date	9/18/2015	9/8/2016	Mar-00	Mar-10	Mar-00	Mar-00	Mar-00	12/20/2011	Mar-00	12/20/2011	Mar-00	8/4/2011	11/19/2010	12/22/2011	2/22/2012	2/22/2012	9/16/2015	9/7/2016	11/19/2010	8/4/2011
Field Parameters																				
Conductivity, Field (mS/cm)	**0.161**	**0.056**	-	-	-	-	-	**0.105**	-	**0.06**	-	**0.126**	-	**0.088**	**0.105**	**0.105**	**0.112**	**0.103**	-	**0.703**
Dissolved Oxygen, Field (mg/L)	**3.67**	**0.24**	-	-	-	-	-	**3.1**	-	**1.48**	-	**1.79**	-	**3.51**	**1.97**	**1.97**	**2.55**	**1.59**	-	**0.51**
ORP, Field (mV)	**261**	**330**	-	-	-	-	-	**154.9**	-	**85.1**	-	**386.2**	-	**84**	**124.3**	**124.3**	**176**	**266**	-	**290.6**
pH, Field (NTU)	**4.56**	**4.26**	-	-	-	-	-	**6.28**	-	**6.13**	-	**5.85**	-	**5.85**	**5.99**	**5.99**	**6.37**	**5.28**	-	**5.24**
Temperature, Field (Deg C)	**19.83**	**23.84**	-	-	-	-	-	**16**	-	**15.4**	-	**21.6**	-	**19.9**	**18.9**	**18.9**	**20.73**	**26.78**	-	**21.3**
Turbidity, Field (NTU)	**37.5**	**20.6**	-	-	-	-	-	**0.9**	-	**5.7**	-	**5.85**	-	**3.1**	**2.3**	**2.3**	**4.7**	**0**	-	**34.1**
General Chemistry (mg/L)																				
Alkalinity, Total (as CaCO3)	-	-	-	-	-	-	-	**51.3**	-	**26**	-	-	-	**30.5**	-	-	-	-	-	-
Carbon Dioxide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate	-	-	-	-	-	-	-	< 0.2	-	< 0.2	-	**1.2**	-	**1.1**	**1.2**	**1.2**	-	-	-	**7.2**
Nitrite (as N)	-	-	-	-	-	-	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	< 0.1	< 0.1	-	-	-	**0.27**
Nitrite/Nitrate Nitrogen	-	-	-	-	-	-	-	< 0.2	-	< 0.2	-	**1.2**	-	**1.1**	**1.2**	**1.2**	-	-	-	**7.5**
Sulfate	-	-	-	-	-	-	-	< 5	-	< 5	-	**16.7**	-	**10.3**	-	-	-	-	-	**193**
Sulfide	-	-	-	-	-	-	-	< 0.1	-	< 0.1	-	-	-	< 0.1	< 0.1	< 0.1	-	-	-	-
Total Organic Carbon (TOC)	-	-	-	-	-	-	-	**1.5**	-	**1.5**	-	**12.8**	-	**2.2**	**1.8**	**1.9**	-	-	-	**3.5**
Dissolved Gases(ug/L)																				
Ethane	-	-	-	-	-	-	-	< 10	-	< 10	-	< 10	-	< 10	< 12.6		-	-	-	< 10
Ethene	-	-	-	-	-	-	-	< 10	-	< 10	-	< 10	-	< 10	< 12.6		-	-	-	< 10
Methane	-	-	-	-	-	-	-	< 10	-	**30**	-	< 10	-	< 10	< 6.6		-	-	-	46.8
Volatile Fatty Acids(mg/L)																				
Acetic Acid	-	-	-	-	-	-	-	< 0.070	-	< 0.070	-	-	-	< 0.070	**0.049 J**	**0.089**	-	-	-	-
Butyric Acid	-	-	-	-	-	-	-	< 0.050	-	< 0.050	-	-	-	< 0.050	**0.042 J**	**0.072**	-	-	-	-
Lactic Acid	-	-	-	-	-	-	-	**0.16**	-	**0.10**	-	-	-	< 0.10	**0.074 J**	**0.073 J**	-	-	-	-
Propionic Acid	-	-	-	-	-	-	-	< 0.050	-	< 0.050	-	-	-	< 0.050	**0.016 J**	**0.0089 J**	-	-	-	-
Pyruvic Acid	-	-	-	-	-	-	-	< 0.15	-	< 0.15	-	-	-	< 0.15	< 0.15	< 0.15	-	-	-	-
Dissolved Hydrogen (nM)																				
Hydrogen	-	-	-	-	-	-	-	**1.0**	-	**0.94**	-	-	-	**2.8**	**3.8**	**6.2**	-	-	-	-
Inorganic Compounds(ug/L)																				
Iron, Dissolved	-	-	-	-	-	-	-	-	-	-	-	< 50	-	-	-	-	-	-	-	< 50
Iron, Total	-	-	-	-	-	-	-	-	-	-	-	**80.5**	-	-	-	-	-	-	-	**1150**
Iron, Ferrous	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese, Dissolved	-	-	-	-	-	-	-	-	-	-	-	**20.3**	-	-	-	-	-	-	-	**1640**
Manganese, Total	-	-	-	-	-	-	-	-	-	-	-	**25.9**	-	-	-	-	-	-	-	**1820**
Volatile Organic Compounds (ug/L)																				
Acetone	-	-	-	-	-	-	-	< 25	-	< 25	-	-	-	< 25	-	-	-	-	-	-
Benzene	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
Bromobenzene	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
Bromochloromethane	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
Bromodichloromethane	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
Bromoform	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
Bromomethane	-	-	-	-	-	-	-	< 2	-	< 2	-	-	-	< 2	-	-	-	-	-	-
2-Butanone (MEK)	-	-	-	-	-	-	-	< 5	-	< 5	-	-	-	< 5	-	-	-	-	-	-
Carbon disulfide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
Chlorobenzene	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
Chloroethane	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
Chloroform	-	-	-	-	-	-	-	< 1	-	**1.5**	-	-	-	**1.1**	-	-	-	-	-	-
Chloromethane	-	-	< 5	< 2	< 10	< 10	< 10	< 1	< 10	< 1	< 10	-	-	< 1	-	-	-	-	-	-
2-Chlorotoluene	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
4-Chlorotoluene	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane	-	-	-	-	-	-	-	< 5	-	< 5	-	-	-	< 5	-	-	-	-	-	-
Dibromochloromethane	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
1,2-Dibromoethane (EDB)	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
Dibromomethane	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
1,2-Dichlorobenzene	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
1,3-Dichlorobenzene	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
1,4-Dichlorobenzene	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
Dichlorodifluoromethane	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
1,1-Dichloroethane	< 1	< 1	< 5	< 1	< 5	< 5	< 5	< 1	< 5	< 1	< 5	-	-	< 1	-	-	< 1	< 1	-	-
1,2-Dichloroethane	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
1,1-Dichloroethene	-	< 1	< 5	< 1	< 5	< 5	< 5	< 1	< 5	< 1	< 5	-	-	< 1	-	-	-	< 1	-	-
cis-1,2-Dichloroethene	**30**	**29**	-	< 1	-	-	-	< 1	-	< 1	-	-	**27.3**	**52.9**	**34.2**	**28.2**	**28.8**	**36**	**43**	**7480**	**8220**
trans-1,2-Dichloroethene	< 1	< 1	-	< 1	-	-	-	< 1	-	< 1	-	< 1	-	< 1	< 1	< 1	< 1	< 1	-	24.1
1,2-Dichloropropane	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
1,3-Dichloropropane	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
2,2-Dichloropropane	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
1,1-Dichloropropene	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
cis-1,3-Dichloropropene	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
trans-1,3-Dichloropropene	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
Diisopropyl ether	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
Ethylbenzene	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
Hexachloro-1,3-butadiene	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
2-Hexanone	-	-	-	-	-	-	-	< 5	-	< 5	-	-	-	< 5	-	-	-	-	-	-
p-Isopropyltoluene	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
Methyl bromide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl chloride	-	-	< 5	< 2	< 5	< 5	< 5	-	< 5	-	< 5	-	-	-	-	-	-	-	-	-
Methylene Chloride	< 4	< 4	-	-	-	-	-	< 2	-	< 2	-	-	-	< 2	-	-	< 4	< 4	-	-
Methyl ethyl ketone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone (MIBK)	-	-	-	-	-	-	-	< 5	-	< 5	-	-	-	< 5	-	-	-	-	-	-
Methyl-tert-butyl ether	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
Naphthalene	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
Styrene	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
1,1,1,2-Tetrachloroethane	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
Tetrachloroethene	-	-	< 5	< 1	< 5	< 5	< 5	< 1	< 5	< 1	< 5	<1	-	< 1	-	-	-	-	-	**2.3**
Toluene	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
1,2,3-Trichlorobenzene	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
1,2,4-Trichlorobenzene	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
1,1,1-Trichloroethane	-	-	< 5	< 1	< 5	< 5	< 5	< 1	< 5	< 1	< 5	-	-	< 1	-	-	-	-	-	-
1,1,2-Trichloroethane	< 1	< 1	< 5	< 1	< 5	< 5	< 5	< 1	< 5	< 1	< 5	-	-	< 1	-	-	< 1	< 1	-	-
Trichloroethene	**260**	**280**	< 5	< 1	< 5	< 5	< 5	< 1	< 5	< 1	< 5	**90.6**	**184**	**114**	**90.4**	**95.9**	**110**	**110**	**24600**	**19700**
Trichlorofluoromethane	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
1,2,3-Trichloropropane	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
Vinyl acetate	-	-	-	-	-	-	-	< 2	-	< 2	-	-	-	< 2	-	-	-	-	-	-
Vinyl chloride	< 1	< 1	< 2	< 1	< 2	< 2	< 2	< 1	< 2	< 1	< 2	< 1	**0.98 J**	< 1	< 1	< 1	< 1	< 1	**174 J**	**178**
m&p-Xylene	-	-	-	-	-	-	-	< 2	-	< 2	-	-	-	< 2	-	-	-	-	-	-
o-Xylene	-	-	-	-	-	-	-	< 1	-	< 1	-	-	-	< 1	-	-	-	-	-	-
Xylene, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes and Abbreviations:
1. Results shown in **bold** were detected.
2. < - Not detected above the laboratory detection limit.
3. Only detected compounds are shown in table.
4. - Not analyzed.
5. ND = Non Detect

APPENDIX D
HISTORICAL SUMMARY OF VOC CONCENTRATIONS
CARPENTER - GENERAL TIME FACILITY
ATHENS, GEORGIA

Location Name	MW-16I								RW-1												
Sample Date	12/22/2011	2/22/2012	11/12/2014	1/6/2015	2/23/2015	4/30/2015	9/16/2015	9/7/2016	Apr-00	Aug-02	Dec-07	5/27/2009	8/19/2009	11/9/2009	3/22/2010	6/29/2010	10/1/2010	11/19/2010	8/2/2011	12/19/2011	2/21/2012	5/27/2009
Field Parameters																						
Conductivity, Field (mS/cm)	**0.498**	**0.649**	-	-	-	-	**0.626**	**5.19**	-	-	-	**0.156**	-	**0.141**	**0.201**	-	-	**0.141**	**0.079**	**0.04**	**0.15**	**0.079**
Dissolved Oxygen, Field (mg/L)	**1.68**	**1.12**	-	-	-	-	**1.38**	**0.6**	-	-	-	**3.34**	-	**0.1**	**3.2**	-	-	**0.1**	**0.83**	**0.38**	**0.2**	**2.85**
ORP, Field (mV)	**125.4**	**162.4**	-	-	-	-	**-21**	**-118**	-	-	-	**16.9**	-	**73**	**-161.9**	-	-	**73**	**162.1**	**162.8**	**3.8**	**31.7**
pH, Field (NTU)	**5.32**	**5.42**	-	-	-	-	**6.31**	**6.15**	-	-	-	**6.19**	-	**5.75**	**6.68**	-	-	**5.75**	**5.81**	**5.31**	**5.95**	**5.89**
Temperature, Field (Deg C)	**20.2**	**19.3**	-	-	-	-	**21.33**	**23.84**	-	-	-	**19.78**	-	**20.55**	**16.5**	-	-	**20.55**	**28.1**	**19.8**	**19.2**	**20.64**
Turbidity, Field (NTU)	**5.2**	**1.9**	-	-	-	-	**8.7**	**41.3**	-	-	-	**-**	-	**1.23**	**3.67**	-	-	**1.23**	**4.8**	**-0.2**	**2.1**	**-**
General Chemistry (mg/L)																						
Alkalinity, Total (as CaCO3)	**25.2**	-	-	-	-	-	-	-	-	-	-	**70.6**	-	-	-	-	-	-	-	-	-	33
Carbon Dioxide	**-**	**-**	-	**-**	-	**-**	**-**	**-**	**-**	**-**	**-**	**164**	-	**-**	**-**	-	-	**-**	**-**	**-**	**-**	**101**
Chloride	**-**	**-**	-	**-**	-	**-**	**-**	**-**	**-**	**-**	**-**	**4.1**	-	**-**	**-**	-	-	**-**	**-**	**-**	**-**	**3.6**
Nitrate	**5.9**	**5.8**	-	< 0.10	< 0.10	**0.66**	**-**	-	-	-	-	**0.31**	-	-	-	-	-	-	**0.21**	-	-	0.76
Nitrite (as N)	**0.24**	**0.18**	-	< 0.050	< 0.050	< 0.050	**-**	-	-	-	-	< 0,10	-	-	-	-	-	-	< 0.1	-	-	< 0.1
Nitrite/Nitrate Nitrogen	**6.2**	**6**	-	**-**	-	**-**	**-**	-	-	-	-	**0.31**	-	-	-	-	-	-	**0.21**	-	-	0.76
Sulfate	**166**	-	**186**	**128**	**111**	**156**	-	-	-	-	-	< 2	-	-	-	-	-	-	< 5	-	-	< 2
Sulfide	< 0.1	< 0.1	-	-	-	-	-	-	-	-	-	< 1	-	-	-	-	-	-	-	-	-	< 1
Total Organic Carbon (TOC)	**11.3**	**12**	**5.9**	**5380**	**292**	**14.3**	**-**	-	-	-	-	-	-	-	-	-	-	-	**3.5**	-	-	-
Dissolved Gases(ug/L)																						
Ethane	< 10	< 12.6	-	-	-	-	-	-	-	-	-	**1.84**	-	-	-	-	-	-	< 10	-	-	< 1
Ethene	< 10	< 12.6	-	-	-	-	-	-	-	-	-	**1.48**	-	-	-	-	-	-	**232**	-	-	< 1
Methane	**27.7**	**35.8**	**-**	**-**	**-**	**-**	**-**	-	-	-	-	**1640**	-	-	-	-	-	-	< 10	-	-	**8.05**
Volatile Fatty Acids(mg/L)																						
Acetic Acid	< 0.070	**0.28**	**-**	**-**	**-**	**-**	**-**	-	-	-	-	-	-	-	-	-	-	-	**-**	-	-	-
Butyric Acid	< 0.050	**0.17**	**-**	**-**	**-**	**-**	**-**	-	-	-	-	-	-	-	-	-	-	-	**-**	-	-	-
Lactic Acid	< 0.10	**0.30**	**-**	**-**	**-**	**-**	**-**	-	-	-	-	-	-	-	-	-	-	-	**-**	-	-	-
Propionic Acid	< 0.050	**0.023 J**	**-**	**-**	**-**	**-**	**-**	-	-	-	-	-	-	-	-	-	-	-	**-**	-	-	-
Pyruvic Acid	< 0.15	< 0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	-	-	-
Dissolved Hydrogen (nM)																						
Hydrogen	**4.7**	**6.4**	**-**	**-**	**-**	**-**	**-**	-	-	-	-	-	-	-	-	-	-	-	**-**	-	-	-
Inorganic Compounds(ug/L)																						
Iron, Dissolved	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	-	-	-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	< 50	**-**	**-**	**-**
Iron, Total	**-**	**-**	< 0.200	**5.38**	**6.10**	**5.87**	**-**	**-**	-	-	-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**671**	**-**	**-**	**-**
Iron, Ferrous	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**10.3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	< 0.10
Manganese, Dissolved	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	-	-	-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1220**	**-**	**-**	**-**
Manganese, Total	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	-	-	-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1440**	**-**	**-**	**-**
Volatile Organic Compounds (ug/L)																						
Acetone	< 25	-	< 200	**12000**	**2300**	**540**	-	-	-	-	-	< 25	-	< 130	< 130	< 130	< 130	-	-	< 25	-	< 25
Benzene	< 1	-	< 10	< 10	<5	< 10	-	-	-	-	-	< 1	-	< 5	< 5	< 5	< 5	-	-	< 1	-	< 1
Bromobenzene	< 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-
Bromochloromethane	< 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-
Bromodichloromethane	< 1	-	< 10	< 10	< 5	< 10	-	-	-	-	-	< 1	-	< 5	< 5	< 5	< 5	-	-	< 1	-	< 1
Bromoform	< 1	-	< 40	< 40	< 20	< 40	-	-	-	-	-	< 1	-	< 5	< 5	< 5	< 5	-	-	< 1	-	< 1
Bromomethane	< 2	-	< 10	< 10	< 5	< 10	-	-	-	-	-	-	-	-	-	-	-	-	-	< 2	-	-
2-Butanone (MEK)	< 5	-	< 100	< 100	< 50	< 100	-	-	-	-	-	-	-	-	-	-	-	-	-	< 5	-	-
Carbon disulfide	-	-	-	-	-	-	-	-	-	-	-	<2	-	< 10	< 10	< 10	< 10	-	-	-	-	<2
Carbon tetrachloride	< 1	-	< 10	< 10	< 5	< 10	-	-	-	-	-	< 1	-	< 5	< 5	< 5	< 5	-	-	< 1	-	< 1
Chlorobenzene	< 1	-	< 10	< 10	< 5	< 10	-	-	-	-	-	< 1	-	< 5	< 5	< 5	< 5	-	-	< 1	-	< 1
Chloroethane	< 1	-	< 10	< 10	< 5	< 10	-	-	-	-	-	< 2	-	< 10	< 10	< 10	< 10	-	-	< 1	-	< 2
Chloroform	**3.1**	-	< 10	**11**	< 5	< 10	-	-	-	-	-	**1.4**	-	< 5	< 5	< 5	**1.4 J**	-	-	**1.5**	-	**3.2**
Chloromethane	< 1	-	< 10	< 10	< 5	< 10	-	-	< 200	< 50	< 5	-	-	-	-	-	-	-	-	< 1	-	-
2-Chlorotoluene	< 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-
4-Chlorotoluene	< 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-
1,2-Dibromo-3-chloropropane	< 5	-	< 50	< 50	< 25	< 50	-	-	-	-	-	-	-	-	-	-	-	-	-	< 5	-	-
Dibromochloromethane	< 1	-	< 10	< 10	< 5	< 10	-	-	-	-	-	< 1	-	< 5	< 5	< 5	< 5	-	-	< 1	-	< 1
1,2-Dibromoethane (EDB)	< 1	-	< 10	< 10	< 5	< 10	-	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-
Dibromomethane	< 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-
1,2-Dichlorobenzene	< 1	-	< 50	< 50	< 25	< 50	-	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-
1,3-Dichlorobenzene	< 1	-	< 50	< 50	< 25	< 50	-	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-
1,4-Dichlorobenzene	< 1	-	<50	<50	< 25	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-
Dichlorodifluoromethane	< 1	-	< 10	< 10	< 5	< 10	-	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-
1,1-Dichloroethane	**3.2**	-	< 10	< 10	< 5	< 10	< 20	< 1	< 200	< 50	< 5	< 1	-	< 5	< 5	< 5	< 5	-	-	< 1	-	< 1
1,2-Dichloroethane	< 1	-	< 10	< 10	< 5	< 10	-	-	-	-	-	< 1	-	< 5	< 5	< 5	< 5	-	-	< 1	-	< 1
1,1-Dichloroethene	**12.2**	-	**11**	< 10	**12**	**16**	-	-	< 200	< 50	< 5	< 1	-	< 5	< 5	< 5	**3.4 J**	-	-	< 1	-	< 1
cis-1,2-Dichloroethene	**7360**	**10600**	**6000**	**3400**	**6400**	**9400**	**15000**	**22000**	**-**	-	**90**	**19.1**	**157**	**19.1**	**503**	**291**	**824**	**2.5**	**198**	**404**	**784**	**2.8**
trans-1,2-Dichloroethene	**126**	< 100	**20**	**20**	**24**	**26**	**48**	**250**	**-**	-	< 5	< 1	-	< 5	< 5	< 5	< 5	-	< 1	< 1	< 5	< 1
1,2-Dichloropropane	< 1	-	< 10	< 10	< 5	< 10	-	-	-	-	-	< 1	-	< 5	< 5	< 5	< 5	-	-	< 1	-	< 1
1,3-Dichloropropane	< 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-
2,2-Dichloropropane	< 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-
1,1-Dichloropropene	< 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-
cis-1,3-Dichloropropene	< 1	-	< 10	< 10	< 5	< 10	-	-	-	-	-	< 1	-	< 5	< 5	< 5	< 5	-	-	< 1	-	< 1
trans-1,3-Dichloropropene	< 1	-	< 10	< 10	< 5	< 10	-	-	-	-	-	< 1	-	< 5	< 5	< 5	< 5	-	-	< 1	-	< 1
Diisopropyl ether	< 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-
Ethylbenzene	< 1	-	< 10	< 10	< 5	< 10	-	-	-	-	-	< 1	-	< 5	< 5	< 5	< 5	-	-	< 1	-	< 1
Hexachloro-1,3-butadiene	< 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-
2-Hexanone	< 5	-	< 100	< 100	< 50	< 100	-	-	-	-	-	< 10	-	< 50	< 50	< 50	< 50	-	-	< 5	-	< 10
p-Isopropyltoluene	< 1	-	< 50	< 50	< 25	< 50	-	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-
Methyl bromide	-	-	-	-	-	-	-	-	-	-	-	< 2	-	< 10	< 10	< 10	< 10	-	-	-	-	< 2
Methyl chloride	-	-	-	-	-	-	-	-	< 200	< 50	< 5	< 2	-	< 10	< 10	< 10	< 10	-	-	-	-	< 2
Methylene Chloride	**5.2**	-	< 40	< 40	< 20	< 40	< 80	< 4	-	-	-	**3.2**	-	< 25	< 25	< 25	< 25	-	-	< 2	-	**3.5**
Methyl ethyl ketone	-	-	-	-	-	-	-	-	-	-	-	< 5	-	< 25	< 25	< 25	< 25	-	-	-	-	< 5
4-Methyl-2-pentanone (MIBK)	< 5	-	< 100	< 100	< 50	< 100	-	-	-	-	-	< 5	-	< 25	< 25	< 25	< 25	-	-	< 5	-	< 5
Methyl-tert-butyl ether	< 1	-	< 10	< 10	< 5	< 10	-	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-
Naphthalene	**5.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-
Styrene	< 1	-	< 50	< 50	< 25	< 50	-	-	-	-	-	< 1	-	< 5	< 5	< 5	< 5	-	-	< 1	-	< 1
1,1,1,2-Tetrachloroethane	< 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-
1,1,2,2-Tetrachloroethane	< 1	-	<10	<10	< 5	<10	-	-	-	-	-	< 1	-	< 5	< 5	< 5	< 5	-	-	< 1	-	< 1
Tetrachloroethene	**1.7**	-	< 10	< 10	< 5	< 10	-	-	< 200	< 50	< 5	< 1	-	< 5	< 5	< 5	< 5	-	< 1	< 1	-	< 1
Toluene	**1.2**	-	< 10	< 10	< 5	< 10	-	-	-	-	-	< 1	-	< 5	**1.4 J**	< 5	< 5	-	-	< 1	-	< 1
1,2,3-Trichlorobenzene	< 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-
1,2,4-Trichlorobenzene	< 1	-	< 50	< 50	< 25	< 50	-	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-
1,1,1-Trichloroethane	< 1	-	< 10	< 10	< 5	< 10	-	-	< 200	< 50	< 5	< 1	-	< 5	< 5	< 5	< 5	-	-	< 1	-	< 1
1,1,2-Trichloroethane	**9.1**	-	<10	<10	< 5	<10	< 20	< 1	< 200	< 50	< 5	< 1	-	< 5	< 5	< 5	< 5	-	-	< 1	-	< 1
Trichloroethene	**17800**	**19700**	**12000**	**10000**	**12000**	**18000**	**13000**	**97**	**1500**	**930**	**810**	**98.3**	**341**	**261**	**10.3**	**30.6**	**1550**	**643**	**188**	**987**	**2390**	**52.7**
Trichlorofluoromethane	< 1	-	< 10	< 10	< 5	< 10	-	-	-	-	-	-	-	-	-	-	-	-	-	**3.3**	-	-
1,2,3-Trichloropropane	< 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-
Vinyl acetate	< 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 2	-	-
Vinyl chloride	**109**	**164**	<120	**86**	**180**	**280**	**570**	**110**	**620**	**37**	< 2	**1.3**	**18.3**	**22.9**	**144**	**85**	**72.5**	**51**	**36.9**	**9.6**	**35.3**	< 1
m&p-Xylene	**3.6**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 2	-	-
o-Xylene	**8.3**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 1	-	-
Xylene, Total	-	-	-	-	-	-	-	-	-	-	-	< 3	-	< 15	< 15	< 15	< 15	-	-	-	-	< 3

Notes and Abbreviations:
1. Results shown in **bold** were detected.
2. < - Not detected above the laboratory detection limit.
3. Only detected compounds are shown in table.
4. - Not analyzed.
5. ND = Non Detect

APPENDIX D
HISTORICAL SUMMARY OF VOC CONCENTRATIONS
CARPENTER - GENERAL TIME FACILITY
ATHENS, GEORGIA

Location Name	RW-2									RW-3						RW-4					SW-1				
Sample Date	8/19/2009	11/9/2009	3/22/2010	6/29/2010	10/1/2010	11/19/2010	8/2/2011	12/19/2011	2/22/2012	11/12/2009	8/2/2011	12/19/2011	2/22/2012	9/16/2015	9/8/2016	8/3/2011	12/19/2011	2/22/2012	9/16/2015	9/8/2016	9/23/2013	10/13/2014	6/23/2015	9/18/2015	9/23/2013
Field Parameters																									
Conductivity, Field (mS/cm)	-	**0.07**	**0.068**	-	-	**0.07**	**0.084**	**0.07**	**0.72**	-	**0.471**	**0.131**	**0.146**	**0.282**	**0.205**	**0.14**	**0.08**	**0.087**	**0.111**	**0.094**	-	-	-	**0.106**	-
Dissolved Oxygen, Field (mg/L)	-	**0.1**	**3.8**	-	-	**0.1**	**2.4**	**3.83**	**2.45**	-	**1.03**	**0.43**	**0.64**	**1.43**	**0.53**	**1.68**	**2.99**	**2.6**	**3.6**	**3.52**	-	-	-	**6.50**	-
ORP, Field (mV)	-	**200.2**	**-103**	-	-	**200.2**	**609**	**152.9**	**108.4**	-	**-91.7**	**102.2**	**67.6**	**30**	**84**	**26.5**	**144.2**	**109.5**	**193**	**125**	-	-	-	**-44**	-
pH, Field (NTU)	-	**5.94**	**6.03**	-	-	**5.94**	**3.38**	**6.13**	**6.15**	-	**11.1**	**8.95**	**9.5**	**7.95**	**6.54**	**7.14**	**6.54**	**6.66**	**7.09**	**6.26**	-	-	-	**7.44**	-
Temperature, Field (Deg C)	-	**17.74**	**18.94**	-	-	**17.74**	**23.9**	**19.6**	**18.2**	-	**25.4**	**19.8**	**17.9**	**21.68**	**23.73**	**21.5**	**19.8**	**17.2**	**20.52**	**22.73**	-	-	-	**18.66**	-
Turbidity, Field (NTU)	-	**0.21**	**2.5**	-	-	**0.21**	**0.2**	**11.5**	**1.5**	-	**1.9**	**5.1**	**4**	**0.5**	**57.2**	**22.8**	**5.8**	**4.6**	**3.7**	**243**	-	-	-	**7.5**	-
General Chemistry (mg/L)																									
Alkalinity, Total (as CaCO3)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Dioxide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate	-	-	-	-	-	-	**0.76**	-	-	-	< 0.2	-	-	-	-	< 0.2	-	-	-	-	-	-	-	-	-
Nitrite (as N)	-	-	-	-	-	-	< 0.1	-	-	-	< 0.1	-	-	-	-	< 0.1	-	-	-	-	-	-	-	-	-
Nitrite/Nitrate Nitrogen	-	-	-	-	-	-	**0.76**	-	-	-	< 0.2	-	-	-	-	< 0.2	-	-	-	-	-	-	-	-	-
Sulfate	-	-	-	-	-	-	< 5.0	-	-	-	**31.6**	-	-	-	-	**10.9**	-	-	-	-	-	-	-	-	-
Sulfide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon (TOC)	-	-	-	-	-	-	**1.6**	-	-	-	4.2	-	-	-	-	2.5	-	-	-	-	-	-	-	-	-
Dissolved Gases(ug/L)																									
Ethane	-	-	-	-	-	-	< 10	-	-	-	< 10	-	-	-	-	< 10	-	-	-	-	-	-	-	-	-
Ethene	-	-	-	-	-	-	< 10	-	-	-	< 10	-	-	-	-	< 10	-	-	-	-	-	-	-	-	-
Methane	-	-	-	-	-	-	< 10	-	-	-	< 10	-	-	-	-	< 10	-	-	-	-	-	-	-	-	-
Volatile Fatty Acids(mg/L)																									
Acetic Acid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butyric Acid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lactic Acid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Propionic Acid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyruvic Acid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Hydrogen (nM)																									
Hydrogen	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Inorganic Compounds(ug/L)																									
Iron, Dissolved	-	-	-	-	-	-	< 50	-	-	-	< 50	-	-	-	-	< 50	-	-	-	-	-	-	-	-	-
Iron, Total	-	-	-	-	-	-	< 50	-	-	-	< 50	-	-	-	-	**980**	-	-	-	-	-	-	-	-	-
Iron, Ferrous	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese, Dissolved	-	-	-	-	-	-	< 5	-	-	-	< 5	-	-	-	-	**99.6**	-	-	-	-	-	-	-	-	-
Manganese, Total	-	-	-	-	-	-	< 5	-	-	-	< 5	-	-	-	-	**141**	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds (ug/L)																									
Acetone	-	< 25	< 25	< 25	< 25	-	-	< 25	-	< 25	-	< 25	-	-	-	-	< 25	-	-	-	-	-	-	-	-
Benzene	-	< 1	< 1	< 1	< 1	-	-	< 1	-	< 1	-	**3.0**	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Bromobenzene	-	-	-	-	-	-	-	< 1	-	-	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Bromochloromethane	-	-	-	-	-	-	-	< 1	-	-	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Bromodichloromethane	-	< 1	< 1	< 1	< 1	-	-	< 1	-	< 1	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Bromoform	-	< 1	< 1	< 1	< 1	-	-	< 1	-	< 1	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Bromomethane	-	-	-	-	-	-	-	< 2	-	-	-	< 2	-	-	-	-	< 2	-	-	-	-	-	-	-	-
2-Butanone (MEK)	-	-	-	-	-	-	-	< 5	-	-	-	< 5	-	-	-	-	< 5	-	-	-	-	-	-	-	-
Carbon disulfide	-	<2	<2	<2	<2	-	-	-	-	< 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	-	< 1	< 1	< 1	< 1	-	-	< 1	-	< 1	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Chlorobenzene	-	< 1	< 1	< 1	< 1	-	-	< 1	-	< 1	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Chloroethane	-	< 2	< 2	< 2	< 2	-	-	< 1	-	< 2	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Chloroform	-	**2.6**	**2.6**	**2**	**2.6**	-	-	**1.9**	-	< 1	-	**4.6**	-	-	-	-	**2.1**	-	-	-	-	-	-	-	-
Chloromethane	-	-	-	-	-	-	-	< 1	-	-	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
2-Chlorotoluene	-	-	-	-	-	-	-	< 1	-	-	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
4-Chlorotoluene	-	-	-	-	-	-	-	< 1	-	-	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane	-	-	-	-	-	-	-	< 5	-	-	-	< 5	-	-	-	-	< 5	-	-	-	-	-	-	-	-
Dibromochloromethane	-	< 1	< 1	< 1	< 1	-	-	< 1	-	< 1	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,2-Dibromoethane (EDB)	-	-	-	-	-	-	-	< 1	-	-	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Dibromomethane	-	-	-	-	-	-	-	< 1	-	-	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	-	-	-	-	-	-	-	< 1	-	-	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	-	-	-	-	-	-	-	< 1	-	-	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	-	-	-	-	-	-	-	< 1	-	-	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	-	-	-	-	-	-	-	< 1	-	-	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,1-Dichloroethane	-	< 1	< 1	< 1	< 1	-	-	< 1	-	< 1	-	**6.5**	-	< 20	< 20	-	< 1	-	< 1	< 1	< 1	< 5	< 1	< 1	< 1
1,2-Dichloroethane	-	< 1	< 1	< 1	< 1	-	-	< 1	-	< 1	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,1-Dichloroethene	-	< 1	< 1	< 1	< 1	-	-	< 1	-	< 1	-	**50.5**	-	-	**39**	-	< 1	-	-	< 1	-	-	-	-	-
cis-1,2-Dichloroethene	**1.9**	**2**	**2.8**	**2**	**2.5**	**373**	**2.7**	**3**	**2.6**	**0.43 J**	**92.8**	**678**	**768**	**770**	**900**	< 1	< 1	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1
trans-1,2-Dichloroethene	-	< 1	< 1	< 1	< 1	-	< 1	< 1	< 1	< 1	**6.5**	**29.2**	< 100	**33**	**51**	< 1	< 1	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1
1,2-Dichloropropane	-	< 1	< 1	< 1	< 1	-	-	< 1	-	< 1	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,3-Dichloropropane	-	-	-	-	-	-	-	< 1	-	-	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
2,2-Dichloropropane	-	-	-	-	-	-	-	< 1	-	-	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,1-Dichloropropene	-	-	-	-	-	-	-	< 1	-	-	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	-	< 1	< 1	< 1	< 1	-	-	< 1	-	< 1	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	-	< 1	< 1	< 1	< 1	-	-	< 1	-	< 1	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Diisopropyl ether	-	-	-	-	-	-	-	< 1	-	-	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Ethylbenzene	-	< 1	< 1	< 1	< 1	-	-	< 1	-	< 1	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Hexachloro-1,3-butadiene	-	-	-	-	-	-	-	< 1	-	-	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
2-Hexanone	-	< 10	< 10	< 10	< 10	-	-	< 5	-	< 10	-	< 5	-	-	-	-	< 5	-	-	-	-	-	-	-	-
p-Isopropyltoluene	-	-	-	-	-	-	-	< 1	-	-	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Methyl bromide	-	< 2	< 2	< 2	< 2	-	-	-	-	< 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl chloride	-	< 2	< 2	< 2	< 2	-	-	-	-	< 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene Chloride	-	< 2	< 2	< 2	< 2	-	-	< 2	-	< 2	-	**23.6**	-	< 80	< 80	-	< 2	-	< 4	< 4	< 5	< 5	< 4	< 4	< 5
Methyl ethyl ketone	-	< 5	< 5	< 5	< 5	-	-	-	-	< 5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone (MIBK)	-	< 5	< 5	< 5	< 5	-	-	< 5	-	< 5	-	< 5	-	-	-	-	< 5	-	-	-	-	-	-	-	-
Methyl-tert-butyl ether	-	-	-	-	-	-	-	< 1	-	-	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Naphthalene	-	-	-	-	-	-	-	< 1	-	-	-	**1.1**	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Styrene	-	< 1	< 1	< 1	< 1	-	-	< 1	-	< 1	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,1,1,2-Tetrachloroethane	-	-	-	-	-	-	-	< 1	-	-	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	-	< 1	< 1	< 1	< 1	-	-	< 1	-	< 1	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Tetrachloroethene	-	< 1	< 1	< 1	< 1	-	< 1	< 1	-	< 1	< 2	< 1	-	-	-	< 1	< 1	-	-	-	-	-	-	-	-
Toluene	-	< 1	< 1	**0.26 J**	**0.21 J**	-	-	< 1	-	< 1	-	**2.8**	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	-	-	-	-	-	-	-	< 1	-	-	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	-	-	-	-	-	-	-	< 1	-	-	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	-	< 1	< 1	< 1	< 1	-	-	< 1	-	< 1	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	-	< 1	< 1	< 1	< 1	-	-	< 1	-	< 1	-	**4.5**	-	< 20	< 20	-	< 1	-	< 1	< 1	< 1	< 5	< 1	< 1	< 1
Trichloroethene	**33.6**	**37.4**	**47.9**	**29.8**	**39.9**	**643**	**36**	**39.8**	**38.9**	**24.9**	**655**	**13100**	**16300**	**13000**	**13000**	< 1	**11.8**	**7.6**	**8**	**5**	< 1	< 5	< 1	< 1	< 1
Trichlorofluoromethane	-	-	-	-	-	-	-	< 1	-	-	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
1,2,3-Trichloropropane	-	-	-	-	-	-	-	< 1	-	-	-	< 1	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Vinyl acetate	-	-	-	-	-	-	-	< 2	-	-	-	< 2	-	-	-	-	< 2	-	-	-	-	-	-	-	-
Vinyl chloride	< 1	< 1	< 1	< 1	< 1	**51.5**	< 1	< 1	< 1	< 1	< 2	**2.1**	< 100	< 20	< 20	< 1	< 1	< 1	< 1	< 1	< 1	< 2	< 1	< 1	< 1
m&p-Xylene	-	-	-	-	-	-	-	< 2	-	-	-	< 2	-	-	-	-	< 2	-	-	-	-	-	-	-	-
o-Xylene	-	-	-	-	-	-	-	< 1	-	-	-	**5.0**	-	-	-	-	< 1	-	-	-	-	-	-	-	-
Xylene, Total	-	< 3	< 3	< 3	< 3	-	-	-	-	< 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes and Abbreviations:
1. Results shown in **bold** were detected.
2. < - Not detected above the laboratory detection limit.
3. Only detected compounds are shown in table.
4. - Not analyzed.
5. ND = Non Detect

APPENDIX D
HISTORICAL SUMMARY OF VOC CONCENTRATIONS
CARPENTER - GENERAL TIME FACILITY
ATHENS, GEORGIA

Location Name	SW-2			S-2		S-5	
Sample Date	10/13/2014	6/23/2015	9/18/2015	11/12/2009	12/27/2011	11/12/2009	12/27/2011
Field Parameters							
Conductivity, Field (mS/cm)	**-**	**-**	**0.105**	-	-	-	-
Dissolved Oxygen, Field (mg/L)	**-**	**-**	**6.86**	-	-	-	-
ORP, Field (mV)	**-**	**-**	**58**	-	-	-	-
pH, Field (NTU)	**-**	**-**	**7.49**	-	-	-	-
Temperature, Field (Deg C)	**-**	**-**	**19.92**	-	-	-	-
Turbidity, Field (NTU)	**-**	**-**	**19.1**	-	-	-	-
General Chemistry (mg/L)							
Alkalinity, Total (as CaCO3)	-	-	-	-	-	-	-
Carbon Dioxide	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Chloride	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Nitrate	-	-	-	-	-	-	-
Nitrite (as N)	-	-	-	-	-	-	-
Nitrite/Nitrate Nitrogen	-	-	-	-	-	-	-
Sulfate	-	-	-	-	-	-	-
Sulfide	-	-	-	-	-	-	-
Total Organic Carbon (TOC)	-	-	-	-	-	-	-
Dissolved Gases(ug/L)							
Ethane	-	-	-	-	-	-	-
Ethene	-	-	-	-	-	-	-
Methane	-	-	-	-	-	-	-
Volatile Fatty Acids(mg/L)							
Acetic Acid	-	-	-	-	-	-	-
Butyric Acid	-	-	-	-	-	-	-
Lactic Acid	-	-	-	-	-	-	-
Propionic Acid	-	-	-	-	-	-	-
Pyruvic Acid	-	-	-	-	-	-	-
Dissolved Hydrogen (nM)							
Hydrogen	-	-	-	-	-	-	-
Inorganic Compounds(ug/L)							
Iron, Dissolved	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iron, Total	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iron, Ferrous	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Manganese, Dissolved	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Manganese, Total	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Volatile Organic Compounds (ug/L)							
Acetone	-	-	-	< 25	< 25	< 25	< 25
Benzene	-	-	-	< 1	< 1	< 1	< 1
Bromobenzene	-	-	-	-	< 1	-	< 1
Bromochloromethane	-	-	-	-	< 1	-	< 1
Bromodichloromethane	-	-	-	< 1	< 1	< 1	< 1
Bromoform	-	-	-	< 1	< 1	< 1	< 1
Bromomethane	-	-	-	-	< 2	-	< 2
2-Butanone (MEK)	-	-	-	-	< 5	-	< 5
Carbon disulfide	-	-	-	<2	-	<2	-
Carbon tetrachloride	-	-	-	< 1	< 1	< 1	< 1
Chlorobenzene	-	-	-	< 1	< 1	< 1	< 1
Chloroethane	-	-	-	< 2	< 1	< 2	< 1
Chloroform	-	-	-	< 1	< 1	< 1	< 1
Chloromethane	-	-	-	-	< 1	-	< 1
2-Chlorotoluene	-	-	-	-	< 1	-	< 1
4-Chlorotoluene	-	-	-	-	< 1	-	< 1
1,2-Dibromo-3-chloropropane	-	-	-	-	< 5	-	< 5
Dibromochloromethane	-	-	-	< 1	< 1	< 1	< 1
1,2-Dibromoethane (EDB)	-	-	-	-	< 1	-	< 1
Dibromomethane	-	-	-	-	< 1	-	< 1
1,2-Dichlorobenzene	-	-	-	-	< 1	-	< 1
1,3-Dichlorobenzene	-	-	-	-	< 1	-	< 1
1,4-Dichlorobenzene	-	-	-	-	< 1	-	< 1
Dichlorodifluoromethane	-	-	-	-	< 1	-	< 1
1,1-Dichloroethane	< 5	< 1	< 1	< 1	< 1	< 1	< 1
1,2-Dichloroethane	-	-	-	< 1	< 1	< 1	< 1
1,1-Dichloroethene	-	-	-	< 1	< 1	< 1	< 1
cis-1,2-Dichloroethene	< 5	< 1	< 1	**6.2**	**1.7**	< 1	< 1
trans-1,2-Dichloroethene	< 5	< 1	< 1	< 1	< 1	< 1	< 1
1,2-Dichloropropane	-	-	-	< 1	< 1	< 1	< 1
1,3-Dichloropropane	-	-	-	-	< 1	-	< 1
2,2-Dichloropropane	-	-	-	-	< 1	-	< 1
1,1-Dichloropropene	-	-	-	-	< 1	-	< 1
cis-1,3-Dichloropropene	-	-	-	< 1	< 1	< 1	< 1
trans-1,3-Dichloropropene	-	-	-	< 1	< 1	< 1	< 1
Diisopropyl ether	-	-	-	-	< 1	-	< 1
Ethylbenzene	-	-	-	< 1	< 1	< 1	< 1
Hexachloro-1,3-butadiene	-	-	-	-	< 1	-	< 1
2-Hexanone	-	-	-	< 10	< 5	< 10	< 5
p-Isopropyltoluene	-	-	-	-	< 1	-	< 1
Methyl bromide	-	-	-	< 2	-	< 2	-
Methyl chloride	-	-	-	< 2	-	< 2	-
Methylene Chloride	< 5	< 4	< 4	< 2	< 2	< 2	< 2
Methyl ethyl ketone	-	-	-	< 5	-	< 5	-
4-Methyl-2-pentanone (MIBK)	-	-	-	< 5	< 5	< 5	< 5
Methyl-tert-butyl ether	-	-	-	-	< 1	-	< 1
Naphthalene	-	-	-	-	< 1	-	< 1
Styrene	-	-	-	< 1	< 1	< 1	< 1
1,1,1,2-Tetrachloroethane	-	-	-	-	< 1	-	< 1
1,1,2,2-Tetrachloroethane	-	-	-	< 1	< 1	< 1	< 1
Tetrachloroethene	-	-	-	< 1	< 1	< 1	< 1
Toluene	-	-	-	< 1	< 1	< 1	< 1
1,2,3-Trichlorobenzene	-	-	-	-	< 1	-	< 1
1,2,4-Trichlorobenzene	-	-	-	-	< 1	-	< 1
1,1,1-Trichloroethane	-	-	-	< 1	< 1	< 1	< 1
1,1,2-Trichloroethane	< 5	< 1	< 1	< 1	< 1	< 1	< 1
Trichloroethene	< 5	< 1	< 1	**57.6**	**13.1**	< 1	< 1
Trichlorofluoromethane	-	-	-	-	< 1	-	< 1
1,2,3-Trichloropropane	-	-	-	-	< 1	-	< 1
Vinyl acetate	-	-	-	-	< 2	-	< 2
Vinyl chloride	< 2	< 1	< 1	< 1	< 1	< 1	< 1
m&p-Xylene	-	-	-	-	< 2	-	< 2
o-Xylene	-	-	-	-	< 1	-	< 1
Xylene, Total	-	-	-	< 3	-	< 3	-

Notes and Abbreviations:
1. Results shown in **bold** were detected.
2. < - Not detected above the laboratory detection limit.
3. Only detected compounds are shown in table.
4. - Not analyzed.
5. ND = Non Detect

APPENDIX D

Rapid Bioassessment Report

HALEY & ALDRICH, INC.
400 Augusta Street
Suite 130
Greenville, SC 29601
864.214.8750

MEMORANDUM

5 April 2017
File No. 128752-003

TO: Sean McGowan
Carpenter Technology Corporation

FROM: Haley & Aldrich, Inc.
Stephen R. Clough, Ph.D., DABT
Nagi Alla/Mark Miesfeldt

SUBJECT: Rapid Bioassessment Results
Former General Time Facility
100 Newton Bridge Road, Athens, Georgia
HSI Site Number 10355

Haley & Aldrich has completed a site reconnaissance of several water bodies in the vicinity of the Former General Time Facility (the Site). The purpose of this work was to evaluate the current condition of the both the aquatic habitat and benthic macroinvertebrate communities in the primary headwater stream (herein unnamed tributary) and applicable wetlands west of the Site, as well as the North Oconee River. The method of assessment employed the USEPA Rapid Bioassessment Protocol (RBP, USEPA, 1989; 1999) which allows the user to make a semi-quantitative evaluation (categorical scoring) of both the stream habitat and the composition of the benthic community.

BACKGROUND

The Site is the former the Westclox Division of General Time that produced various types of clocks and stationary time pieces. In 1954 facility was built on undeveloped, rural land and operated until 1969 when they merged with Talley Industries. Facility operations consisted of metal and plastic parts manufacturing, assembly, painting, parts cleaning, packaging, and shipping. From 1969 until 1988, the facility operated as a subsidiary of Talley Industries, which is owned by Carpenter Technology Corporation (CTC). In 1988, General Time became a separate manufacturing entity. General Time has ceased operation and the facility has been vacant since 2000.

Investigations at the Site in 1991 indicated the presence of trichloroethene (TCE) and trace levels of other chlorinated volatile organic compounds (VOCs) in groundwater monitoring wells near a cistern located east of a loading dock at the rear of the facility (close to the eastern property boundary with Georgia Power). In March 1992, a supply line from a tanker unloading TCE to a storage tank became uncoupled and discharged an estimated 500 to 600 gallons of TCE to the ground surface. Since the release, numerous field investigations (soil and groundwater sampling) and remedial actions (soil

excavation) have been conducted at the Site to characterize the extent of TCE and breakdown products. The Site was accepted into the Georgia Voluntary Remediation Program (VRP) in April 2014 (HSI site number 10355). Consistent with the VRP, CTC has submitted Semi-annual Progress Reports to the Georgia Environmental Protection Division (EPD) describing activities that have been conducted during the prior six months.

The EPD has recently expressed concerns of VOCs impacting the wetlands near the North Oconee River, located approximately 2,200 feet east of the Site. As mentioned in the October 2016 Semiannual Progress Report (Haley & Aldrich, 2016), aquatic organisms in the North Oconee River could be exposed to Site-related contamination via groundwater discharge to surface water of the North Oconee River. Surface water samples were collected in 2013, 2014, and 2015 from the North Oconee River at two downstream locations (Figure 2, SW-1 and SW-2) and VOCs were not detected in surface water samples above laboratory detection limits. To see if the river habitat in the North Oconee River and an unnamed tributary has sustained impacts from the Site and/or up-gradient industrial operations at Georgia Power or Champion Dairy Pak, Haley & Aldrich conducted a rapid bioassessment which included a habitat assessment, measurement of conventional water quality parameters, and sampling and observation of benthic macroinvertebrate assemblages.

SCOPE OF WORK

On 8 March 2017, Haley & Aldrich completed a site reconnaissance survey by evaluating stream habitat and capturing macroinvertebrates at sampling stations located within the unnamed tributary and the North Oconee River (Figure 2). The unnamed tributary is a headwater conveyance that runs west to east, originating from an area northeast of the Site. The unnamed tributary traverses to a culvert beneath the Champion Dairy Pak facility. It then meanders downgrade to a forested shrub/scrub wetland and eventually discharges to the North Oconee River (which runs north to south). For this study, we have assumed that the reach of the North Oconee River that is upstream of the confluence with the unnamed tributary is unimpacted by the Site, and therefore it serves as a “background” or “reference” location to be used as a baseline (in terms of comparing the types of macroinvertebrates within the Unnamed Stream).

The goal of this reconnaissance was to determine the quality of the aquatic habitat and types of macroinvertebrates at several stations within the unnamed tributary. As presented in Figure 2, five stations were investigated; two stations (BS-01 and BS-02) in the North Oconee River (one upstream and one downstream of confluence of unnamed tributary into the North Oconee River) and three stations in the unnamed tributary (BS-03, BS-04, and BS-05). Because the unnamed tributary is a headwater, it was not possible to investigate stations up-gradient of the North Oconee River flood plain (e.g. within the utility easement) due the lack of stream flow (shallow water). A small emergent wetland (herein Observed Forested Wetland) was also identified just west of station BS-02.

The Site reconnaissance survey employed USEPA Rapid Bioassessment Protocols (Plafkin et al., 1989; Barbour et al., 1999) which provide, if local conditions permit, a semi-quantitative evaluation (categorical scoring) of both the stream habitat and the benthic community. Stream habitat was assessed against ideal functional stream metrics such as bottom substrate (e.g., cobble, mud,

vegetation), channel flow regime (riffles, runs, pools), bank stability, riparian zone and water quality. If enough flow was present, a grab sample was obtained with a D-net and the types and relative abundance of macroinvertebrates were assessed. A total of five samples were collected. Water quality data is summarized in Table 1 and field data sheets are presented in Attachment A. In addition to observations made on macroinvertebrate communities, the ecosystems were also assessed for the capability to support a viable fish community.

HYDROLOGY AND WATER QUALITY

The North Oconee River originates at the northern end of the Upper Oconee River Basin, draining the eastern edges of Hall and Gwinnett counties. The night before the site visit, a rain event occurred with a total accumulation of approximately 0.25 inches. Per the USGS streamflow database, the discharge on the day of the Rapid Bioassessment was approximately 175 cubic feet per second (cfs) which is about one-half of the "median daily statistic" of 350 cfs (USGS, 2017).

As presented in Figure 2, the unnamed tributary originates as a seep to the northeast of the Site. It then runs through a conveyance under the Georgia Power Company property and daylights north of the Champion Dairy Pak property. Based on available information, Dairy Pak has a permitted NPDES discharge into the unnamed tributary, with most of the apparent volume of the stream being contributed from this effluent. The stream then flows off the property and on to a utility easement (Figure 2). Although water was flowing at every location within the unnamed tributary, the estimated discharge was relatively low (<0.1 cubic feet per second) near the confluence with the North Oconee River and decreased as one moved upstream.

Field measurements of water quality were obtained at every station using a portable YSI multimeter. Ranges of measurements on conventional field parameters were as follows:

- Temperature: 14 – 19 degrees centigrade (°C);
- pH: 6.2 – 7.0 standard units (SU);
- Dissolved oxygen: 5.5 – 9.6 milligrams/liter (mg/L)
- Specific conductivity: 0.054 – 0.070 millisiemens per centimeter (mS/cm) and
- Turbidity: 11.1 – 16.6 Nephelometric Turbidity Units (NTU)
- Oxidation-reduction potential: 51 – 134 millivolts (mV).

All water quality measurements were within normal ranges for natural waters (Hem, 1989) and none of the values (temperature, pH, D.O.) measured exceeded Georgia Water Quality Standards. Specific conductivity and pH were slightly lower in the unnamed tributary (respective averages of 0.057 mS/cm and 6.4 S.U.) compared to values observed in the North Oconee (averages of 0.069 mS/cm and 6.8 S.U.). Turbidity in the unnamed tributary was essentially the same as values measured in the North Oconee River.

STATION-SPECIFIC OBSERVATIONS USING USEPA RAPID BIOASSESSMENT PROTOCOLS

As discussed above, stream habitat was assessed using USEPA Rapid Bioassessment Protocols which includes categorical scoring of bottom substrate (e.g., cobble, mud, vegetation, siltation), channel flow regime (stability and quality of riffles, runs and pools), bank stability, riparian zone and water quality. Once scoring of the station habitat was complete, macroinvertebrates were sampled from the bottom (aquatic vegetation, cobble, snags, leaf packs) using a D-frame dip net, placed into a wash basin, and evaluated for types (identified to genus), relative abundance and diversity.

North Oconee River

Two stations were located within the North Oconee River: station BS-01 was located approximately 200 feet downstream of the unnamed tributary discharge point and sampling station BS-02 was located approximately 200 feet upstream of the unnamed tributary discharge point (See Figure 1). Station BS-02 was upstream of the unnamed tributary confluence and therefore would be considered a "background", or reference location, i.e. unaffected by the unnamed tributary discharge. Temperature, dissolved oxygen (D.O.), pH, specific conductivity, and turbidity were similar for both stations (Table 1) and measurements were within normal limits for natural waters (Hem, 1989). Oxidation-reduction potential was positive.

Habitat scores for BS-01 and BS-02 were similar (156 and 168, respectively). Bottom substrate was mostly sand with a lesser mix of silt and clay. Fallen trees and large snags were observed in the river, creating areas of turbulence which, in turn, oxygenates the water column. This large debris serves as ideal habitat for macroinvertebrates as periphyton and leaf packs provide food and shelter. Most banks were stable with smaller areas of erosion on outer bends and siltation/deposition on the inner bends. The flood plain was undisturbed and vegetation was dominated by trees and shrubs with sparse leaf litter.

Macroinvertebrates observed using USEPA RBP included pollution sensitive (e.g. larvae of mayflies, caddisflies, stoneflies) and pollution-tolerant organisms (e.g. larvae of blackflies, beetles, chironomid midges). Photographs of BS-01 and BS-02 are presented in Attachment B (Photos 1 through 9). In particular, all three of the "EPT" genera (Ephemeroptera, Plecoptera and Trichoptera) that USEPA considers to be pollution-sensitive were present at both stations.

Photographs of sensitive mayflies (Siphlonuridae spp.), stoneflies (Agnetina spp.) and caddisflies (Leptoceridae spp.) are presented in photographs 3, 7 and 8 (Attachment B). On a scale of 1 to 10, with 1 being the most pollution-sensitive and 10 being the most pollution-tolerant, most of these organisms are below a score of 3 (Barbour et al., 1999, Appendix B). The presence of these very sensitive organisms indicates that conventional parameters (e.g. pH, conductivity) and/or chemical stressors are, in all likelihood, not adversely affecting the benthic macroinvertebrate community in North Oconee River.

Small forage fish were observed at both stations in the North Oconee River. Based on the general observations of water quality, hydrology, stream habitat, and the abundance and diversity of macroinvertebrates, the river would certainly be capable of supporting larger game fish populations.

Unnamed Tributary

Sampling of the unnamed tributary commenced from downstream (BS-03) to upstream (BS-05) in order to avoid disturbing resting macroinvertebrates (Figure 2). As presented in Table 1, the quality of the water was good and values were similar to conventional measurements made in the North Oconee River. Photographs of BS-03, BS-04, BS-02 are presented in Attachment B (Photos 10 through 16).

BS-03 was located near the confluence of the unnamed tributary and the North Oconee river. The total habitat score of 82 was approximately one half of the scores recorded in the North Oconee River, with five of the eight habitat metrics falling in the "marginal" to "poor" category. The bottom substrate was muddy, there was no aquatic vegetation, the stream banks were not stable and there were few pools and riffles. Despite the poor stream habitat, sampling of leaf packs and litter revealed amphipods, chironomids, mayflies and water fleas (Daphnia spp.). Daphnia spp. are a very sensitive class of aquatic organisms that are routinely used in aquatic toxicity testing. Fish (minnows) were also observed in the deeper areas of this reach.

BS-04 also had a relatively low habitat score (109) with seven of the ten metrics falling within the "marginal" to "poor" category. Amphipods were dominant and the types of organisms sampled were similar to those observed at BS-03 (apart from daphnids which were not present).

The riparian zone in the location at BS-05 was completely different from the other stations as this part of the reach of the unnamed tributary was located within a utility easement. The lack of tree root systems within this reach, combined with a steeper slope, has resulted in severe erosion during storm events. Sedimentation was very heavy and the low flow at this station prevented the sampling of any aquatic invertebrates. Some flow may have been 'hyporheic' (beneath the surface) given the nature of the erosion.

Despite the poor habitat and very low flow within the unnamed tributary, the water quality was still good and sensitive organisms (e.g. daphnids and mayflies) were still observed within leafy/woody debris. Based on these observations, it can be concluded that site-related stressors (e.g. VOCs) are not adversely affecting the quality of the unnamed tributary. It is readily apparent that physical impacts, principally erosion and high discharges during storm events, are most likely the major stressor to this small headwater system.

Observed Forested Wetland

An emergent forested wetland that, at the time, was partly fed by a small braided channel from the unnamed tributary, was observed just west of station BS-02 (Figure 2). This wetland was not sampled for biota as the substrate was mucky and the water was warm and stagnant. It also appeared, based on the hydrology and vegetation, to be a seasonal wetland, i.e. most of the ponded water is a result of direct precipitation.

CONCLUSIONS

Water quality measurements at all sampling stations were within normal ranges for natural waters (Hem, 1989) and all of the values met Water Quality Standards promulgated for the State of Georgia. Habitat scores for the North Oconee River using the Rapid Bioassessment Protocols showed values generally within the same range (156 – 168) and the presence of sensitive "EPT" organisms demonstrates no adverse effects due to chemical stressors. This water body also supports forage fish and, based on in-stream observations, most likely supports a healthy game fish population.

Due to very low flow and shallow waters, the unnamed tributary would likely not be able to support a viable fish population (small minnows near the confluence likely originated from the North Oconee River). The habitat scores in the Unnamed Stream (82-109) were markedly lower than the North Oconee River. The unnamed tributary had a muddier substrate, less vegetative protection, weaker bank stability and more sediment deposition. Despite the poor habitat, sensitive organisms were collected in the lower reaches of the unnamed tributary. The conclusion of the RBP evaluation for this waterbody is that physical effects (e.g. siltation), rather than any site-related effects, are the main stressor.

An additional line-of-evidence indicating a lack of chemical exposure is the fact that VOCs have not been detected in samples obtained from the North Oconee River. Even if VOCs were present in surface water within the unnamed tributary, the lowest observe effect level for freshwater organisms exposed to trichloroethylene are approximately 1.7 mg/L (USEPA, 2017).

REFERENCES

Barbour, MT, J Gerritsen, BD Snyder, and JB Stribling, 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish. Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

Haley & Aldrich, 2017. April 2017 Semi-Annual Progress Report #6. Former General Time Facility, 100 Newton Bridge Road- Athens, Georgia. HSI Site Number 10355. March 2017.

Hem, JD 1989. Study and Interpretation of the Chemical Characteristics of Natural Water. Third Edition. U.S. Geological Survey Water-Supply Paper 2254. U.S. Government Printing Office, Washington, D.C. Library of Congress Catalog-Card No. 85-600603

Macroinvertebrate Biological Assessment of Wadeable Streams in Georgia, Standard Operating Procedures. Version 1.0. Georgia Department of Natural Resources, Environmental Protection Division, Watershed Protection Branch. March 2007.

Plafkin, JL, Barbour, MT, Porter, KD Gross, SK and Hughes, RM., 1989. Rapid Bioassessment Protocols for Use in Streams and Rivers: Benthic Macroinvertebrates and Fish. United States Environmental Protection Agency, Office of Water, Assessment and Watershed Division, Washington, DC. EPA/444/4-89-001. May, 1989.

USEPA, 2017. U.S. EPA ECOTOXicology database (ECOTOX), Version 4. Office of Research and Development and National Health and Environmental Effects Research Laboratory Mid-Continent Ecology Division. Query conducted for "trichloroethylene". March 3rd, 2017. https://cfpub.epa.gov/ecotox/index.html

USGS, 2017. USGS real-time hydrology database for North Oconee River at College St, at Athens, GA (USGS HUC 02217770) at: https://waterdata.usgs.gov/usa/nwis/uv?02217770

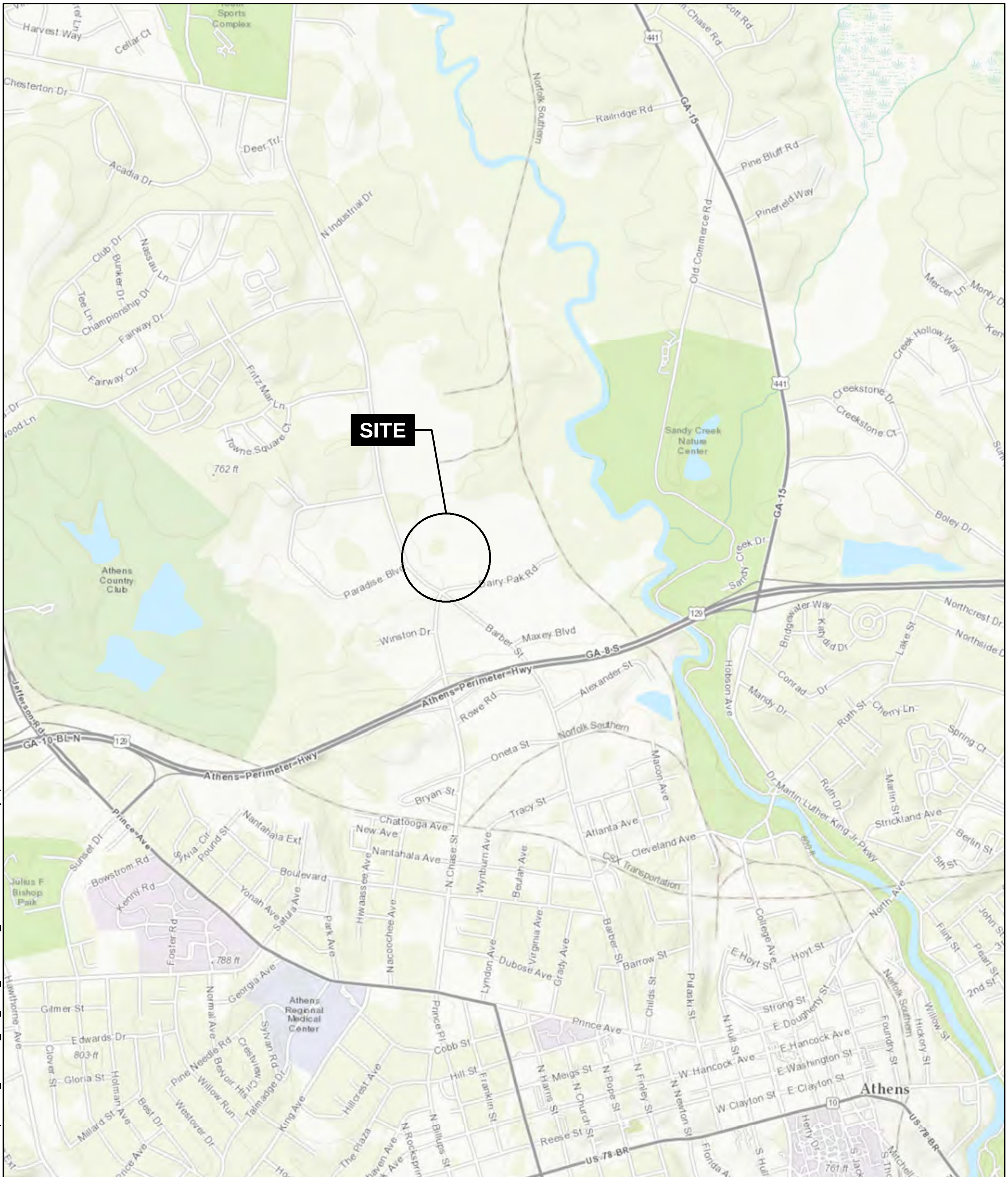
TABLE I
WATER QUALITY MEASUREMENTS
CARPENTER TECHNOLOGY CORPORATION
ATHENS, GEORGIA

Field Parameters	Georgia Surface Water Quality Criteria	Units	North Oconee River		Unnamed Stream		
			BS-01	BS-02	BS-03	BS-04	BS-05
Water Temperature	< 32	°C	14.4	15.45	16.63	18.51	17.88
pH	6.0 - 9.5	S.U.	7.01	6.65	6.23	6.5	6.54
Dissolved Oxygen	> 5	mg/L	9.67	9.66	5.53	9.00	6.93
ORP	-	mV	92.3	133.8	50.7	125.4	89
Specific Conductivity	-	mS/cm	0.068	0.07	0.054	0.057	0.062
Turbidity	-	NTU	15.5	11.1	16.6	13.4	15.7

Notes & Abbreviations

°C : degree Celsius
S.U. : Standard Unit
mg/L: milligrams/liter
ORP : Oxidation-Reduction Potential
mV : millivolts
mS/cm : millisiemens per centimeter
NTU : Nephelometric Turbidity Unit

1. Parameters were collected via a YSI 650 MDS on 8 March 2017.
2. To prevent disturbance of resting organisms, parameters were collected from downstream to upstream.
3. Georgia Surface Water Quality Criteria obtained from GA 391-3-6-.03 - Water Use Classifications and Water Quality Standards: http://epd.georgia.gov/sites/epd.georgia.gov/files/related_files/site_page/391-3-6-.03%20Triennial%2013%20Final%20Edits.pdf



MAP SOURCE: ESRI
USGS QUAD: ATHENS WEST
SITE COORDINATES: 82°23'13"N,33°58'50"

HALEY ALDRICH

GENERAL TIME FACILITY
ATHENS, GEORGIA

SITE LOCATION MAP

APPROXIMATE SCALE: 1 IN = 2000 FT
OCTOBER 2016

FIGURE 1

GIS FILE PATH: C:\ajospe\projects\38111\Global\GIS\Maps\2015_09\38111_000_0001_PROJECT_LOCUS.mxd — USER: ajospe — LAST SAVED: 10/10/2016 6:56:04 PM

ABB-WESTINGHOUSE

SOUTHERN RAILROAD

NORTH OCONEE RIVER

UNNAMED STREAM

MW-14I
MW-14D
MW-4I
BS-02
BS-03
BS-04
SW-1
MW-11D
MW-11I
MW-11S
BS-05
BS-01
MW-12I
MW-12D
MW-7I
EVIDENCE OF DUMPING
FORMER GENERAL TIME FACILITY
MW-1S
MW-1I
MW-5I
NEWTON BRIDGE ROAD
FORMER COOLING TOWER AREA
RW-1
RW-2
MW-2I
MW-2S
MW-2D
MW-16D
FORMER VAPOR DEGREASER AREA
FORMER CISTERN AREA
RW-3
MW-16I
RW-4
GEORGIA POWER COMPANY
FORMER CENTRIFUGE AREA
1992 TCE SPILL EXCAVATION AREA
CHAMPION DAIRY PAK
MW-8I
MW-9D
MW-9I
MW-6I
MW-3I
NORTHEAST SALES
ATHENS STEEL
PEEL CO. INC.
MW-13I
MW-10IR
MW-10D
SW-2
MW-15I
BARBER STREET
CHASE STREET
ATHENES PERIMETER

LEGEND

- RAPID BIOASSESSMENT PROTOCOL STATION
- NPDES DISCHARGE POINT
- OBSERVED FORESTED WETLAND
- STREAM
- CULVERTED STREAM
- NORTH OCONEE RIVER SURFACE WATER SAMPLING LOCATION
- SHALLOW MONITORING WELL
- INTERMEDIATE MONITORING WELL
- DEEP MONITORING WELL
- RECOVERY MONITORING WELL
- RAILROAD

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: ESRI

N

0 400 800
SCALE IN FEET

HALEY ALDRICH

GENERAL TIME FACILITY
ATHENS, GEORGIA

SITE PLAN SHOWING RAPID BIOASSESSMENT PROTOCOL (RBP) STATIONS

APRIL 2017

FIGURE 2

GIS FILE PATH: G:\38111_Carpenter\Global\GIS\Maps\2017_04\38111_000_0000_RBP_FIGURE_2.mxd — USER: lng — LAST SAVED: 4/5/2017 1:31:08 PM

ATTACHMENT A

FIELD DATA SHEETS

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME: North Oconee River		**SITE (or ID) #:** BS-01	
LAT (DD):	**LONG (DD):**		
LAT (D,M,S):	**LONG (D,M,S):**		
INVESTIGATORS: S. Clough + T. Ng	**FORM COMPLETED BY:** T. Ng		
PROJECT: Carpenter Technologies	**DATE** 10.40 **TIME** (AM) PM	**REASON FOR SURVEY:** RBP	
FIELD SEASON: Late Winter (March)	**COMMENTS:** West bank (looking upstream) Riparian access easy, shoreline access hazardous (steep), River turbid - difficult to see depth - too deep for hip waders		

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 (13) 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE	20 19 18 17 16	15 14 13 12 11	10 (9) 8 7 6	5 4 3 2 1 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	20 19 18 17 16	15 14 13 (12) 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 (16)	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 (18) 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET – LOW GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	(20) 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 (14) 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 8 (LB)	Left Bank 10 9	(8) 7 6	5 4 3	2 1 0
SCORE 8 (RB)	Right Bank 10 9	(8) 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 9 (LB)	Left Bank 10 (9)	8 7 6	5 4 3	2 1 0
SCORE 9 (RB)	Right Bank 10 (9)	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 10 (LB)	Left Bank (10) 9	8 7 6	5 4 3	2 1 0
SCORE 10 (RB)	Right Bank (10) 9	8 7 6	5 4 3	2 1 0

Total Score 156

Physical Characterization and Water Quality Field Data Sheet (Front)

STREAM NAME: North Oconee River	**SITE # (ID):** BS-01	
LATITUDE (DD):	**LONGITUDE (DD):**	
LATITUDE (D,M,S):	**LONGITUDE (D,M,S):**	
INVESTIGATORS: S. Clough + T. Ng		
FORM COMPLETED BY: T. Ng	**DATE:** 3/8/17	**REASON FOR SURVEY:** RBP
PROJECT: Carpenter Technologies	**TIME:** 1040 (AM) PM	

SITE LOCATION/MAP	**Draw a map of the site and indicate the areas sampled:** See figure 2	
STREAM CHARACTERIZATION	**Subsystem Classification** ☒ Perennial ☐ Intermittent ☐ Tidal **Stream Origin** ☒ Other Natural Watershed ☐ Swamp & Bog ☐ Spring Fed ☐ Unsure	**Stream Type (mark one from each group)** ☐ Coldwater ☒ Warmwater ☐ Clearwater ☐ Blackwater
WEATHER CONDITIONS	**Now** **Past 24 hours** ☐ ☐ storm (heavy rain) ☐ ☒ rain (steady rain) ☐ ☐ showers (intermittent) ☐ ____% ☐ ____%cloud cover ☒ ☐ clear/sunny	**Has there been a heavy rain in the last 7 days?** ☒ Yes ☐ No **Air Temperature** 15.5 °C 60°F **Other**_____

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

RIPARIAN ZONE/ INSTREAM FEATURES

Predominant Surrounding Land Use
☒ Forest ☐ Commercial
☐ Pasture ☐ Industrial
☐ Agricultural ☐ Planted Pine (Silviculltural)
☐ Residential ☐ Cropland_____
☐ Clear Cut ☐ Other_____
☐ Livestock_____

Local Watershed NPS Pollution
☒ No evidence ☐ Some potential sources
☐ Obvious sources ☐ _____

Canopy Cover
☒ Open (0-10%) ☐ Partly open (11-45%)
☐ Partly shaded (46-80%) ☐ Shaded (81-100%)

Local Water Erosion
☐ None ☒ Moderate ☐ Heavy

BEAVER ACTIVITY BASED ON OBSERVATIONS:
☐ Active Beaver Dam Affecting Stream
☐ Inactive Beaver Dam Affecting Stream
☐ Active Beaver Dam/Cutting Evident But Little Effect
☐ Old Beaver Dam/ Activity, Little Effect
☐ Inactive Beaver Dam, Little Effect on Stream
☒ No Beaver Activity Evident

LIVESTOCK DAMAGE BASED ON OBSERVATIONS:
☒ No Livestock Damage
☐ Stable (0-25% Damage, Little/No Erosion)
☐ Moderate (25-50%) Damage, < 50% Plant Biomass Remains)
☐ High (51-75 % Damage, <25% Plant Biomass Remains)
☐ Severe (76-100% Damage, Little/No Plant Biomass Remains)

High Water Mark 2 m
Estimated Stream Width 60 m
Estimated Stream Depth
☒ Riffle 0.5 m ☒ Run 1.5 m
☐ Pool _____ m
Reach Morphological Types (% in reach):
☒ Riffle 10 % ☒ Run 90 %
☐ Pool _____ %
Average Surface Velocity 0.5 m/sec (at thalweg)
Estimated Reach Length 100m
Channelized? ☐ Yes ☒ No ☐ Full ☐ Partial
Dredging? ☐ Yes ☒ No

Dam Present? ☐ Yes ☒ No
If Present: ☐ Upstream ☐ Downstream ☐ In Reach

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present:
☒ Trees ☒ Shrubs ☐ Grasses ☐ Herbaceous
dominant species present: Thick understory 30 ft high

Check one that best applies:
☐ Brush – dominated by alders, willows, et.
☒ Forested – dominated by tress with brushy understory
☐ Grass- bank covered with tall grasses, sedges, etc.
☐ Exposed – bare rock, soil, rock, etc.

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free Floating
☐ Floating Algae ☒ Attached Algae

dominant species present _____

Portion of the reach with vegetative cover 5 %

SEDIMENT/ SUBSTRATE

Odors
☒ Normal ☐ Sewage ☐ Petroleum ☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand
☐ Chemical ☐ Anaerobic ☒ None ☐ Relict shells ☐ Other_____
☐ Other_____

Oils
☒ Absent ☐ Slight ☐ Moderate ☐ Profuse

Looking at stones which are not deeply embedded, are the undersides black in color?
☐ Yes ☐ No NA (muddy)

WATER QUALITY

Water Odors
☒ Normal/None ☐ Sewage
☐ Petroleum ☐ Chemical
☐ Fishy ☐ Other_____

Water Color
☐ Tannic ☐ Clear
☐ Green (Algae) ☒ Other Mod. Turbidity

Water Surface Oils
☐ Slick ☐ Sheen ☐ Globs ☐ Flecks
☒ None ☐ Other_____

Turbidity (visual measurement)
☐ Clear ☐ Slightly turbid ☒ Turbid
☐ Opaque ☐ Water color ☐ Other_____

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	10
Muck-Mud	black, very fine organic (FPOM)	90
Marl	grey, shell fragments	0

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		0
Boulder	> 256 mm (10")	0
Cobble	64-256 mm (2.5" –10")	0
Gravel	2-64 mm (0.1"-2.5")	0
Sand	0.06-2mm (gritty)	0
Silt	0.004-0.006mm	90
Clay	<0.004mm (slick)	10

Comments: _____

In-situ and Grab Sample Water Chemistry Field Sheet

STREAM NAME: North Oconee		**SITE # (ID):** BS-01	
LATITUDE (DD):		**LONGITUDE (DD):**	
LATITUDE (D,M,S):		**LONGITUDE (D,M,S):**	
INVESTIGATORS: S. Clough ; T. Ng			
FORM COMPLETED BY: T. Ng		**DATE:** 3/8/17	**REASON FOR SURVEY:** RBP
PROJECT: Carpenter Technology		**TIME:** 1040 (AM) PM	

Depth Calibration for Water Quality Multiprobe				
Initial Reading	Adjust To	Temperature	Final Reading	Δ Initial to Final

In-situ Field Chemistry Data			
Unit used: YSI 650 MDS			
Water Temperature: 14.9 mS °C		**Depth (m):** 8.5 ft	
Specific Conductance: 0.068 (~~µmhos~~/cm)		**Salinity:** —	
Dissolved Oxygen (mg/L):		**Dissolved Oxygen:** 94.7 (9.67 mg/L) %	
pH: 7.01		**Air Temperature:** 15.5 °C	

ORP: 92.3

In-situ Turbidity Measurement		
Unit used: Same as above		
Turbidity: 15.5	**NTU**	

Name of Lab to Send Grab Samples: NA		
Sample ID #: NA	**# of Bottles Collected:**	
Parameters		
Total Suspended Solids		
Alkalinity		
No preservative		**Half-Gallon bottle**
Clean Metals (ICP/MS)	**Preservative: HNO_3, <2 pH**	**500mL plastic bottle**
Metals blank collected at this site? Yes or No		
Alkalinity **No preservative**	**250 ml bottle**	
Total Kjeldahl Nitrogen (TKN)	**Ammonia (NH_3)**	
Nitrate-Nitrite (NO_2-NO_3)	**Total Organic Carbon (TOC)**	
Preservative H_2SO_4, pH <2	**250 ml bottle**	
Ortho-phosphate	**Total Phosphorus**	
Preservative H_2SO_4, pH <2	**250 ml bottle**	

Sampled by (signature):	Date/Time:	Team Leader/Received (signature):	Date/Time:

Date/Time Delivered to Name of Lab Here:	Date/Time Delivered or Sent to Name of Lab Here:

BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME: North Oconee River		**SITE # (or ID#):** BS-01	
LATITUDE (DD):	**LONGITUDE (DD):**		
LATITUDE (D,M,S):	**LONGITUDE (D,M,S):**		
INVESTIGATORS: S. Clough + T. Ng			
FORM COMPLETED BY: T. Ng	**DATE** 3/6/17	**REASON FOR SURVEY:**	
PROJECT: Carpenter Techology	**TIME** 1145 AM PM	RBP	
Field Collector of Benthos: SRC/T. Ng	**Field Processor of Benthos:**		

HABITAT TYPES	**Indicate the percentage of each habitat type present** Riffles 5 % Snags 5 % Banks/ root mats 0 % Soft/Sandy sediment 85 % Leaf packs 5 % Submerged Macrophytes 0 %
SAMPLE COLLECTION	**Gear used:** (D-frame, 500 µm net) **How were the samples collected?** (Wading) **Indicate the number of jabs/kicks taken in each habitat type.** Riffles (fast)_____ Riffles (slow) 2 Snags 2 Banks/ root mats_____ Soft/Sandy sediment_____ Leaf packs 2 Submerged Macrophytes_____ Other ( )_____ **Total # of Jabs:** 6 **# of Jabs Reallocated (if any):**_____ **Total # of Bottles collected:**_____
GENERAL COMMENTS	

QUALITATIVE LISTING OF AQUATIC BIOTA
Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare, 2 = Common, 3= Abundant, 4 = Dominant

Periphyton	0	1	(2)	3	4	Slimes	(0)	1	2	3	4
Filamentous Algae	(0)	1	2	3	4	Macroinvertebrates	0	1	(2)	3	4
Macrophytes	0	(1)	2	3	4	Fish	0	(1)	2	3	4

FIELD OBSERVATIONS OF MACROBENTHOS
Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare (1-3 organisms), 2 = Common (3-9 organisms), 3= Abundant (>10 organisms), 4 = Dominant (>50 organisms)

Porifera	0	1	2	3	4	Anisoptera	0	1	2	3	4	Trichoptera	0	(1)	2	3	4
Hydrozoa	0	1	2	3	4	Zygoptera	0	1	2	3	4	Plecoptera	0	(1)	2	3	4
Platyhelminthes	0	1	2	3	4	Hemiptera	0	1	2	3	4	Megaloptera	0	1	2	3	4
Turbellaria	0	1	2	3	4	Coleoptera	0	(1)	2	3	4	Sialidae	0	1	2	3	4
Hirudinea	0	1	2	3	4	Lepidoptera	0	1	2	3	4	Corydalidae	0	1	2	3	4
Oligochaeta	0	1	2	3	4	Tipulidae	0	1	2	3	4	Other	0	1	2	3	4
Isopoda	0	1	2	3	4	Empididae	0	1	2	3	4						
Amphipoda	0	(1)	2	3	4	Simuliidae	0	1	2	3	(4)						
Decapoda	0	1	2	3	4	Tabanidae	0	1	2	3	4						
Gastropoda	0	1	2	3	4	Culicidae	0	1	2	3	4						
Bivalvia	0	(1)	2	3	4	Chironomidae	0	1	2	3	(4)						
						Ephemeroptera	0	1	2	3	(4)						

Note: Stoutly, apparently 4th instar Isoperla w/ various instars present

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME: North Oconee River		SITE (or ID) #: BS-02	
LAT (DD):	LONG (DD):		
LAT (D,M,S):	LONG (D,M,S):		
INVESTIGATORS: SRC + T.Ng	FORM COMPLETED BY: T.Ng		
PROJECT: Carpenter Technologies	DATE 1245 TIME AM (PM)	REASON FOR SURVEY: RBP	
FIELD SEASON: Late Winter (March)	COMMENTS:		

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 (18) 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE	20 19 18 17 16	15 (14) 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	20 19 18 17 16	15 (14) 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 (16)	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 (18) 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET – LOW GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	(20) 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 (14) 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 8 (LB)	Left Bank 10 9	(8) 7 6	5 4 3	2 1 0
SCORE 8 (RB)	Right Bank 10 9	(8) 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 9 (LB)	Left Bank 10 (9)	8 7 6	5 4 3	2 1 0
SCORE 9 (RB)	Right Bank 10 (9)	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 10 (LB)	Left Bank (10) 9	8 7 6	5 4 3	2 1 0
SCORE 10 (RB)	Right Bank (10) 9	8 7 6	5 4 3	2 1 0

Total Score 168

Physical Characterization and Water Quality Field Data Sheet (Front)

STREAM NAME: North Oconee		**SITE # (ID):** BS-02	
LATITUDE (DD):		**LONGITUDE (DD):**	
LATITUDE (D,M,S):		**LONGITUDE (D,M,S):**	
INVESTIGATORS: SRC & T.Ng			
FORM COMPLETED BY: T.Ng	**DATE:** 3/8/17	**REASON FOR SURVEY:**	
PROJECT: Carpenter Technologies	**TIME:** 1245 AM (PM)	RBP	

SITE LOCATION/MAP	**Draw a map of the site and indicate the areas sampled:** See Figure 2
STREAM CHARACTERIZATION	**Subsystem Classification** ☒ Perennial ☐ Intermittent ☐ Tidal **Stream Origin** ☒ Other Natural Watershed ☐ Swamp & Bog ☐ Spring Fed ☐ Unsure **Stream Type (mark one from each group)** ☐ Coldwater ☒ Warmwater ☐ Clearwater ☐ Blackwater
WEATHER CONDITIONS	**Now / Past 24 hours** ☐ ☐ storm (heavy rain) ☐ ☒ rain (steady rain) ☐ ☐ showers (intermittent) ☐ ____% ☐ ____%cloud cover ☒ ☐ clear/sunny **Has there been a heavy rain in the last 7 days?** ☒ Yes ☐ No **Air Temperature** 20 °C **Other**_____

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

RIPARIAN ZONE/ INSTREAM FEATURES

Predominant Surrounding Land Use
- ☒ Forest
- ☐ Pasture
- ☐ Agricultural
- ☐ Residential
- ☐ Clear Cut
- ☐ Livestock
- ☐ Commercial
- ☐ Industrial
- ☐ Planted Pine (Silviculltural)
- ☐ Cropland
- ☐ Other

Local Watershed NPS Pollution
- ☒ No evidence
- ☐ Some potential sources
- ☐ Obvious sources
- ☐ _____

Canopy Cover
- ☒ Open (0-10%)
- ☐ Partly open (11-45%)
- ☐ Partly shaded (46-80%)
- ☐ Shaded (81-100%)

Local Water Erosion
- ☐ None
- ☒ Moderate
- ☐ Heavy

BEAVER ACTIVITY BASED ON OBSERVATIONS:
- ☐ Active Beaver Dam Affecting Stream
- ☐ Inactive Beaver Dam Affecting Stream
- ☐ Active Beaver Dam/Cutting Evident But Little Effect
- ☐ Old Beaver Dam/ Activity, Little Effect
- ☐ Inactive Beaver Dam, Little Effect on Stream
- ☒ No Beaver Activity Evident

LIVESTOCK DAMAGE BASED ON OBSERVATIONS:
- ☒ No Livestock Damage
- ☐ Stable (0-25% Damage, Little/No Erosion)
- ☐ Moderate (25-50%) Damage, < 50% Plant Biomass Remains)
- ☐ High (51-75 % Damage, <25% Plant Biomass Remains)
- ☐ Severe (76-100% Damage, Little/No Plant Biomass Remains)

High Water Mark 1.25 m
Estimated Stream Width 10-15 m
Estimated Stream Depth
- ☐ Riffle _____ m ☒ Run 1.5 m
- ☒ Pool 0.5 m

Reach Morphological Types (% in reach):
- ☒ Riffle 5 % ☒ Run 90 %
- ☐ Pool _____ m

Average Surface Velocity _____ m/sec (at thalweg)
Estimated Reach Length 100m
Channelized? ☐ Yes ☒ No (☐ Full ☐ Partial)
Dredging? ☐ Yes ☒ No
Dam Present? ☐ Yes ☒ No
If Present: ☐ Upstream ☐ Downstream ☐ In Reach

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present:
☐ Trees ☒ Shrubs ☐ Grasses ☐ Herbaceous
dominant species present: Thick understory

Check one that best applies:
- ☐ Brush – dominated by alders, willows, et.
- ☒ Forested – dominated by tress with brushy understory
- ☐ Grass- bank covered with tall grasses, sedges, etc.
- ☐ Exposed – bare rock, soil, rock, etc.

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free Floating
☐ Floating Algae ☒ Attached Algae

dominant species present _____

Portion of the reach with vegetative cover _____ %

SEDIMENT/ SUBSTRATE

Odors
- ☒ Normal
- ☐ Sewage
- ☐ Chemical
- ☐ Anaerobic
- ☐ Other

Deposits
☐ Petroleum ☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand ☒ None ☐ Relict shells ☐ Other

Oils
☒ Absent ☐ Slight ☐ Moderate ☐ Profuse

Looking at stones which are not deeply embedded, are the undersides black in color?
☐ Yes ☐ No NA (muddy)

WATER QUALITY

Water Odors
- ☒ Normal/None
- ☐ Petroleum
- ☐ Fishy
- ☐ Sewage
- ☐ Chemical
- ☐ Other

Water Color
- ☐ Tannic
- ☐ Clear
- ☐ Green (Algae)
- ☒ Other Mod. Turbidity

Water Surface Oils
☐ Slick ☐ Sheen ☐ Globs ☒ Flecks ☐ None ☒ Other Naturally occurring

Turbidity (visual measurement)
☐ Clear ☐ Slightly turbid ☒ Turbid ☐ Opaque ☐ Water color ☐ Other

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	10
Muck-Mud	black, very fine organic (FPOM)	90
Marl	grey, shell fragments	0

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		0
Boulder	> 256 mm (10")	0
Cobble	64-256 mm (2.5" –10")	0
Gravel	2-64 mm (0.1"-2.5")	0
Sand	0.06-2mm (gritty)	5
Silt	0.004-0.006mm	85
Clay	<0.004mm (slick)	5

Comments: _____

In-situ and Grab Sample Water Chemistry Field Sheet

STREAM NAME: North Oconee	**SITE # (ID):** BS-02
LATITUDE (DD):	**LONGITUDE (DD):**
LATITUDE (D,M,S):	**LONGITUDE (D,M,S):**
INVESTIGATORS: SRC + T.Ng	
FORM COMPLETED BY: TNg	**DATE:** 13/8/17 **REASON FOR SURVEY:** RBP
PROJECT: Carpenter Technologies	**TIME:** 13:04 AM (PM)

Depth Calibration for Water Quality Multiprobe				
Initial Reading	Adjust To	Temperature	Final Reading	Δ Initial to Final

In-situ Field Chemistry Data				
Unit used: YSI 650 MDS				
Water Temperature:	15.45 ° C	**Depth (m):**	1.5 ft	
Specific Conductance:	0.070 mS/cm (µmhos/cm)	**Salinity:**	—	
Dissolved Oxygen (mg/L):	9.66	**Dissolved Oxygen:**	98	%
pH:	6.65	**Air Temperature:**	20.6	° C
		ORP:	133.8	

In-situ Turbidity Measurement		
Unit used:	//	
Turbidity:	11.1	**NTU**

Name of Lab to Send Grab Samples: NA	
Sample ID #: NA	**# of Bottles Collected:**
Parameters	
Total Suspended Solids	
Alkalinity	
No preservative	**Half-Gallon bottle**
Clean Metals (ICP/MS)	**Preservative: HNO_3, <2 pH** **500mL plastic bottle**
Metals blank collected at this site? Yes or No	
Alkalinity **No preservative**	**250 ml bottle**
Total Kjeldahl Nitrogen (TKN)	**Ammonia (NH_3)**
Nitrate-Nitrite (NO_2-NO_3)	**Total Organic Carbon (TOC)**
Preservative H_2SO_4, pH <2	**250 ml bottle**
Ortho-phosphate	**Total Phosphorus**
Preservative H_2SO_4, pH <2	**250 ml bottle**

Sampled by (signature):	Date/Time:	Team Leader/Received (signature):	Date/Time:

Date/Time Delivered to Name of Lab Here:	Date/Time Delivered or Sent to Name of Lab Here:

BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME: North Oconee		**SITE # (or ID#):** BS-02	
LATITUDE (DD):	**LONGITUDE (DD):**		
LATITUDE (D,M,S):	**LONGITUDE (D,M,S):**		
INVESTIGATORS: SRC + T.Ng			
FORM COMPLETED BY: T.Ng	**DATE** 3/8/17	**REASON FOR SURVEY:**	
PROJECT: Carpenter Technology	**TIME** 1304 AM (PM)	RBP	
Field Collector of Benthos: SRC / T.Ng	**Field Processor of Benthos:**		

HABITAT TYPES	**Indicate the percentage of each habitat type present** Riffles 5 % Snags 5 % Banks/ root mats 5 % Soft/Sandy sediment 80 % Leaf packs 5 % Submerged Macrophytes ____ %
SAMPLE COLLECTION	**Gear used:** (D-frame), 500 µm net **How were the samples collected?** (Wading) **Indicate the number of jabs/kicks taken in each habitat type.** Riffles (fast)____ Riffles (slow) 2 Snags 2 Banks/ root mats____ Soft/Sandy sediment____ Leaf packs 2 Submerged Macrophytes____ Other ( )____ **Total # of Jabs:** 6 **# of Jabs Reallocated (if any):**____ **Total # of Bottles collected:**____
GENERAL COMMENTS	

QUALITATIVE LISTING OF AQUATIC BIOTA
Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare, 2 = Common, 3= Abundant, 4 = Dominant

Periphyton	0	1	(2)	3	4	Slimes	(0)	1	2	3	4
Filamentous Algae	(0)	1	2	3	4	Macroinvertebrates	0	1	(2)	3	4
Macrophytes	0	(1)	2	3	4	Fish	0	(1)	2	3	4

FIELD OBSERVATIONS OF MACROBENTHOS
Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare (1-3 organisms), 2 = Common (3-9 organisms), 3= Abundant (>10 organisms), 4 = Dominant (>50 organisms)

Porifera	0	1	2	3	4	Anisoptera	0	1	2	3	4	Trichoptera	0	(1)	2	3	4
Hydrozoa	0	1	2	3	4	Zygoptera	0	1	2	3	4	Plecoptera	0	(1)	2	3	4
Platyhelminthes	0	1	2	3	4	Hemiptera	0	1	2	3	4	Megaloptera	0	1	2	3	4
Turbellaria	0	1	2	3	4	Coleoptera	0	1	2	3	4	Sialidae	0	1	2	3	4
Hirudinea	0	1	2	3	4	Lepidoptera	0	1	2	3	4	Corydalidae	0	1	2	3	4
Oligochaeta	0	1	2	3	4	Tipulidae	0	1	2	3	4	Other	0	1	2	3	4
Isopoda	0	1	2	3	4	Empididae	0	1	2	3	4	Springtail	0	(1)	2	3	4
Amphipoda	0	(1)	2	3	4	Simuliidae	0	1	2	(3)	4						
Decapoda	0	(1)	2	3	4	Tabanidae	0	1	2	3	4						
Gastropoda	0	1	2	3	4	Culicidae	0	1	2	3	4						
Bivalvia	0	1	2	3	4	Chironomidae	0	1	2	(3)	4						
						Ephemeroptera	0	1	2	3	(4)						

Oecitis

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME: North Oconee Tributary		**SITE (or ID) #:** BS-03	
LAT (DD):	**LONG (DD):**		
LAT (D,M,S):	**LONG (D,M,S):**		
INVESTIGATORS: SRC + TNg	**FORM COMPLETED BY:** TNg		
PROJECT: Carpenter Technology	**DATE** 1350 **TIME** AM (PM)	**REASON FOR SURVEY:** RBP	
FIELD SEASON: Late Winter (March)	**COMMENTS:**		

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 (8) 7 6	5 4 3 2 1 0
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 (7) 6	5 4 3 2 1 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 (8) 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	(5) 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 (7) 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET – LOW GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 (18) 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 (9) 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 3	(2) 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 3	(2) 1 0
9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 3	2 (1) 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 3	2 (1) 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE ___ (LB)	Left Bank 10 9	8 (7) 6	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 (7) 6	5 4 3	2 1 0

Total Score 82

Physical Characterization and Water Quality Field Data Sheet (Front)

STREAM NAME: North Pearsee Trib		**SITE # (ID):** BS-03	
LATITUDE (DD):		**LONGITUDE (DD):**	
LATITUDE (D,M,S):		**LONGITUDE (D,M,S):**	
INVESTIGATORS: SRC + TNg			
FORM COMPLETED BY: TNg		**DATE:** 3/8/17	**REASON FOR SURVEY:**
PROJECT: Carpenter Technologies		**TIME:** 1350 AM (PM)	RBP

SITE LOCATION/MAP	**Draw a map of the site and indicate the areas sampled:** See Figure 2	
STREAM CHARACTERIZATION	**Subsystem Classification** ☒ Perennial ☒ Intermittent ☐ Tidal **Stream Origin** ☒ Other Natural Watershed ☐ Swamp & Bog ☐ Spring Fed ☐ Unsure	**Stream Type (mark one from each group)** ☐ Coldwater ☒ Warmwater ☐ Clearwater ☐ Blackwater
WEATHER CONDITIONS	**Now** **Past 24 hours** ☐ ☐ storm (heavy rain) ☐ ☒ rain (steady rain) ☐ ☐ showers (intermittent) ☐ ____% ☐ ____%cloud cover ☒ ☐ clear/sunny	**Has there been a heavy rain in the last 7 days?** ☒ Yes ☐ No **Air Temperature** 20 °C **Other**_____

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

RIPARIAN ZONE/ INSTREAM FEATURES

Predominant Surrounding Land Use
☒ Forest ☐ Commercial
☐ Pasture ☐ Industrial
☐ Agricultural ☐ Planted Pine (Silviculltural)
☐ Residential ☐ Cropland_____
☐ Clear Cut ☐ Other_____
☐ Livestock_____

Local Watershed NPS Pollution
☒ No evidence ☐ Some potential sources
☐ Obvious sources ☐ _____

Canopy Cover
☐ Open (0-10%) ☒ Partly open (11-45%)
☐ Partly shaded (46-80%) ☐ Shaded (81-100%)

Local Water Erosion
☐ None ☐ Moderate ☒ Heavy

BEAVER ACTIVITY BASED ON OBSERVATIONS:
☐ Active Beaver Dam Affecting Stream
☐ Inactive Beaver Dam Affecting Stream
☐ Active Beaver Dam/Cutting Evident But Little Effect
☐ Old Beaver Dam/ Activity, Little Effect
☐ Inactive Beaver Dam, Little Effect on Stream
☒ No Beaver Activity Evident

LIVESTOCK DAMAGE BASED ON OBSERVATIONS:
☒ No Livestock Damage
☐ Stable (0-25% Damage, Little/No Erosion)
☐ Moderate (25-50%) Damage, < 50% Plant Biomass Remains)
☐ High (51-75 % Damage, <25% Plant Biomass Remains)
☐ Severe (76-100% Damage, Little/No Plant Biomass Remains)

High Water Mark 1-1.5 m
Estimated Stream Width 1-1.5 m
Estimated Stream Depth
☐ Riffle 1 m ☐ Run 1 m
☐ Pool _____ m
Reach Morphological Types (% in reach):
☐ Riffle 2 m ☐ Run 98 m
☐ Pool 0 m
Average Surface Velocity 0.05 m/sec (at thalweg)
Estimated Reach Length 100m
Channelized? ☐ Yes ☒ No ☐ Full ☐ Partial
Dredging? ☐ Yes ☒ No

Dam Present? ☐ Yes ☒ No
If Present: ☐ Upstream ☐ Downstream ☐ In Reach

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present:
☒ Trees ☐ Shrubs ☐ Grasses ☐ Herbaceous
dominant species present: _____

Check one that best applies:
☐ Brush – dominated by alders, willows, et.
☒ Forested – dominated by tress with brushy understory
☐ Grass- bank covered with tall grasses, sedges, etc.
☐ Exposed – bare rock, soil, rock, etc.

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free Floating
☐ Floating Algae ☐ Attached Algae ☒ None

dominant species present _____

Portion of the reach with vegetative cover 0 %

SEDIMENT/ SUBSTRATE

Odors
☒ Normal ☐ Sewage
☐ Chemical ☐ Anaerobic
☐ Other_____

Deposits
☐ Petroleum ☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand
☒ None ☐ Relict shells ☐ Other_____

Oils
☒ Absent ☐ Slight ☐ Moderate ☐ Profuse

Looking at stones which are not deeply embedded, are the undersides black in color?
☐ Yes ☐ No NA (Muddy)

WATER QUALITY

Water Odors
☒ Normal/None ☐ Sewage
☐ Petroleum ☐ Chemical
☐ Fishy ☐ Other_____

Water Color
☐ Tannic ☐ Clear
☐ Green (Algae) ☐ Other Mod Turbid

Water Surface Oils
☐ Slick ☐ Sheen ☐ Globs ☐ Flecks
☒ None ☐ Other_____

Turbidity (visual measurement)
☐ Clear ☐ Slightly turbid ☒ Turbid
☐ Opaque ☐ Water color ☐ Other_____

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	5
Muck-Mud	black, very fine organic (FPOM)	95
Marl	grey, shell fragments	

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		0
Boulder	> 256 mm (10")	0
Cobble	64-256 mm (2.5" –10")	0
Gravel	2-64 mm (0.1"-2.5")	0
Sand	0.06-2mm (gritty)	0
Silt	0.004-0.006mm	75
Clay	<0.004mm (slick)	25

Comments: _____

In-situ and Grab Sample Water Chemistry Field Sheet

STREAM NAME: North Oconee Trib		**SITE # (ID):** BS-03	
LATITUDE (DD):		**LONGITUDE (DD):**	
LATITUDE (D,M,S):		**LONGITUDE (D,M,S):**	
INVESTIGATORS: SRC + T.Ng			
FORM COMPLETED BY: T.Ng	**DATE:** 3/8/17	**REASON FOR SURVEY:**	
PROJECT: Carpenter Technology	**TIME:** 1358 AM (PM)	RBP	

Depth Calibration for Water Quality Multiprobe				
Initial Reading	Adjust To	Temperature	Final Reading	Δ Initial to Final

In-situ Field Chemistry Data			
Unit used: YSI 650 MDS			
Water Temperature: 16.63	**° C**	**Depth (m):** 0.5H	
Specific Conductance: 0.054 ms/cm	**(µmhos/cm)**	**Salinity:**	
Dissolved Oxygen (mg/L): 5.53		**Dissolved Oxygen:** 57.5	**%**
pH: 6.23		**Air Temperature:** 20.6	**° C**
		ORP: 50.7	

In-situ Turbidity Measurement	
Unit used: YSI 650 MDS	
Turbidity: 16.6	**NTU**

Name of Lab to Send Grab Samples: NA	
Sample ID #: NA	**# of Bottles Collected:**

Parameters

Total Suspended Solids

Alkalinity

No preservative — **Half-Gallon bottle**

Clean Metals (ICP/MS) — **Preservative: HNO_3, <2 pH** — **500mL plastic bottle**

Metals blank collected at this site? Yes or No

Alkalinity — **No preservative** — **250 ml bottle**

Total Kjeldahl Nitrogen (TKN) — **Ammonia (NH_3)**

Nitrate-Nitrite (NO_2-NO_3) — **Total Organic Carbon (TOC)**

Preservative H_2SO_4, pH <2 — **250 ml bottle**

Ortho-phosphate — **Total Phosphorus**

Preservative H_2SO_4, pH <2 — **250 ml bottle**

Sampled by (signature):	Date/Time:	Team Leader/Received (signature):	Date/Time:

Date/Time Delivered to Name of Lab Here:	Date/Time Delivered or Sent to Name of Lab Here:

BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME: North Pearee		**SITE # (or ID#):** BS-03	
LATITUDE (DD):	**LONGITUDE (DD):**		
LATITUDE (D,M,S):	**LONGITUDE (D,M,S):**		
INVESTIGATORS: SRC + T.Ng			
FORM COMPLETED BY: T.Ng	**DATE** 3/8/17	**REASON FOR SURVEY:**	
PROJECT: Carpenter Technology	**TIME** 1400 AM (PM)	RBP	
Field Collector of Benthos: SRC + TNg	**Field Processor of Benthos:**		

HABITAT TYPES	**Indicate the percentage of each habitat type present** Riffles 2 % Snags 3 % Banks/ root mats 3 % Soft/Sandy sediment 90 % Leaf packs 2 % Submerged Macrophytes 0 %
SAMPLE COLLECTION	**Gear used**: D-frame, 500 µm net **How were the samples collected?** Wading **Indicate the number of jabs/kicks taken in each habitat type.** Riffles (fast)_____ Riffles (slow) 1 Snags_____ Banks/ root mats_____ Soft/Sandy sediment 2 Leaf packs_____ Submerged Macrophytes_____ Other ( )_____ **Total # of Jabs:** 3 **# of Jabs Reallocated (if any):**_____ **Total # of Bottles collected:**_____
GENERAL COMMENTS	Poor substrate, shallow water

QUALITATIVE LISTING OF AQUATIC BIOTA
Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare, 2 = Common, 3= Abundant, 4 = Dominant

Periphyton	(0)	1	2	3	4	Slimes	(0)	1	2	3	4
Filamentous Algae	(0)	1	2	3	4	Macroinvertebrates	0	(1)	2	3	4
Macrophytes	(0)	1	2	3	4	Fish	0	(1)	2	3	4

FIELD OBSERVATIONS OF MACROBENTHOS
Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare (1-3 organisms), 2 = Common (3-9 organisms), 3= Abundant (>10 organisms), 4 = Dominant (>50 organisms)

Porifera	0	1	2	3	4	Anisoptera	0	1	2	3	4	Trichoptera	0	1	2	3	4
Hydrozoa	0	1	2	3	4	Zygoptera	0	1	2	3	4	Plecoptera	0	1	2	3	4
Platyhelminthes	0	1	2	3	4	Hemiptera	0	1	2	3	4	Megaloptera	0	1	2	3	4
Turbellaria	0	1	2	3	4	Coleoptera	0	1	2	3	4	Sialidae	0	1	2	3	4
Hirudinea	0	1	2	3	4	Lepidoptera	0	1	2	3	4	Corydalidae	0	1	2	3	4
Oligochaeta	0	1	2	3	4	Tipulidae	0	1	2	3	4	Other	0	1	2	3	4
Isopoda	0	1	2	3	4	Empididae	0	1	2	3	4	Daphnia	0	(1)	2	3	4
Amphipoda	0	(1)	2	3	4	Simuliidae	0	1	2	3	4						
Decapoda	0	1	2	3	4	Tabanidae	0	1	2	3	4						
Gastropoda	0	1	2	3	4	Culicidae	0	1	2	3	4						
Bivalvia	0	1	2	3	4	Chironomidae	0	1	(2)	3	4						
						Ephemeroptera	0	1	2	(3)	4						

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME: Unnamed Stream		SITE (or ID) #: BS-04	
LAT (DD):	LONG (DD):		
LAT (D,M,S):	LONG (D,M,S):		
INVESTIGATORS: SRC / TCNy	FORM COMPLETED BY: SRC		
PROJECT: Carpenter Technology	DATE 3/8/17 TIME 1430 AM (PM)	REASON FOR SURVEY: RBP	
FIELD SEASON: Late Winter	COMMENTS: Very mucky; 2 jabs in large leadpacks		

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	(10) 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE	20 19 18 17 16	15 14 13 12 11	10 (9) 8 7 6	5 4 3 2 1 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 (4) 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 (7) 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 (17) 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET – LOW GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 (19) 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 (8) 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 (4) 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 (3)	2 1 0
9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 (3)	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	(5) 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE ___ (LB)	Left Bank (10) 9	8 7 6	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank (10) 9	8 7 6	5 4 3	2 1 0

Total Score 109

Physical Characterization and Water Quality Field Data Sheet (Front)

STREAM NAME: North Oconee Trib		**SITE # (ID):** BS-04	
LATITUDE (DD):		**LONGITUDE (DD):**	
LATITUDE (D,M,S):		**LONGITUDE (D,M,S):**	
INVESTIGATORS: SRC / TNg			
FORM COMPLETED BY: SRC		**DATE:** 3/8/17	**REASON FOR SURVEY:**
PROJECT: Carpenter Technologies		**TIME:** 1435 AM (PM)	RBP

SITE LOCATION/MAP	**Draw a map of the site and indicate the areas sampled:** See Figure 2.		
STREAM CHARACTERIZATION	**Subsystem Classification** ☐ Perennial ☒ Intermittent ☐ Tidal		**Stream Type (mark one from each group)** ☐ Coldwater ☒ Warmwater
	Stream Origin ☒ Other Natural SW watershed ☐ Swamp & Bog ☐ Spring Fed ☐ Unsure		☐ Clearwater ☐ Blackwater
WEATHER CONDITIONS	**Now**	**Past 24 hours**	☐ storm (heavy rain) ☐ ☒ rain (steady rain) ☐ ☐ showers (intermittent) ☐ ____% ☐ ____%cloud cover ☒ ☐ clear/sunny
	Has there been a heavy rain in the last 7 days? ☒ Yes ☐ No		**Air Temperature** 20 °C **Other**_____

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

RIPARIAN ZONE/ INSTREAM FEATURES

Predominant Surrounding Land Use
- [X] Forest
- [ ] Pasture
- [ ] Agricultural
- [ ] Residential
- [ ] Clear Cut
- [ ] Livestock
- [ ] Commercial
- [ ] Industrial
- [ ] Planted Pine (Silviculltural)
- [ ] Cropland
- [ ] Other

Local Watershed NPS Pollution
- [ ] No evidence
- [X] Some potential sources
- [ ] Obvious sources
- [ ] _____

Canopy Cover
- [ ] Open (0-10%)
- [ ] Partly open (11-45%)
- [X] Partly shaded (46-80%)
- [ ] Shaded (81-100%)

Local Water Erosion
- [ ] None
- [X] Moderate
- [ ] Heavy

BEAVER ACTIVITY BASED ON OBSERVATIONS:
- [ ] Active Beaver Dam Affecting Stream
- [ ] Inactive Beaver Dam Affecting Stream
- [ ] Active Beaver Dam/Cutting Evident But Little Effect
- [ ] Old Beaver Dam/ Activity, Little Effect
- [ ] Inactive Beaver Dam, Little Effect on Stream
- [X] No Beaver Activity Evident

LIVESTOCK DAMAGE BASED ON OBSERVATIONS:
- [X] No Livestock Damage (Deer runs)
- [ ] Stable (0-25% Damage, Little/No Erosion)
- [ ] Moderate (25-50%) Damage, < 50% Plant Biomass Remains)
- [ ] High (51-75 % Damage, <25% Plant Biomass Remains)
- [ ] Severe (76-100% Damage, Little/No Plant Biomass Remains)

High Water Mark 0.75 m
Estimated Stream Width 2-4 m
Estimated Stream Depth
- [ ] Riffle _____ m
- [ ] Run _____ m
- [X] Pool 0.25 m

Reach Morphological Types (% in reach):
- [ ] Riffle _____ m
- [X] Run 20% m
- [X] Pool 80% m

Average Surface Velocity _____ m/sec (at thalweg)
Estimated Reach Length 100m
Channelized? [ ] Yes [X] No [ ] Full [ ] Partial
Dredging? [ ] Yes [X] No
Dam Present? [ ] Yes [X] No
If Present: [ ] Upstream [ ] Downstream [ ] In Reach

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present:
- [X] Trees
- [ ] Shrubs
- [ ] Grasses
- [ ] Herbaceous

dominant species present: _____

Check one that best applies:
- [ ] Brush – dominated by alders, willows, et.
- [X] Forested – dominated by tress with brushy understory
- [ ] Grass- bank covered with tall grasses, sedges, etc.
- [X] Exposed – bare rock, soil, rock, etc.

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
- [ ] Rooted emergent
- [ ] Rooted submergent
- [ ] Rooted floating
- [ ] Free Floating
- [ ] Floating Algae
- [ ] Attached Algae

dominant species present N/A

Portion of the reach with vegetative cover _____ %

SEDIMENT/ SUBSTRATE

Odors
- [X] Normal
- [ ] Sewage
- [ ] Chemical
- [ ] Anaerobic
- [ ] Other

Deposits
- [ ] Petroleum
- [ ] Sludge
- [ ] Sawdust
- [ ] Paper fiber
- [ ] Sand
- [X] None
- [ ] Relict shells
- [ ] Other

Oils
- [X] Absent
- [ ] Slight
- [ ] Moderate
- [ ] Profuse

Looking at stones which are not deeply embedded, are the undersides black in color?
- [ ] Yes
- [X] No

WATER QUALITY

Water Odors
- [X] Normal/None
- [ ] Sewage
- [ ] Petroleum
- [ ] Chemical
- [ ] Fishy
- [ ] Other

Water Color
- [ ] Tannic
- [X] Clear
- [ ] Green (Algae)
- [ ] Other _____

Water Surface Oils
- [ ] Slick
- [ ] Sheen
- [ ] Globs
- [ ] Flecks
- [X] None
- [ ] Other

Turbidity (visual measurement)
- [ ] Clear
- [X] Slightly turbid
- [ ] Turbid
- [ ] Opaque
- [ ] Water color
- [ ] Other

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	10%
Muck-Mud	black, very fine organic (FPOM)	90%
Marl	grey, shell fragments	

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5" –10")	
Gravel	2-64 mm (0.1"-2.5")	
Sand	0.06-2mm (gritty)	
Silt	0.004-0.006mm	50%
Clay	<0.004mm (slick)	50%

Comments: _____

In-situ and Grab Sample Water Chemistry Field Sheet

STREAM NAME: North Oconee Trib		**SITE # (ID):** BS-04	
LATITUDE (DD):		**LONGITUDE (DD):**	
LATITUDE (D,M,S):		**LONGITUDE (D,M,S):**	
INVESTIGATORS: SRC / TNg			
FORM COMPLETED BY: TNg	**DATE:** 3/8/15	**REASON FOR SURVEY:**	
PROJECT: Carpenter Technology	**TIME:** 1445 AM (PM)	RBP	

Depth Calibration for Water Quality Multiprobe				
Initial Reading	Adjust To	Temperature	Final Reading	Δ Initial to Final

In-situ Field Chemistry Data			
Unit used: YSI 650 MDS			
Water Temperature: 18.51	**° C**	**Depth (m):**	
Specific Conductance: 0.057 ms/cm	**(µmhos/cm)**	**Salinity:**	
Dissolved Oxygen (mg/L): 9.0		**Dissolved Oxygen:** 96.0	**%**
pH: 6.5		**Air Temperature:** 20.6	**° C**
		ORP: 125.4	

In-situ Turbidity Measurement		
Unit used: 11		
Turbidity: 13.4	**NTU**	

Name of Lab to Send Grab Samples: NA		
Sample ID #: NA	**# of Bottles Collected:**	
Parameters		
Total Suspended Solids		
Alkalinity		
No preservative		**Half-Gallon bottle**
Clean Metals (ICP/MS)	**Preservative: HNO_3, <2 pH**	**500mL plastic bottle**
Metals blank collected at this site? Yes or No		
Alkalinity **No preservative**	**250 ml bottle**	
Total Kjeldahl Nitrogen (TKN)	**Ammonia (NH_3)**	
Nitrate-Nitrite (NO_2-NO_3)	**Total Organic Carbon (TOC)**	
Preservative H_2SO_4, pH <2	**250 ml bottle**	
Ortho-phosphate	**Total Phosphorus**	
Preservative H_2SO_4, pH <2	**250 ml bottle**	

Sampled by (signature):	Date/Time:	Team Leader/Received (signature):	Date/Time:

Date/Time Delivered to Name of Lab Here:	Date/Time Delivered or Sent to Name of Lab Here:

BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME: Un-named Tributary		**SITE # (or ID#):** BS-04	
LATITUDE (DD):	**LONGITUDE (DD):**		
LATITUDE (D,M,S):	**LONGITUDE (D,M,S):**		
INVESTIGATORS:			
FORM COMPLETED BY: SRC	**DATE** 3/8/17 **TIME** 1445 **AM PM**	**REASON FOR SURVEY:** RBP	
PROJECT:			
Field Collector of Benthos: T. Ng	**Field Processor of Benthos:** T. Ng		

HABITAT TYPES	**Indicate the percentage of each habitat type present** Riffles _____% Snags_____% Banks/ root mats_____ % Soft/Sandy sediment_____% Leaf packs 100 % Submerged Macrophytes_____ %
SAMPLE COLLECTION	**Gear used:** D-frame, 500 µm net **How were the samples collected?** Wading **Indicate the number of jabs/kicks taken in each habitat type.** Riffles (fast)_____ Riffles (slow)_____ Snags_____ Banks/ root mats_____ Soft/Sandy sediment_____ Leaf packs 2 Submerged Macrophytes_____ Other ( )_____ **Total # of Jabs:** 2 **# of Jabs Reallocated (if any):**_____ **Total # of Bottles collected:**_____
GENERAL COMMENTS	Very mucky, no applicable habitat except for leaf packs on bottom.

QUALITATIVE LISTING OF AQUATIC BIOTA
Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare, 2 = Common, 3= Abundant, 4 = Dominant

Periphyton	0	(1)	2	3	4	Slimes	(0)	1	2	3	4
Filamentous Algae	(0)	1	2	3	4	Macroinvertebrates	0	(1)	2	3	4
Macrophytes	0	(1)	2	3	4	Fish	0	(1)	2	3	4

FIELD OBSERVATIONS OF MACROBENTHOS
Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare (1-3 organisms), 2 = Common (3-9 organisms), 3= Abundant (>10 organisms), 4 = Dominant (>50 organisms)

Porifera	0	1	2	3	4	Anisoptera	0	1	2	3	4	Trichoptera	0	1	2	3	4
Hydrozoa	0	1	2	3	4	Zygoptera	0	1	2	3	4	Plecoptera	0	1	2	3	4
Platyhelminthes	0	1	2	3	4	Hemiptera	0	1	2	3	4	Megaloptera	0	1	2	3	4
Turbellaria	0	1	2	3	4	Coleoptera	0	(1)	2	3	4	Sialidae	0	1	2	3	4
Hirudinea	0	1	2	3	4	Lepidoptera	0	1	2	3	4	Corydalidae	0	1	2	3	4
Oligochaeta	0	(1)	2	3	4	Tipulidae	0	1	2	3	4	Other	0	1	2	3	4
Isopoda	0	1	2	3	4	Empididae	0	1	2	3	4						
Amphipoda	0	1	2	3	(4)	Simuliidae	0	1	2	3	4						
Decapoda	0	1	(2)	3	4	Tabanidae	0	1	2	3	4						
Gastropoda	0	1	2	3	4	Culicidae	0	1	2	3	4						
Bivalvia	0	1	2	3	4	Chironomidae	0	1	(2)	3	4						
						Ephemeroptera	0	(1)	2	3	4						

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME: Tributary off North Oconee		**SITE (or ID) #:** BS-05	
LAT (DD):		**LONG (DD):**	
LAT (D,M,S):		**LONG (D,M,S):**	
INVESTIGATORS: SRC / T.Ng		**FORM COMPLETED BY:** TNg	
PROJECT: Carpenter Technology	**DATE** 3/8/17 **TIME** 1505 AM (PM)	**REASON FOR SURVEY:** RBP	
FIELD SEASON: Late winter (March)	**COMMENTS:** Within power easement		

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	(10) 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE	20 19 18 17 16	15 14 13 (12) 11	10 9 8 7 6	5 4 3 2 1 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 (8) 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 (3) 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 (8) 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET – LOW GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	(15) 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 (8) 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 (3)	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 (4) 3	2 1 0
9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE ___ (LB)	Left Bank 10 9	8 (7) 6	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 (7) 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE ___ (LB)	Left Bank 10 9	8 7 (6)	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 (6)	5 4 3	2 1 0

Total Score 97

Physical Characterization and Water Quality Field Data Sheet (Front)

STREAM NAME: Tributary off N. Ocoee		**SITE # (ID):** BS-05	
LATITUDE (DD):		**LONGITUDE (DD):**	
LATITUDE (D,M,S):		**LONGITUDE (D,M,S):**	
INVESTIGATORS: SRC / T.Ng			
FORM COMPLETED BY: T.Ng	**DATE:** 3/8/17	**REASON FOR SURVEY:** RBP	
PROJECT: Carpenter Technology	**TIME:** 1505 AM (PM)		

SITE LOCATION/MAP	**Draw a map of the site and indicate the areas sampled:** See Figure 2

STREAM CHARACTERIZATION	**Subsystem Classification** ☐ Perennial ☒ Intermittent ☐ Tidal **Stream Origin** ☐ Other 80% permitted Ind. effluent ☐ Swamp & Bog ☐ Spring Fed ☐ Unsure	**Stream Type (mark one from each group)** ☐ Coldwater ☒ Warmwater ☐ Clearwater ☐ Blackwater
WEATHER CONDITIONS	**Now** / **Past 24 hours** ☐ ☐ storm (heavy rain) ☐ ☒ rain (steady rain) ☐ ☐ showers (intermittent) ☐ ____% ☐ ____%cloud cover ☒ ☐ clear/sunny	**Has there been a heavy rain in the last 7 days?** ☒ Yes ☐ No **Air Temperature** 20 °C **Other** _____

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

RIPARIAN ZONE/ INSTREAM FEATURES

Predominant Surrounding Land Use
☐ Forest ☐ Commercial
☐ Pasture ☐ Industrial
☐ Agricultural ☐ Planted Pine (Silviculltural)
☐ Residential ☐ Cropland_____
☒ Clear Cut ☐ Other_____
☐ Livestock_____

Local Watershed NPS Pollution
☒ No evidence ☐ Some potential sources
☐ Obvious sources ☐ _____

Canopy Cover
☒ Open (0-10%) ☐ Partly open (11-45%)
☐ Partly shaded (46-80%) ☐ Shaded (81-100%)

Local Water Erosion
☐ None ☐ Moderate ☒ Heavy

BEAVER ACTIVITY BASED ON OBSERVATIONS:
☐ Active Beaver Dam Affecting Stream
☐ Inactive Beaver Dam Affecting Stream
☐ Active Beaver Dam/Cutting Evident But Little Effect
☐ Old Beaver Dam/ Activity, Little Effect
☐ Inactive Beaver Dam, Little Effect on Stream
☒ No Beaver Activity Evident

LIVESTOCK DAMAGE BASED ON OBSERVATIONS:
☒ No Livestock Damage
☐ Stable (0-25% Damage, Little/No Erosion)
☐ Moderate (25-50%) Damage, < 50% Plant Biomass Remains)
☐ High (51-75 % Damage, <25% Plant Biomass Remains)
☐ Severe (76-100% Damage, Little/No Plant Biomass Remains)

High Water Mark 2 m
Estimated Stream Width 0.5-2 m
Estimated Stream Depth
☐ Riffle 0.2 m ☐ Run 0.2 m
☐ Pool _____ m
Reach Morphological Types (% in reach):
☐ Riffle 5 m ☐ Run 70 %
☐ Pool 25 m
Average Surface Velocity < 0.5 m/sec (at thalweg)
Estimated Reach Length 100m
Channelized? ☐ Yes ☐ No ☐ Full ☐ Partial
Dredging? ☐ Yes ☒ No

Dam Present? ☐ Yes ☒ No
If Present: ☐ Upstream ☐ Downstream ☐ In Reach

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present:
☐ Trees ☐ Shrubs ☒ Grasses ☐ Herbaceous
dominant species present: Reeds

Check one that best applies:
☐ Brush – dominated by alders, willows, et.
☐ Forested – dominated by tress with brushy understory
☒ Grass- bank covered with tall grasses, sedges, etc.
☐ Exposed – bare rock, soil, rock, etc.

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
☒ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free Floating
☐ Floating Algae ☐ Attached Algae

dominant species present _____

Portion of the reach with vegetative cover 5 %

SEDIMENT/ SUBSTRATE

Odors
☒ Normal ☐ Sewage
☐ Chemical ☐ Anaerobic
☐ Other_____

Deposits
☐ Petroleum ☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand
☐ None ☐ Relict shells ☐ Other_____

Oils
☒ Absent ☐ Slight ☐ Moderate ☐ Profuse

Looking at stones which are not deeply embedded, are the undersides black in color?
☐ Yes ☒ No

WATER QUALITY

Water Odors
☒ Normal/None ☐ Sewage
☐ Petroleum ☐ Chemical
☐ Fishy ☐ Other_____

Water Color
☐ Tannic ☐ Clear
☐ Green (Algae) ☒ Other Slightly Turbid

Water Surface Oils
☐ Slick ☐ Sheen ☐ Globs ☐ Flecks
☐ None ☐ Other_____

Turbidity (visual measurement)
☐ Clear ☒ Slightly turbid ☐ Turbid
☐ Opaque ☐ Water color ☐ Other_____

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	20
Muck-Mud	black, very fine organic (FPOM)	80
Marl	grey, shell fragments	0

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		0
Boulder	> 256 mm (10")	0
Cobble	64-256 mm (2.5" –10")	0
Gravel	2-64 mm (0.1"-2.5")	0
Sand	0.06-2mm (gritty)	5
Silt	0.004-0.006mm	85
Clay	<0.004mm (slick)	10

Comments: _____

In-situ and Grab Sample Water Chemistry Field Sheet

STREAM NAME: Tributary off N. Oconee		**SITE # (ID):** BS-05	
LATITUDE (DD):		**LONGITUDE (DD):**	
LATITUDE (D,M,S):		**LONGITUDE (D,M,S):**	
INVESTIGATORS: SRC / T.Ng			
FORM COMPLETED BY: T.Ng	**DATE:** 3/5/15	**REASON FOR SURVEY:**	
PROJECT: Carpenter Technology	**TIME:** 15:10 AM PM	RBP	

Depth Calibration for Water Quality Multiprobe				
Initial Reading	Adjust To	Temperature	Final Reading	Δ Initial to Final

In-situ Field Chemistry Data			
Unit used: YSI 650 MDS			
Water Temperature: 17.88 ° C		**Depth (m):** < 6 m	
Specific Conductance: 0.062 ms/cm (µmhos/cm)		**Salinity:**	
Dissolved Oxygen (mg/L): 6.93		**Dissolved Oxygen:** 73.1	%
pH: 6.54		**Air Temperature:**	° C
		ORP: 89	

In-situ Turbidity Measurement		
Unit used: //		
Turbidity: 15.7	**NTU**	

Name of Lab to Send Grab Samples: NA		
Sample ID #: NA	**# of Bottles Collected:**	
Parameters		
Total Suspended Solids		
Alkalinity		
No preservative		**Half-Gallon bottle**
Clean Metals (ICP/MS)	**Preservative: HNO_3, <2 pH**	**500mL plastic bottle**
Metals blank collected at this site? Yes or No		
Alkalinity **No preservative**	**250 ml bottle**	
Total Kjeldahl Nitrogen (TKN)	**Ammonia (NH_3)**	
Nitrate-Nitrite (NO_2-NO_3)	**Total Organic Carbon (TOC)**	
Preservative H_2SO_4, pH <2	**250 ml bottle**	
Ortho-phosphate	**Total Phosphorus**	
Preservative H_2SO_4, pH <2	**250 ml bottle**	

Sampled by (signature):	Date/Time:	Team Leader/Received (signature):	Date/Time:

Date/Time Delivered to Name of Lab Here:	Date/Time Delivered or Sent to Name of Lab Here:

BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME: Tributary off N. Oconee		**SITE # (or ID#):** BS-05
LATITUDE (DD):	**LONGITUDE (DD):**	
LATITUDE (D,M,S):	**LONGITUDE (D,M,S):**	
INVESTIGATORS:		
FORM COMPLETED BY:	**DATE** _____ **TIME**_____ **AM PM**	**REASON FOR SURVEY:**
PROJECT:		
Field Collector of Benthos:	**Field Processor of Benthos:**	

HABITAT TYPES	**Indicate the percentage of each habitat type present** Riffles _____% Snags_____% Banks/ root mats_____ % Soft/Sandy sediment_____% Leaf packs_____ % Submerged Macrophytes_____ %
SAMPLE COLLECTION	**Gear used:** D-frame, 500 µm net **How were the samples collected?** Wading **Indicate the number of jabs/kicks taken in each habitat type.** Riffles (fast)_____ Riffles (slow)_____ Snags_____ Banks/ root mats_____ Soft/Sandy sediment_____ Leaf packs_____ Submerged Macrophytes_____ Other ( )_____ **Total # of Jabs:**_____ **# of Jabs Reallocated (if any):**_____ **Total # of Bottles collected:**_____
GENERAL COMMENTS	Not enough discharge to collect a representative sample.

QUALITATIVE LISTING OF AQUATIC BIOTA
Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare, 2 = Common, 3= Abundant, 4 = Dominant

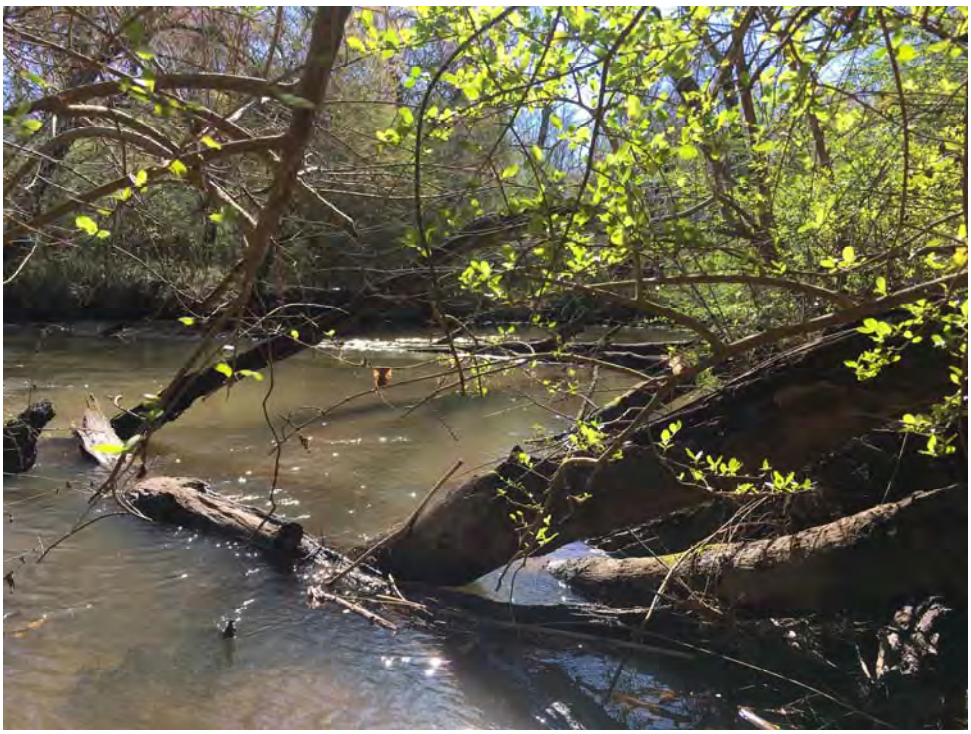
Periphyton	0	1	2	3	4	Slimes	0	1	2	3	4
Filamentous Algae	0	1	2	3	4	Macroinvertebrates	0	1	2	3	4
Macrophytes	0	1	2	3	4	Fish	0	1	2	3	4

FIELD OBSERVATIONS OF MACROBENTHOS
Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare (1-3 organisms), 2 = Common (3-9 organisms), 3= Abundant (>10 organisms), 4 = Dominant (>50 organisms)

Porifera	0	1	2	3	4	Anisoptera	0	1	2	3	4	Trichoptera	0	1	2	3	4
Hydrozoa	0	1	2	3	4	Zygoptera	0	1	2	3	4	Plecoptera	0	1	2	3	4
Platyhelminthes	0	1	2	3	4	Hemiptera	0	1	2	3	4	Megaloptera	0	1	2	3	4
Turbellaria	0	1	2	3	4	Coleoptera	0	1	2	3	4	Sialidae	0	1	2	3	4
Hirudinea	0	1	2	3	4	Lepidoptera	0	1	2	3	4	Corydalidae	0	1	2	3	4
Oligochaeta	0	1	2	3	4	Tipulidae	0	1	2	3	4	Other	0	1	2	3	4
Isopoda	0	1	2	3	4	Empididae	0	1	2	3	4						
Amphipoda	0	1	2	3	4	Simuliidae	0	1	2	3	4						
Decapoda	0	1	2	3	4	Tabanidae	0	1	2	3	4						
Gastropoda	0	1	2	3	4	Culicidae	0	1	2	3	4						
Bivalvia	0	1	2	3	4	Chironomidae	0	1	2	3	4						
						Ephemeroptera	0	1	2	3	4						

ATTACHMENT B

PHOTO LOG



Photograph 1. Station BS-01 (view south from access point), located downstream from discharge point of Unnamed Stream into the North Oconee River. First sample was obtained from snag seen in photograph using a D-frame kick net.

Photograph 2. Station BS-01 (view looking north from access point), located downstream from discharge point of Unnamed Stream into the North Oconee River. Second sample consisted of a small snag and leaf pack located upstream from access point.

Photograph 3. Station BS-01, a larva of a mayfly from the Family Ephemeroptera (Siphlonuridae spp.) was sorted from the D-net sample.

Photograph 4. Station BS-01, a clam from the Family Sphaeriidae was observed on the sediment near the bank.

Photograph 5. Station BS-02 (view looking downstream from station). BS-02 was located upstream of discharge point of Unnamed Stream into the North Oconee River.

Photograph 6. Station BS-02 (view looking upstream from station). BS-02 was located upstream of discharge point of Unnamed Stream into the North Oconee River. A sample was collected from the half-submerged tree in the middle ground of the photo.

Photograph 7. Station BS-02, a larva of a very sensitive stonefly from the Perlidae family (Agnetina spp.) was sorted from the D-net sample.

Photograph 8. Station BS-02, a caddisfly larva from the family Leptoceridae was sorted from the D-net sample.

Photograph 9. Station BS-02, a crayfish (Cambarus spp.) was sorted from the D-net sample.

Photograph 10. Station BS-03 (view looking upstream of Unnamed Stream), just west of discharge point of Unnamed Stream into the North Oconee River.

Photograph 11. Station BS-03 (view looking downstream of Unnamed Stream). The discharge point of Unnamed Stream into the North Oconee River can be seen in the background (arrow).

Photograph 12. Station BS-03, biological sample was obtained from substrate bottom and small riffle. Substrate was observed to be poor and water was shallow.

Photograph 13. Station BS-04 (view looking west i.e. upstream of Unnamed Stream). This station was located about 100' west of BS-03.

Photograph 14. Station BS-04 (view looking east i.e. downstream of Unnamed Stream), substrate was observed to be very mucky. Samples were obtained from leaf packs.

Photograph 15. Station BS-05 (view looking east i.e. downstream of Unnamed Stream), located within the power easement. Heavy sedimentation, due to storm events, was observed. Water was too shallow to obtain macroinvertebrate sample.

Photograph 16. Slightly upstream of Station BS-05 (view looking west i.e. upstream of Unnamed Stream); note the deeply incised channel due to heavy erosion during storm events.

Photograph 17. View (looking upstream) of the culvert where the Unnamed Stream discharges off of the Champion Dairy Pak property.

Photograph 18. View of the apparent origin of the Unnamed Stream located adjacent to (northeast) of the Site. The source of this headwater stream is not known but some of the discharge is most likely from suburban runoff.

Photograph 19. Composite photograph showing a portion of the Unnamed Wetland located west of BS-02 (slightly upstream of confluence of the Unnamed Stream with North Oconee River). Note the termite mound to the right of the photograph.

Photograph 20. Composite photograph showing a portion of the Unnamed Wetland located west of BS-02 (slightly upstream of confluence of the Unnamed Stream with North Oconee River). This portion of the wetland is partially fed by a braided tributary of the Unnamed Stream.

APPENDIX E

Labor Summary

APPENDIX E

LABOR SUMMARY

GENERAL TIME CORPORATION - ATHENS, GA

VOLUNTARY REMEDIATION PROGRAM (HIS# 10355)

Month-Year	Type Service	Hours	Description
October-16	PE/PM	24	Project Management
	Support	90	Report Preparation
	Senior Geologist	3	Project Coordination
November-16	PE/PM	1.5	Project Management
	Senior Geologist	0.25	Project Coordination
December-16	PE/PM	0.5	Project Management
	Support	11	Technical
	Senior Geologist	0.25	Project Coordination
January-17	PE/PM	6	Project Management
	Senior Geologist	2	Project Coordination
	Support	17.25	Technical
February-17	PE/PM	21	Project Management
	Support	21	Sample Collection
	Senior Geologist	6	Project Coordination
	Support	21	Sample Collection
March-17	PE/PM	39.5	Project Management
	Senior Geologist	1	Project Coordination
	Support	143.75	Sample Collection/Report Preparation