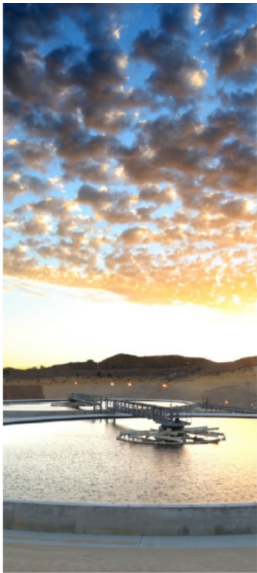




Final



Quarterly Report

October through December 2016

Penta Wood Products Superfund Site

Wisconsin Department of Natural Resources



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1. Introduction

GHD Services Inc. (GHD) prepared this Quarterly Report (Report) for the Penta Woods Products Superfund Site (Site) in Siren, Wisconsin on behalf of Wisconsin Department of Natural Resources (WDNR). The Site location is shown on Figure 1.1, and the Site plan is shown on Figure 1.2. This Report presents the results of the activities conducted at the Site during October through December 2016 including:

- Groundwater monitoring and sampling (Section 2)
- Residential well sampling (Section 3)
- Microcosm study (Section 4)
- Bio-trap study (Section 5)
- Microcosm and bio-trap study conclusions and recommendations (Section 6)
- Waste management and disposal (Section 7)
- Continuing Obligations and Inspections (Section 8)
- Recommendations (Section 9)
- Certification (Section 10)

2. Groundwater Monitoring and Sampling

Groundwater monitoring and sampling was conducted at the Site in October 2016 based on the modified scope of work provided in a GHD letter to EPA dated June 30, 2016. Sampling was completed in general accordance with the Field Sampling Plan (FSP) (CH2M HILL, November 1999 and November 2010) and Quality Assurance Project Plan (QAPP) (CH2M HILL, February 2005) with subsequent addendums (most recent is Addendum No. 6 dated July 2014). The primary purpose of the baseline event was to confirm the dissolved plume size and extent and the concentration distribution at the Site after operation of the remediation system. The objectives of the groundwater monitoring at the Site included:

- To monitor flow direction and hydraulic gradient through the measurement and assessment of groundwater levels
- To monitor the natural attenuation of the plume through collection and chemical analysis of groundwater samples from monitoring wells
- To monitor long term improvement in groundwater quality through the collection and chemical analysis of groundwater samples from monitoring wells
- To monitor compliance with groundwater cleanup standards for the Site (State of Wisconsin ch. NR 140 Enforcement Standards)
- To monitor potential impact to residential wells through collection and chemical analysis of water samples from targeted residential wells



2.1 Groundwater and LNAPL Level Monitoring

Groundwater and Light Non-Aqueous Phase Liquid (LNAPL) levels were measured in thirty-three (33) monitoring wells and twenty-two (22) extraction well casings at the Site on October 7, 2016. The groundwater and LNAPL elevation data along with recent well survey data are summarized in Table 2.1. Historical LNAPL thickness data are included in Appendix A.

Groundwater elevation contours were inferred from the October 7, 2016 measurement data. Unconfined aquifer (upper portion) contours are shown on Figure 2.1. Semiconfined aquifer (lower portion) groundwater contours are shown on Figure 2.2. The contours indicate that the groundwater gradient is relatively flat at less than 0.0007 ft/ft (as calculated between wells MW6S and MW26) and represent non-pumping conditions following shutdown of the remediation system and groundwater extraction pumps (November 2015).

Historically, LNAPL has been present in measurable quantities in four monitoring wells (MW10S, MW18, MW19, and MW20). During the October 2016 event, LNAPL was present in monitoring wells MW18, MW19, and MW20 at measurable thicknesses, and LNAPL was not present in well MW10S. LNAPL was present in six extraction wells (EW05S, EW06S, EW07S, EW10S, EW12S, and EW14S) with casings screened in the unconfined (upper) aquifer during the October 2016 monitoring event. This is consistent with previous monitoring. LNAPL was not observed in any monitoring wells with casings screened in the semiconfined (lower) aquifer during October 2016. LNAPL thickness measurements are shown on Figure 2.3.

During April 2016, LNAPL was present in one extraction well (EW06D) with a casing screened in the semiconfined (lower) aquifer. Groundwater and LNAPL levels were not previously measured in the extraction wells screened in the semiconfined (lower) aquifer since the casings were not accessible due to the presence of the submersible pumps and piping. An absorbent sock was installed in the well casing to recover the LNAPL and confirm whether LNAPL re-enters the well without pumping. The absorbent sock was removed from the well in May 2016. LNAPL was not observed in well EW06D during July 2016. LNAPL was observed in well EW06D during October 2016. An absorbent sock was re-installed in the well and will continue to be monitored for the presence of LNAPL.

2.1.1 Vertical Gradients

Vertical hydraulic gradients were calculated between the semiconfined and unconfined aquifers to evaluate vertical flow between the two aquifers. The vertical gradient was calculated at monitoring wells MW10/MW10S, MW12/MW16, and MW23/MW9 (see Figures 2.1 and 2.2). The vertical gradient was determined by taking the difference in groundwater elevations divided by the difference in mid screen elevations of the wells listed above.

Groundwater at the Site flows from the unconfined aquifer downward to the semiconfined aquifer. The vertical gradients at the site range from 0.006 ft/ft (MW10/MW10S) to 0.019 ft/ft (MW12/MW16). As expected, these values are less than historical values since groundwater elevations are not influenced by groundwater extraction from the semiconfined aquifer.



2.2 Groundwater Sampling

This groundwater sampling event was conducted from October 10 through 14, 2016 and consisted of collecting groundwater samples from seventeen (17) monitoring wells (MW1, MW3, MW6S, MW10, MW10S, MW12, MW13, MW16, MW17, MW21, MW22, MW23, MW25, MW28, MW29, MW30, and MW31) and three (3) extraction wells (EW11D, EW11S, and EW13S). Wells MW20, EW06D, EW07S were not sampled due to the presence of LNAPL in the wells. Groundwater samples were collected using low flow purge and sample protocol. As part of the well stabilization process, the groundwater was measured in the field for the following parameters: pH, temperature, specific conductance, dissolved oxygen (DO), oxidation-reduction potential (ORP), iron, and sulfide. The parameters DO, ORP, iron and sulfide are used to help evaluate the groundwater geochemical conditions at the well. The groundwater purging and sampling data are summarized in Table 2.2.

The groundwater samples were collected and analyzed for the following compounds: pentachlorophenol (PCP); naphthalene; benzene, toluene, ethylbenzene, and xylene (BTEX); natural attenuation parameters; and select dissolved metals. The natural attenuation parameters included alkalinity, chloride, hardness, nitrate, sulfate, total organic carbon, and methane. The results of the natural attenuation parameters were evaluated to confirm the groundwater reduction-oxidation conditions at the Site and if the groundwater conditions are favorable for biodegradation. The select dissolved metals included arsenic, copper, iron, manganese, and zinc. The metals samples were filtered in the field through a 0.54 micron filter. The groundwater sample analytical data are summarized in Table 2.3.

All groundwater samples were shipped via commercial courier under standard chain of custody procedures to TestAmerica Laboratories (TestAmerica) in North Canton, Ohio for analysis. Copies of laboratory reports are included in Appendix B.

The following sections present a discussion of the groundwater sample analytical data and the Wisconsin Chapter NR140 preventative action limits (PAL) and enforcement standards (ES). Historical data are included in Appendix A.

2.2.1 Naphthalene and BTEX Analytical Data

The October 2016 naphthalene and BTEX analytical data are summarized in Table 2.3. Naphthalene was detected in one monitoring well (MW29) at a concentration that exceeded the PAL of 10 micrograms per liter ($\mu\text{g/L}$) (Table 2.3). Naphthalene concentrations did not exceed the ES of 100 $\mu\text{g/L}$.

BTEX was not detected at concentrations that exceeded the ESs or PALs.

2.2.2 PCP Analytical Data

The October 2016 PCP analytical data are summarized in Table 2.3. PCP was detected in seventeen wells (MW1, MW3, MW6S, MW10, MW10S, MW12, MW13, MW16, MW21, MW25, MW28, MW29, MW30, MW31, EW11D/S, and EW13S) at concentrations exceeding the PAL of 0.1 $\mu\text{g/L}$. Of those seventeen wells, the PCP concentrations in ten wells (MW10, MW10S, MW12, MW21, MW28, MW29, MW30, MW31, EW11D, and EW13S) exceeded the ES of 1.0 $\mu\text{g/L}$.



Figure 2.4 shows the PCP concentrations in the unconfined (upper) aquifer wells. Figure 2.5 shows the PCP concentrations in the semiconfined (lower) aquifer wells.

Based on a review of the October 2016 analytical data, it appears that the elevated PCP concentrations (i.e., greater than 1,000 µg/L) are limited to the immediate vicinity of the LNAPL area in the unconfined and semiconfined aquifers, which is consistent with baseline sampling in April 2016.

The extent of PCP concentrations exceeding the ES (1 µg/L) is not currently delineated to the north, south, and east with the existing monitoring well network in the unconfined (upper) aquifer and to the east and southeast with the existing network in the semiconfined (lower) aquifer. Additional monitoring is recommended to determine if additional wells and/or actions are necessary.

2.2.3 Dissolved Arsenic Analytical Data

The October 2016 dissolved arsenic analytical data are summarized in Table 2.3. Arsenic was detected in one well (EW13S) at concentrations exceeding the PAL (1 µg/L) and the ES (10 µg/L). Figure 2.6 shows the arsenic concentrations in the unconfined (upper) aquifer wells. Figure 2.7 shows the arsenic concentrations in the semiconfined (lower) aquifer wells.

2.2.4 Other Dissolved Metals Analytical Data

The October 2016 dissolved metals analytical data are summarized in Table 2.3. Zinc and copper were not detected above the PALs or ESs in any of the seventeen monitoring wells and three extraction wells.

Iron was detected in six wells at concentrations exceeding the PAL (150 µg/L) and five wells at concentrations exceeding the ES (300 µg/L). Manganese was detected in eight wells at concentrations exceeding the PAL (25 µg/L) and ES (50 µg/L). The ES for iron and manganese are considered secondary health based standards that are based on aesthetics (i.e., odor and taste).

2.2.5 Natural Attenuation Parameters Analytical Data

The natural attenuation results are provided in Table 2.3. The results generally show elevated levels of nitrate and sulfate and low concentrations of TOC and methane. These results in combination with the field stabilization parameters of DO, ORP, iron, and sulfide (Table 2.2) show that the groundwater beneath the Site is aerobic to slightly anaerobic because DO values are greater than 1 mg/L and ORP values are positive at the majority of wells outside the immediate vicinity of the LNAPL area in both the unconfined and semiconfined aquifers. A more detailed assessment of natural attenuation will be conducted during the microcosm and bio-trap studies in 2016 and 2017 (refer to Sections 4 and 5).



3. Residential Well and Onsite Supply Well Sampling

On October 10, 2016, water samples were collected from six residential wells located near the Site and the onsite water supply well (DW01) in general accordance with the FSP and QAPP. The six residential wells included:

- 8713 Daniels 70 (RW1)
- 8627 Daniels 70 (RW2)
- 8454 Daniels 70 (RW3)
- 8526 Daniels 70 (RW4)
- 8783 Daniels 70 (RW5)
- 8542 West Doctor Lake Road (RW6)

The onsite water supply well serves the remediation equipment building. The water is used for sanitary facilities in the building and maintaining the remediation equipment but is not ingested by workers. The residential well and onsite water supply well locations are shown on Figure 3.1. The samples were analyzed for PCP, BTEX, and naphthalene. The well purging and sampling data are summarized in Table 2.2. The residential well sample analytical data are summarized in Table 3.1. A copy of the laboratory report and data validation are included in Appendix C. Historical residential and onsite water supply well PCP data are included in Appendix A.

4. Microcosm Study

A microcosm study was initiated in accordance with the Remediation System Shutdown Pilot Study Work Plan (GHD; November 2015). The objectives of this laboratory study are to gather the data necessary to:

- Determine whether natural attenuation of PCP is occurring at the Site
- Determine whether natural attenuation is occurring under aerobic conditions, anaerobic conditions, or both
- Determine a Site-specific biodegradation rate for PCP

During the drilling and well installation activities in November and December 2015, soil and groundwater samples were collected at borehole SB1. Borehole SB1 is located downgradient of the LNAPL where the groundwater is expected within the aerobic (i.e., oxygen rich) zone. Borehole/well MW29 is located closer to the LNAPL and elevated PCP concentrations where the groundwater is expected within the anaerobic (i.e., oxygen poor) zone. Both locations are shown on Figure 1.2. All samples were submitted to the GHD Innovative Technology Group (ITG) laboratory located in Niagara Falls, New York for the microcosm study.



Upon arrival at the laboratory, the soil and groundwater samples were analyzed for the following parameters to provide a characterization of baseline conditions for the study:

- pH
- PCP
- Diesel range organics
- Ammonia-nitrogen
- Orthophosphate-phosphorus
- Total and dissolved metals (groundwater)
- Total metals (soil)

Microcosms were set up to assess the potential for natural attenuation of PCP under aerobic and aerobic conditions using soil and groundwater samples collected at the Site. After 0, 3, 6, and 12 months, duplicate microcosms for each treatment will be sacrificed and the soil and groundwater samples would be analyzed for PCP. Depending on the results, additional testing may be conducted at extended durations.

4.1 Initial Groundwater and Soil Microcosm Tests

The results from the initial analysis of groundwater SB1, the groundwater from the aerobic area, showed 87 µg/L of PCP and 0.176 milligrams per liter (mg/L) of TPH(C₉-C₃₆). The pH was in the neutral range at 6.72, ammonia-nitrogen was below the analytical detection limit, and orthophosphate-phosphorus was present at 1.85 mg/L. Total iron was present at 27,600 µg/L and dissolved iron at 1,010 µg/L. Total manganese was present at 4,480 µg/L and dissolved manganese at 3,340 µg/L. These ratios of total to dissolved iron and manganese are consistent with the aerobic conditions known to exist in the area from which this sample was collected.

The results from the initial analysis of groundwater MW29, the groundwater from the anaerobic area, showed 1,430 µg/L of PCP and 1,540 mg/L of TPH(C₉-C₃₆). The pH was again in the neutral range at 6.71, ammonia-nitrogen was below the analytical detection limit, and orthophosphate-phosphorus was present at 1.45 mg/L. Total iron was present at 10,500 µg/L and dissolved iron was present at 270 µg/L. Total manganese was present at 2,530 µg/L and dissolved manganese at 2,350 µg/L. The manganese results are typical of anaerobic conditions; however, the dissolved iron concentration is lower than would be expected. These data are summarized in Table 4.1.

The results from the initial analysis of soil SB1, the soil sample collected from the aerobic area, showed 0.502 milligram per kilogram (mg/kg) of PCP and TPH(C₉-C₃₆) below the analytical detection limit. The pH of the soil was 7.14, ammonia-nitrogen was below the analytical detection limit, and orthophosphate-phosphorus was present at 27.8 mg/kg. The soil contained 6,880 mg/kg of total iron and 79.9 mg/kg of total manganese.

The results from the initial analysis of soil MW29, the soil sample collected from the anaerobic area, showed 61.0 mg/kg of PCP and 153 mg/kg of TPH(C₉-C₃₆). The pH of the soil was 6.65, ammonia-nitrogen was below the analytical detection limit, and orthophosphate-phosphorus was



present at 20.5 mg/kg. The soil contained 8,330 mg/kg of total iron and 94.6 mg/kg of total manganese. These data are shown in Table 4.2.

4.2 Aerobic Microcosm Tests

Microcosms were set up to assess the potential for natural attenuation of PCP and petroleum hydrocarbons under aerobic conditions using soil SB1 and groundwater SB1.

The following treatments were performed:

1. Soil and groundwater only (biotic control)
2. Soil, groundwater, oxygen
3. Soil/sand, groundwater, oxygen, and sodium azide (abiotic control)

After 0, 3, 6, and 12 months, duplicate microcosms for each treatment were to be sacrificed and analyzed for PCP and petroleum hydrocarbons in the soil and groundwater. After 3 months, significant treatment of the PCP was observed in the microcosms that contained soil and groundwater, and TPH(C₉-C₃₆) was removed to non-detect levels. Treatment of PCP was observed in microcosms that received oxygen. TPH(C₉-C₃₆) was also removed to non-detect levels in these microcosms. These data suggests that natural attenuation is effective for treatment of PCP and TPH in the aerobic zone of the Site. These data are shown in Tables 4.3 and 4.4.

After 6 months, PCP and TPH(C₉-C₃₆) were not detected in any of the biological microcosms. These data show that natural attenuation is effective for treatment of PCP and TPH in the aerobic zone of the Site. These data are shown in Tables 4.5 and 4.6.

PCP and TPH(C₉-C₃₆) concentrations did not decrease in sodium azide treatment samples (abiotic control), which confirms that the decreased concentrations in the soil and groundwater (biotic control) and soil, groundwater, and oxygen treatments are due to biological degradation.

Since both PCP and TPH(C₉-C₃₆) have been reduced to non-detect levels, no further analyses of these microcosms will be performed.

4.3 Anaerobic Microcosm Tests

Microcosms were set up to assess the potential for natural attenuation of PCP and TPH(C₉-C₃₆) under anaerobic conditions using soil and groundwater collected from the anaerobic zone of the Site. Microcosms were set up in the anaerobic hood.

The following treatments were performed:

1. Soil and groundwater only (biotic control)
2. Soil, groundwater, and emulsified vegetable oil (EVO)
3. Soil/sand, groundwater, and sodium azide (abiotic control)

After 0, 3, 6, and 12 months, duplicate microcosms for each treatment were to be sacrificed and analyzed for PCP in the soil and groundwater. Additional testing will be performed after 18 and 24 months, if required.



After 3 months, no reduction in the concentration of PCP was observed in any of the microcosms. An increase in the aqueous concentration of PCP was observed in some of the microcosms, which is likely associated with PCP partitioning out of the soil into the groundwater. Treatment of TPH(C₉-C₃₆) was observed in all microcosms. In microcosms containing soil and groundwater, removal of TPH(C₉-C₃₆) was observed. Removal of TPH(C₉-C₃₆) was also observed in the microcosms that received EVO. These data suggest that anaerobic biodegradation of the TPH has occurred; however 3 months is not enough time for anaerobic biodegradation of PCP to occur. These data are shown on Tables 4.7 and 4.8.

After 6 months, 35 percent removal of PCP was observed in the microcosms that received EVO. No removal of PCP was observed in any of the other microcosms, and the increases in aqueous PCP combined with decreases in soil PCP were again observed suggesting that PCP is partitioning out of the soil. Treatment of TPH(C₉-C₃₆) was again observed in all microcosms. In microcosms containing soil and groundwater, treatment of TPH(C₉-C₃₆) had increased to 42 percent, and 51 percent removal of TPH(C₉-C₃₆) was observed in the microcosms that received EVO. These data suggest that after 6 months some anaerobic degradation of the PCP has occurred in microcosms where anaerobic conditions were optimized with EVO. Anaerobic degradation of the TPH is continuing but appears to be slow. These data are shown in Tables 4.9 and 4.10.

5. Bio-Trap Study

A bio-trap study was initiated in accordance with the Remediation System Shutdown Pilot Study Work Plan (GHD; November 2015) in April 2016. The objectives of the bio-trap study were the gather the data necessary to:

1. Determine whether bacteria capable of degrading PCP are present at the Site
2. Demonstrate in situ biodegradation of PCP using a bio-trap

The bio-trap data are summarized in Table 5.1.

5.1 Bio-Trap Study

Bio-traps baited with ¹³C labelled PCP were obtained from Microbial Insights. They were installed in two wells in the source area (wells MW20 and MW29) and two wells in the downgradient area (wells MW9 and EW11S). The bio-traps were left in place for 32 days and then were removed and analyzed for the following:

- ¹³C PCP concentration
- Phospholipid Fatty Acids (PLFA)
- Stable Isotope Probing
- Dissolved ¹³C Inorganic Carbon



5.1.1 ¹³C Pentachlorophenol Concentration

An attempt to quantify ¹³C PCP in the bio-traps after deployment was made; however, the phenol group on the PCP has been found to chemisorb to the beads. Therefore, quantitative extraction of the PCP was not possible, and it was not possible to compare the concentration of PCP after the bio-traps were retrieved from the wells to the initial concentration of PCP in the bio-traps.

5.1.2 Phospholipid Fatty Acids

The biomass collected in the bio-traps was analyzed for PLFA. The biomass in the four bio-traps was similar with the source area. Bio-traps from source area wells MW20 and MW29 had counts of 3.8×10^5 cells per bead and 1.9×10^6 cells per bead, respectively. Bio-traps from downgradient wells MW9 and EW11S had counts of 2.3×10^6 cells per bead and 1.1×10^6 cells per bead, respectively.

The PLFA analysis showed that the dominant class of organism in the well MW20 bio-trap was Proteobacteria, which are fast growing gram negative bacteria and utilize many carbon sources and adapt quickly to a variety of environments. The dominant class of organism in the well MW29 bio-trap was Fimicutes, which are anaerobic fermenting bacteria. The well MW20 BioTrap also contained Fimicutes.

In the downgradient wells, the dominant type of organism in both wells was the Proteobacteria with very low percentage of Fimicutes. These data show that anaerobic bacteria were dominant in well MW29 and also present in well MW20 but not present in the downgradient wells. This is consistent with the source area being anaerobic while the downgradient area is more aerobic.

5.1.3 Stable Isotope Probing

Stable isotope probing demonstrated that ¹³C was incorporated into the microbial biomass. The ¹³C enriched biomass was between 1.1 and 2.0×10^4 cells per bead for wells MW9, MW29, and EW11S and 2.2×10^3 cells per bead for well MW20.

The ratio between the heavier and lighter isotopes is expressed as a delta value (δ). The δ value is calculated according to the following equation:

$$\delta(\text{‰}) = (R(\text{sample})/R(\text{standard})-1) \times 1000$$

R= ratio of heavy to light isotope

This ratio was calculated for the PLFA to determine the extent to which they were enriched in ¹³C. The average $\delta^{13}\text{C}$ values for the PLFA in wells MW9 and EW11S, as well as well MW20, ranged from 257 to 360 percent, which is in the moderate range indicating a moderate incorporation of ¹³C-labeled PCP into microbial biomass. The average $\delta^{13}\text{C}$ value for well MW29 was 94 percent, which is in the low range indicating low incorporation of ¹³C-labeled PCP into microbial biomass. Well MW29 had the greatest concentration of Fimicutes, which are anaerobic bacteria and a lower concentration of Proteobacteria, which are bacteria that can utilize a wide range of carbon sources. It is possible that Proteobacteria have a greater capacity to degrade PCP than Fimicutes.



5.1.4 Dissolved ¹³C Inorganic Carbon

$\delta^{13}\text{C}$ value for dissolved inorganic carbon was also measured in the bio-traps. If inorganic carbon was enriched in ¹³C, it would indicate that complete mineralization of the PCP to CO₂ had occurred. The natural abundance of ¹³C is approximately 1 percent, and the percent ¹³C in the inorganic carbon in the four bio-traps ranged from 1.08 to 1.09, which is very close to the natural abundance. $\delta^{13}\text{C}$ values ranged from -21 to -14 percent, which are near background levels; therefore, it appears that little to no PCP mineralization occurred during the 32 days in which the bio-traps were in place.

6. Microcosm and Bio-Trap Study Conclusions and Recommendations

The results from the microcosm tests indicate that PCP and TPH(C₉-C₃₆) are readily degradable under aerobic conditions and that TPH(C₉-C₃₆) is also degradable under anaerobic conditions. PCP degradation under anaerobic conditions is slower.

These conclusions are supported by the data from the bio-traps. In the bio-traps deployed in the downgradient area in wells MW9 and EW11S, the dominant class of organisms, the Proteobacteria degraded PCP and incorporated it into the biomass at a moderate rate. In the source area in wells MW20 and MW29, the bio-trap data appears to indicate that well MW20 may be in a transitional zone where some aerobic and some anaerobic processes are occurring. Although the bio-trap from MW20 contained the anaerobic Fimicutes, which were the dominant class of organisms in MW29, Proteobacteria were the dominant class of organisms in MW20, and the rate of incorporation of PCP into biomass was similar to the aerobic wells. In MW29, which was likely highly anaerobic, the Fimicutes dominated, and slower incorporation of PCP into biomass was observed.

No mineralization of PCP (i.e., degradation into CO₂) was observed in the bio-trap study; however, the bio-traps were deployed for only 32 days which may not be long enough for mineralization of PCP to occur.

Overall, the data suggests that monitored natural attenuation (MNA) would be an effective treatment for the downgradient area, and biodegradation of PCP and TPH(C₉-C₃₆) is expected to occur at a moderate rate. MNA may be effective for the source area and may be enhanced with the addition of EVO. The bio-trap data shows that PCP degradation does occur under anaerobic conditions; however, slower biodegradation rates are expected. Analysis of the microcosm after more time has elapsed will provide information about the rates that can be expected.

7. Waste Management and Disposal

Historical hazardous waste disposal is summarized in Appendix A. No waste was disposed during October through December 2016. GHD continues to collect and containerize PPE and other waste produced during sampling events onsite.



8. Continuing Obligations and Inspections

The WDNR has implemented Institutional Controls (ICs) at the Site in the form of Continuing Obligations (COs). COs are legal requirements designed to protect public health and the environment in regard to contamination that remains on a property, and COs still apply after a property is sold. The Long-Term Response Action Operation and Maintenance Plan (O&M Plan) – Addendum No. 1 (GHD; November 9, 2015) effectively serves as an Institutional Control Implementation and Assurance Plan (ICIAP). This section documents the COs in addition to inspections required by the O&M Plan (GHD; July 22, 2015).

8.1 Continuing Obligations

On July 6, 2015 the WDNR provided a letter approving the Remedial Actions with Continuing Obligations (WDNR BRRTS Activity #02-07-000532, FID #: 807050310). That letter approved the remedies which have been implemented at the Site and specified the condition with which any current or future owner of the property must comply to ensure that the Site does not pose a threat. These conditions or COs meet the intent of the ICs required by the Record of Decision for the Site.

CO maintenance consists of periodic monitoring and reporting to confirm that Site security is in place and providing protection as intended and that use of the land is restricted to maintain the integrity and functional effectiveness of the Site remedy.

Maintenance activities consist of periodic review of the property and COs by WDNR, notifications to new land owners or lessees, and continuing education for land owners and property users through annual updates and information. There was no transfer of ownership during the current monitoring period.

To facilitate monitoring of the COs, roles and responsibilities, schedules, corrective actions, and reporting requirements were performed as follows:

1. Periodic monitoring was conducted whenever WDNR or its contractors or other representatives were present at the Site.
2. Prohibition of use of the Site real estate is evaluated and updated on an annual basis (minimum frequency). This evaluation determined:
 - a. The selected remedy (i.e. remediation system shutdown pilot study and associated monitoring) remains in place and remains effective
 - b. Site security remains effective and real estate use meets the stated objectives and performance goals and provides protection required by the response
3. Evidence was not observed of the following improper uses:
 - a. Removal of the existing barrier or cover
 - b. Replacement with another barrier or cover
 - c. Excavating or grading of the land surface
 - d. Filling on covered or paved areas



- e. Plowing for agricultural cultivation
- f. Construction or placement of a building or other structure
- g. Changing the use or occupancy of the property to a residential exposure setting, which may include certain uses, such as single or multiple family residences, a school, day care, senior center, hospital, or similar residential exposure setting

An inspection of continuing obligations items was completed on October 7, 2016 and a copy of the continuing obligations inspection form is included in Appendix D.

8.2 Inspections

Additional inspections required by the O&M Plan (GHD; July 22, 2015) were conducted during this monitoring period. The results of the inspections are as follows:

- The CAMU area fence is in satisfactory condition and does not require repairs; the CAMU fence gates remain closed and locked when GHD and/or WDNR are not at the Site
- The CAMU area surface soils/vegetation were in good condition during this monitoring period and did not require repairs; erosion, subsidence, and ponding water were not observed on the CAMU

A site well inspection was completed on October 7, 2016 and a copy of the well inspection form is included in Appendix D.

9. Recommendations

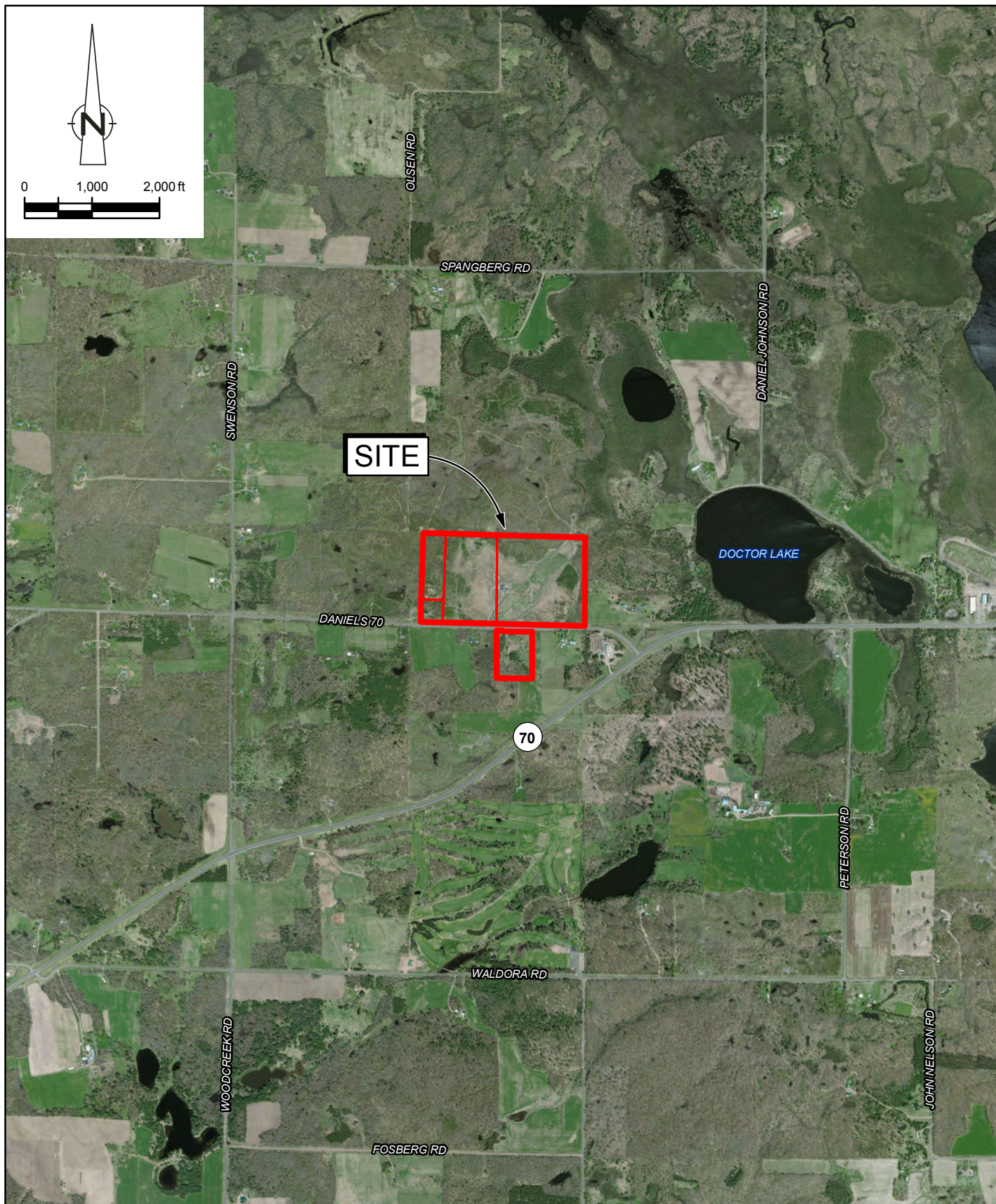
The following actions are recommended for the Site during the next reporting period:

- Keep the remediation system shut down and continue the pilot study monitoring and sampling at the Site based on the USEPA approved scope and schedule
- Continue microcosm study laboratory analyses and evaluation
- Conduct quarterly groundwater monitoring and sampling during January 2017
- Conduct semiannual residential well sampling during April 2017
- Repair wells MW4 and MW14 and collect groundwater samples to obtain baseline analytical data and assess whether additional wells are necessary to delineate the extent of PCP in the semiconfined (lower) aquifer
- Collect groundwater samples from wells EW07S and EW06D during January 2017 if LNAPL is not present to obtain baseline analytical data
- Assess future pilot study data to determine whether a change in the monitoring and sampling scope and schedule is appropriate and/or whether additional wells are needed to delineate the extent of PCP concentrations exceeding the ES
- Prepare and submit required monthly and quarterly reports



10. Certification

The current actions at the Site remain protective of human health and the environment based on an evaluation of the current data. Implementation of the pilot study contingency plan outlined in the Remediation System Pilot Study Work Plan (GHD; November 13, 2015) is not necessary at this time.



Source: DigitalGlobe 2011

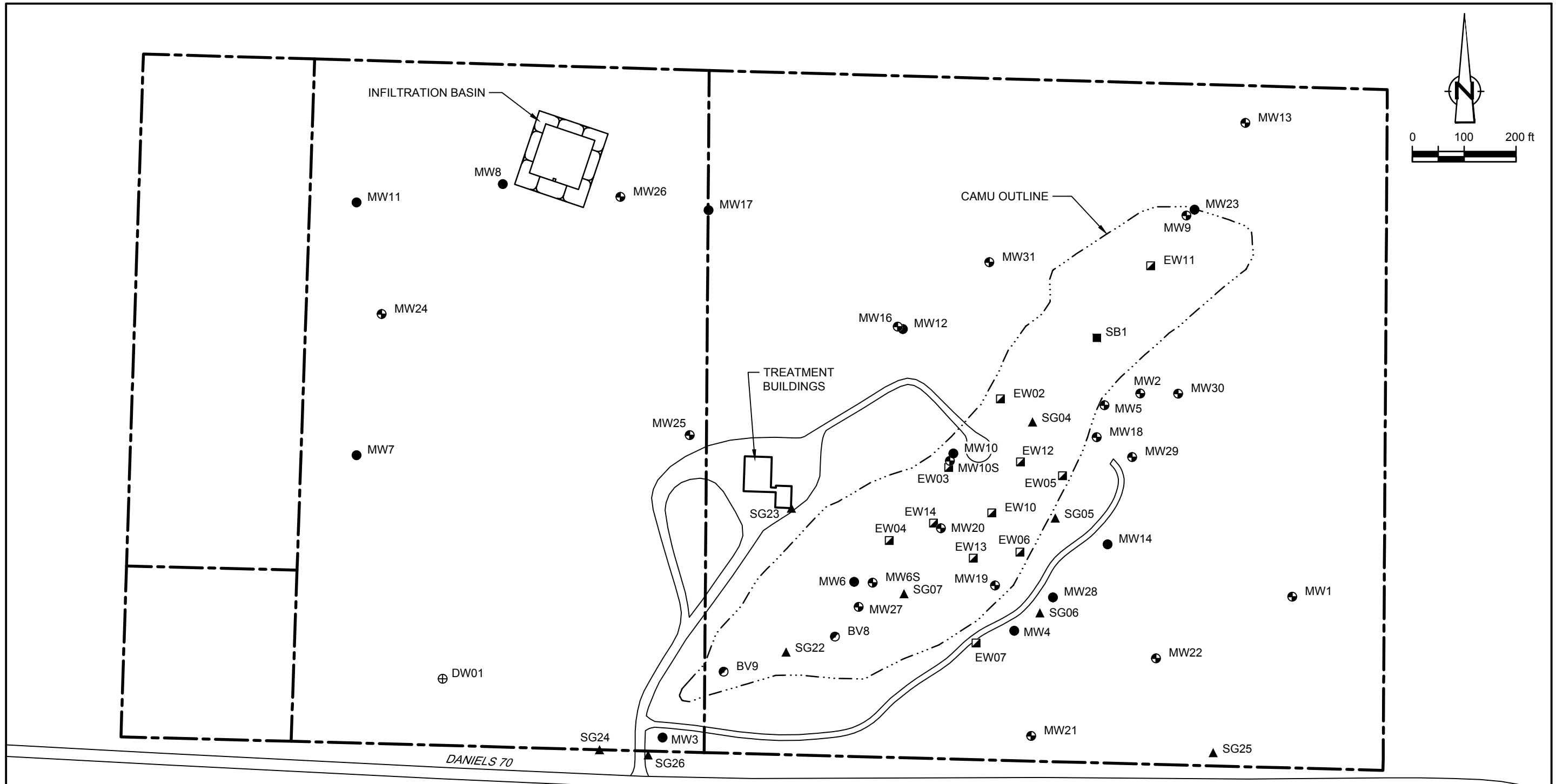


PENTA WOOD PRODUCTS SUPERFUND SITE
 SIREN, WISCONSIN
 QUARTERLY REPORT

086165-03-13
 Jan 2, 2017

SITE LOCATION

FIGURE 1.1



- LEGEND**
- PARCEL BOUNDARY
 - ▣ EW11 EXTRACTION WELL NEST
 - BV09 BIOVENTING WELL
 - ▲ SG05 SOIL GAS WELL NEST
 - ⊕ UNCONFINED MONITORING WELL LOCATION
 - SEMICONFINED MONITORING WELL LOCATION
 - ⊕ WATER SUPPLY WELL LOCATION
 - SOIL BORING LOCATION

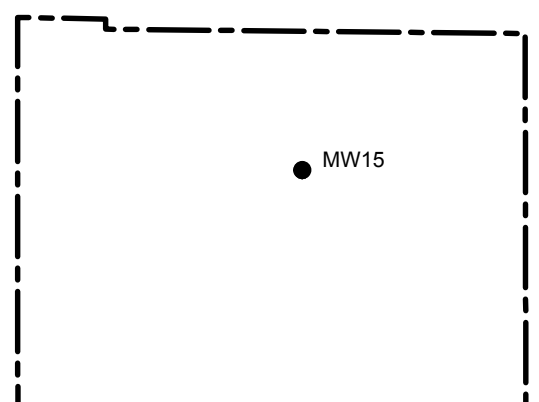
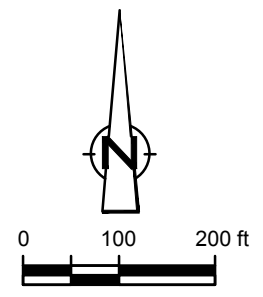
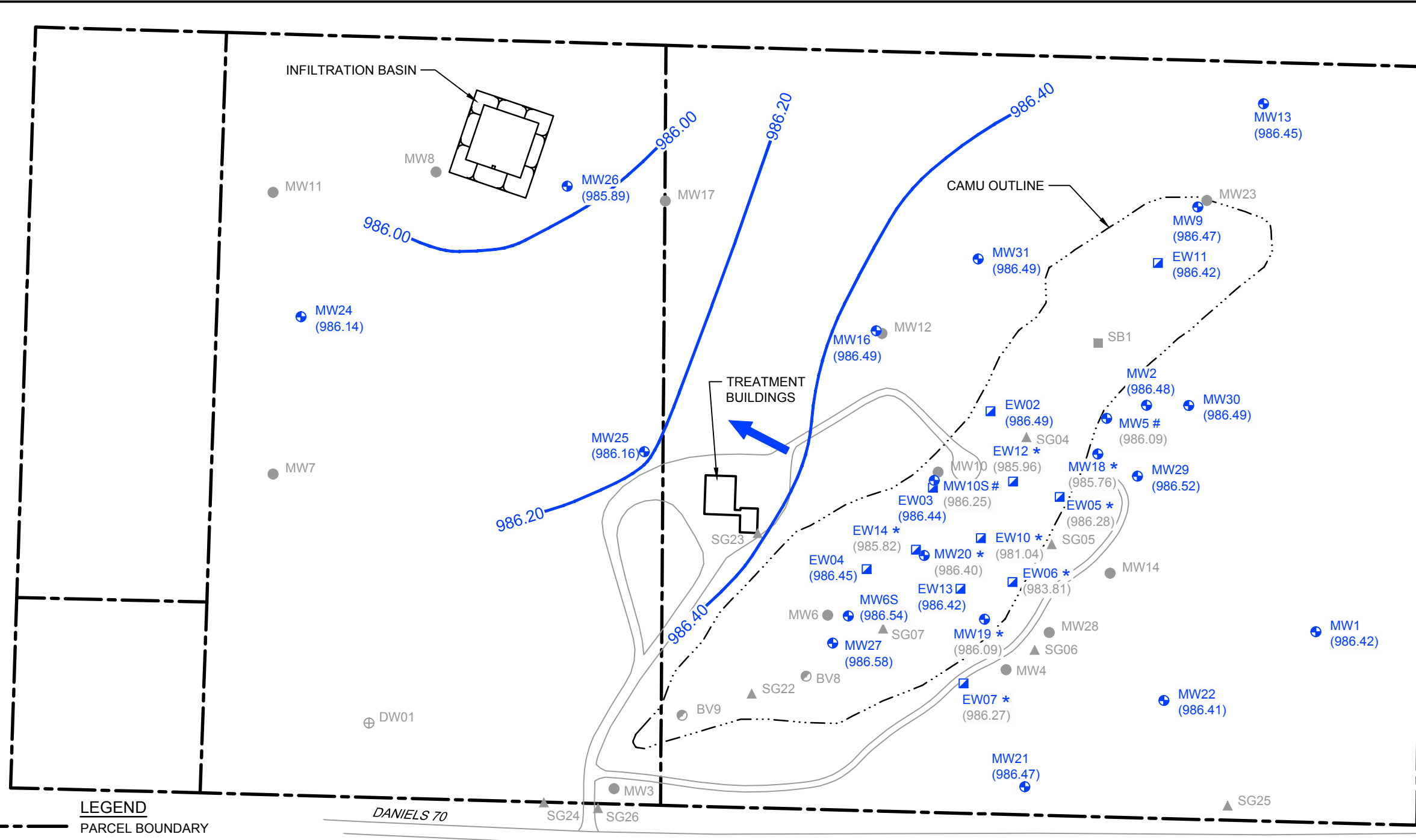


figure 1.2
 SITE PLAN
 PENTA WOOD PRODUCTS SUPERFUND SITE
 Siren, Wisconsin



SOURCE: KEMPER AND ASSOCIATES, INC. SURVEY DATED MAY 2016 (WISCONSIN BURNETT COUNTY COORDINATE SYSTEM NAD83, 1996).



LEGEND

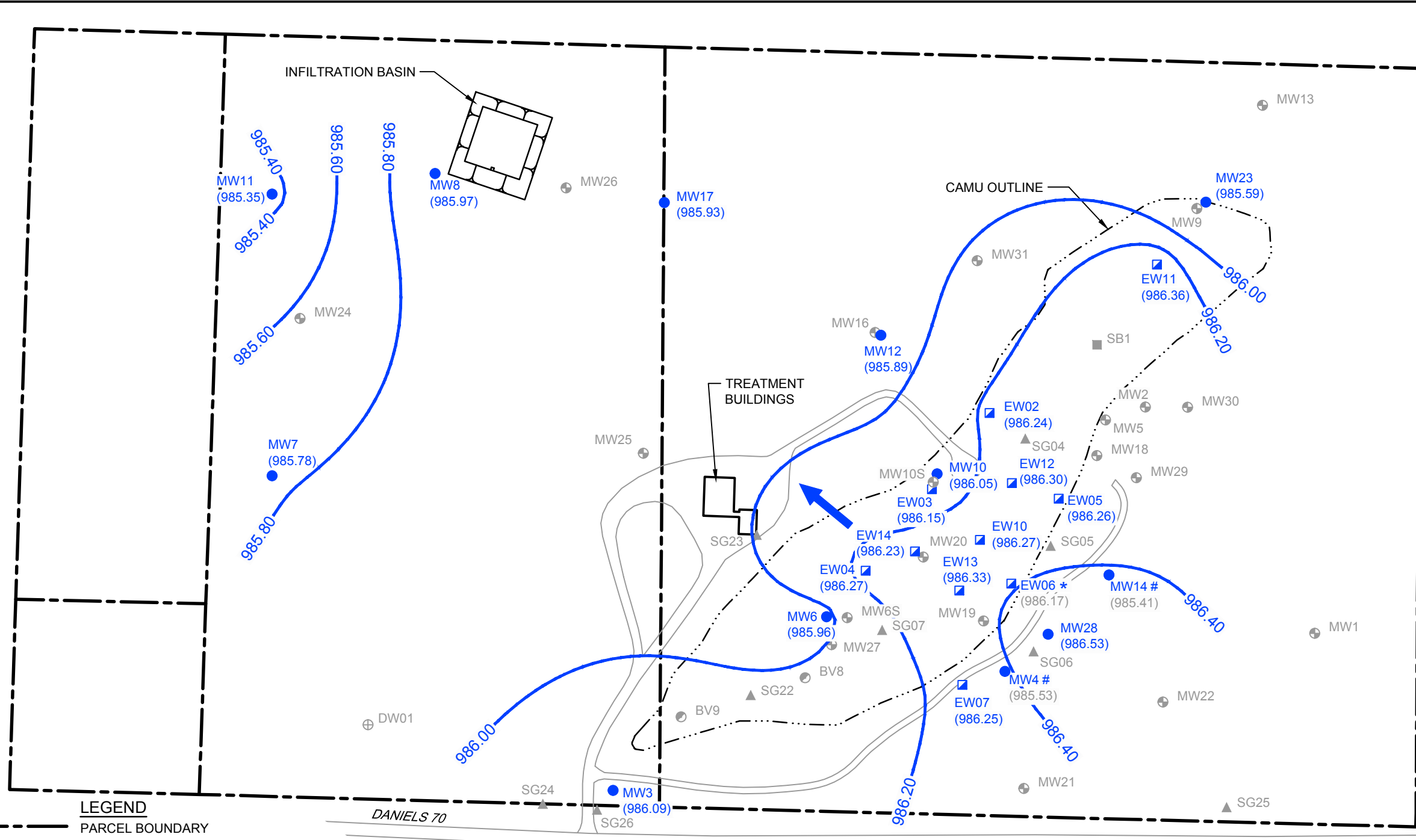
- PARCEL BOUNDARY
- EW11 EXTRACTION WELL NEST
- BV09 BIOVENTING WELL
- ▲ SG05 SOIL GAS WELL NEST
- ⊕ UNCONFINED MONITORING WELL LOCATION
- SEMICONFINED MONITORING WELL LOCATION
- ⊕ WATER SUPPLY WELL LOCATION
- SOIL BORING LOCATION
- (985.45) GROUNDWATER ELEVATION
- 986.00 GROUNDWATER ELEVATION CONTOUR
- ➔ GROUNDWATER FLOW DIRECTION
- * LNAPL PRESENT IN WELL, WELL NOT UTILIZED TO INFER GROUNDWATER ELEVATION CONTOURS
- # WELL NOT USED TO INFER GROUNDWATER ELEVATION CONTOURS

UNCONFINED (UPPER) AQUIFER GROUNDWATER CONTOURS - OCTOBER 2016
PENTA WOOD PRODUCTS SUPERFUND SITE
Siren, Wisconsin

figure 2.1



SOURCE: KEMPER AND ASSOCIATES, INC. SURVEY DATED MAY 2016 (WISCONSIN BURNETT COUNTY COORDINATE SYSTEM NAD83, 1996).

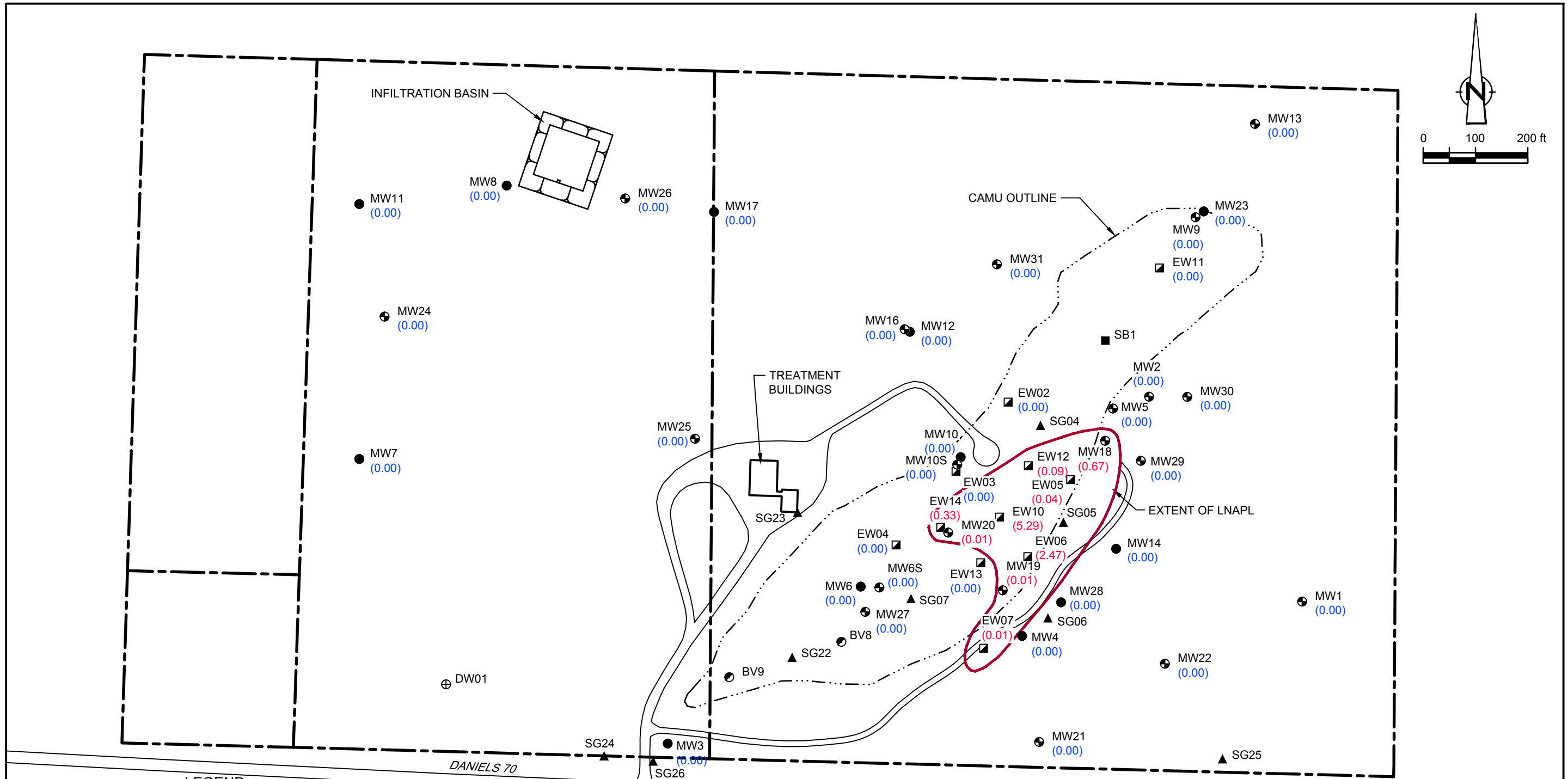


- LEGEND**
- PARCEL BOUNDARY
 - EW11 (blue square) EXTRACTION WELL NEST
 - BV09 (circle with cross) BIOVENTING WELL
 - SG05 (triangle) SOIL GAS WELL NEST
 - ⊕ UNCONFINED MONITORING WELL LOCATION
 - SEMICONFINED MONITORING WELL LOCATION
 - ⊕ WATER SUPPLY WELL LOCATION
 - SOIL BORING LOCATION
 - (985.35) GROUNDWATER ELEVATION
 - 986.10— GROUNDWATER ELEVATION CONTOUR
 - GROUNDWATER FLOW DIRECTION
 - * LNAPL PRESENT IN WELL, WELL NOT UTILIZED TO INFER GROUNDWATER ELEVATION CONTOURS
 - # WELL DAMAGED, WELL NOT UTILIZED TO INFER GROUNDWATER ELEVATION CONTOURS

figure 2.2
SEMICONFINED (LOWER) AQUIFER GROUNDWATER CONTOURS - OCTOBER 2016
PENTA WOOD PRODUCTS SUPERFUND SITE
Siren, Wisconsin



SOURCE: KEMPER AND ASSOCIATES, INC. SURVEY DATED MAY 2016 (WISCONSIN BURNETT COUNTY COORDINATE SYSTEM NAD83, 1996).



LEGEND

- PARCEL BOUNDARY
- EW11 EXTRACTION WELL NEST
- BV09 BIOVENTING WELL
- SG05 SOIL GAS WELL NEST
- UNCONFINED MONITORING WELL LOCATION
- SEMICONFINED MONITORING WELL LOCATION
- WATER SUPPLY WELL LOCATION
- SOIL BORING LOCATION
- (0.00) LNAPL NOT PRESENT
- (0.24) LNAPL THICKNESS (FEET)
- EXTENT OF LNAPL

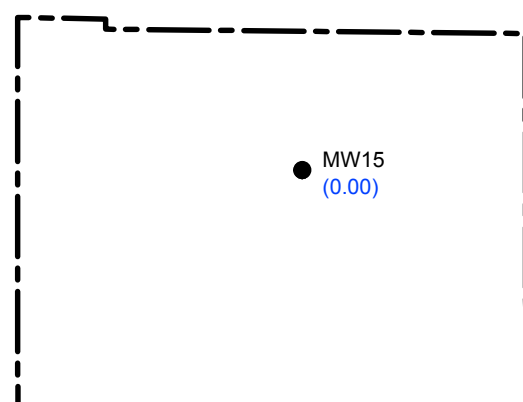
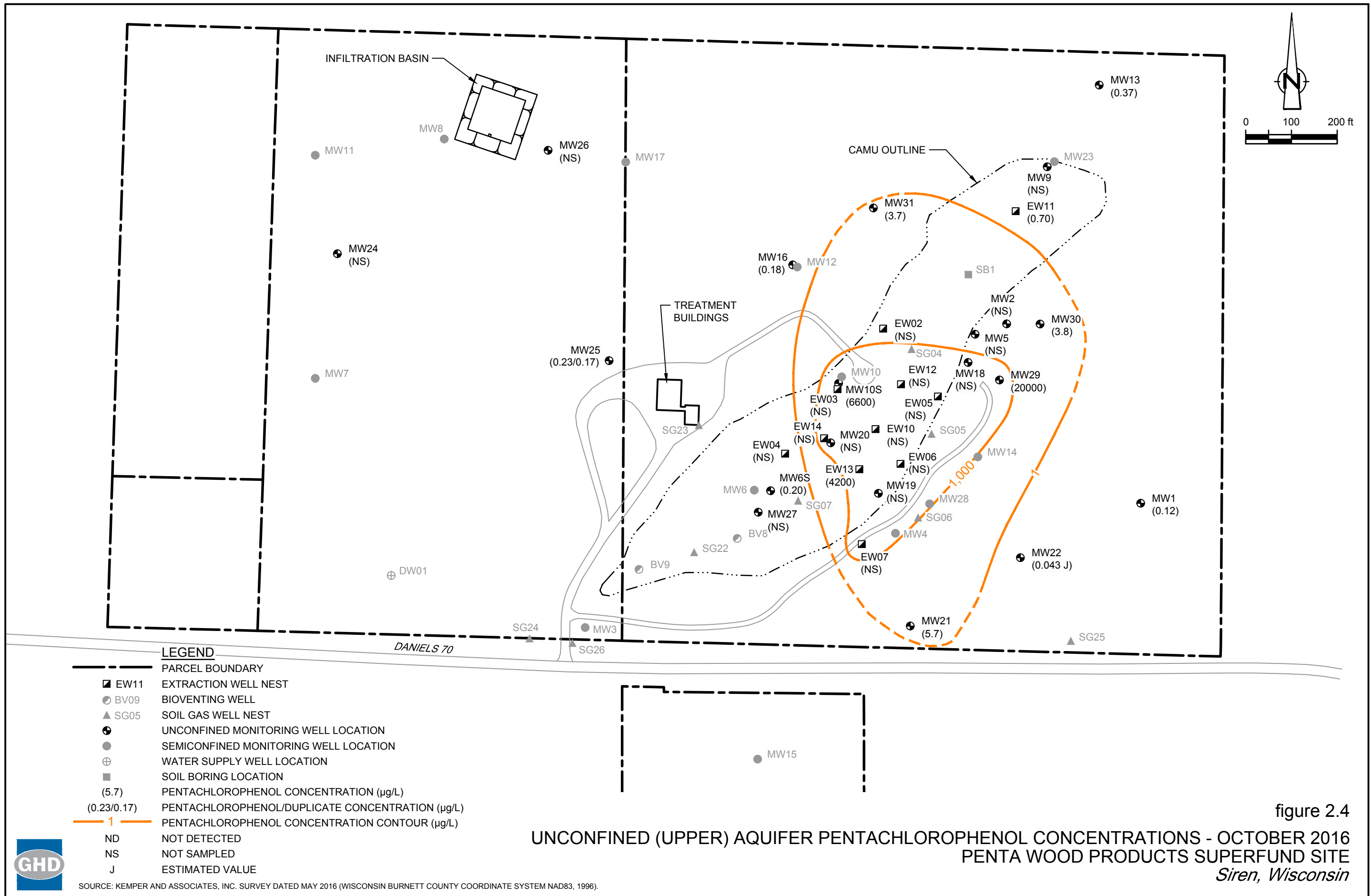


figure 2.3
 LNAPL THICKNESS - OCTOBER 2016
 PENTA WOOD PRODUCTS SUPERFUND SITE
 Siren, Wisconsin



SOURCE: KEMPER AND ASSOCIATES, INC. SURVEY DATED MAY 2016 (WISCONSIN BURNETT COUNTY COORDINATE SYSTEM NAD83, 1996).



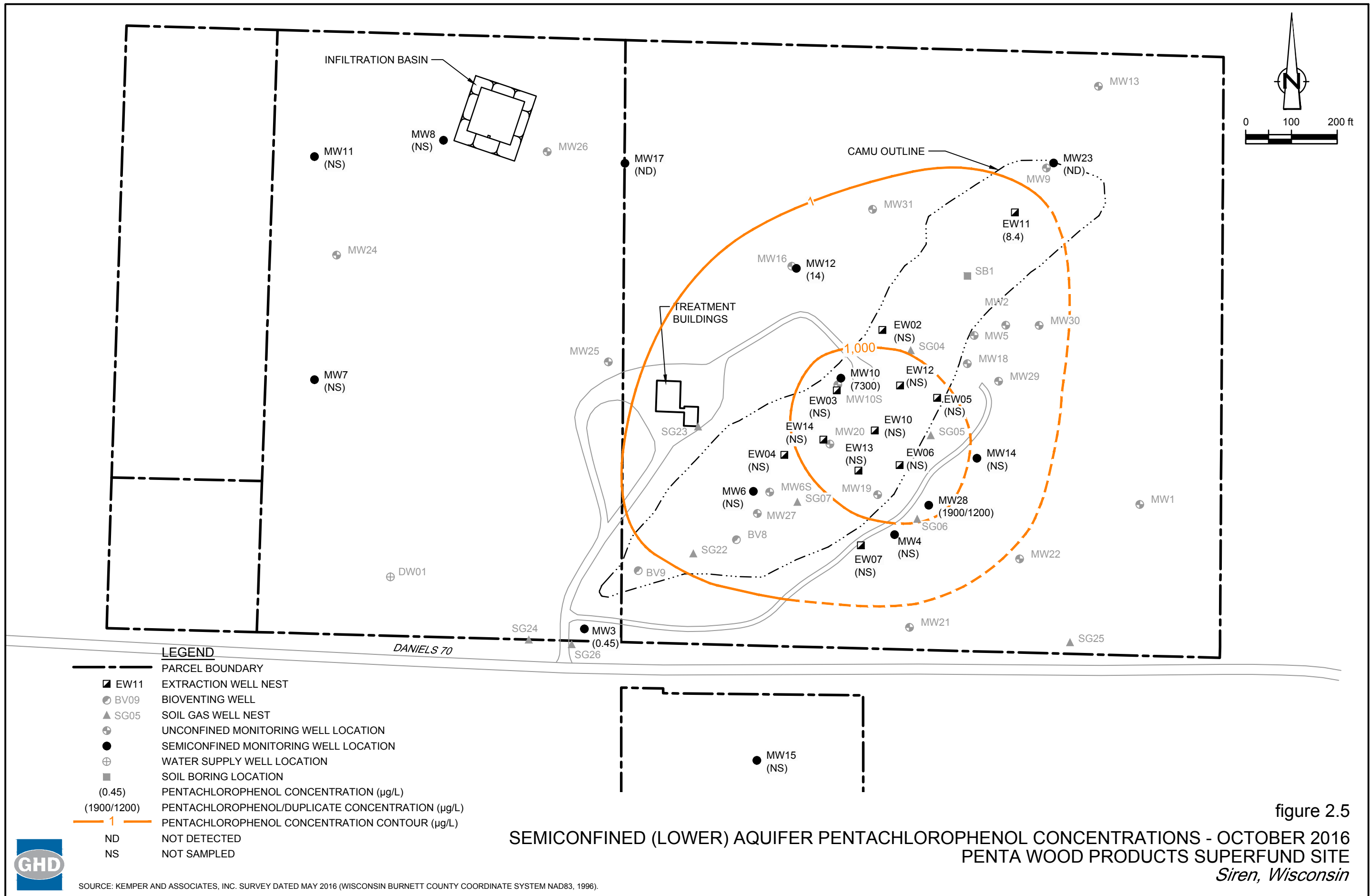


figure 2.5



SOURCE: KEMPER AND ASSOCIATES, INC. SURVEY DATED MAY 2016 (WISCONSIN BURNETT COUNTY COORDINATE SYSTEM NAD83, 1996).

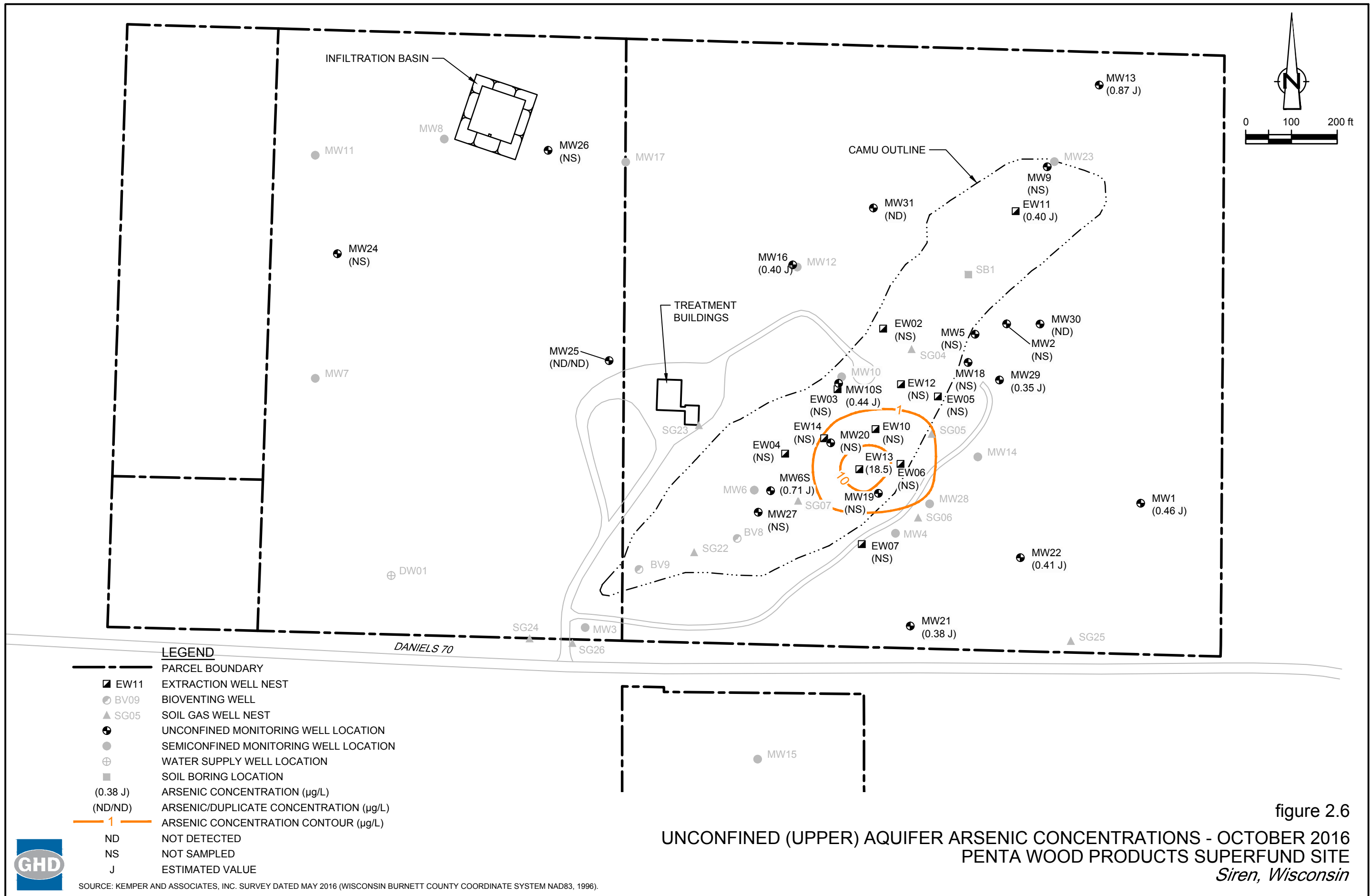
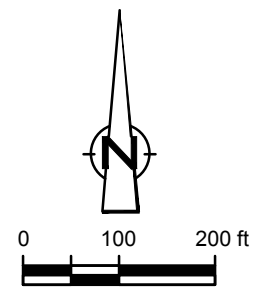
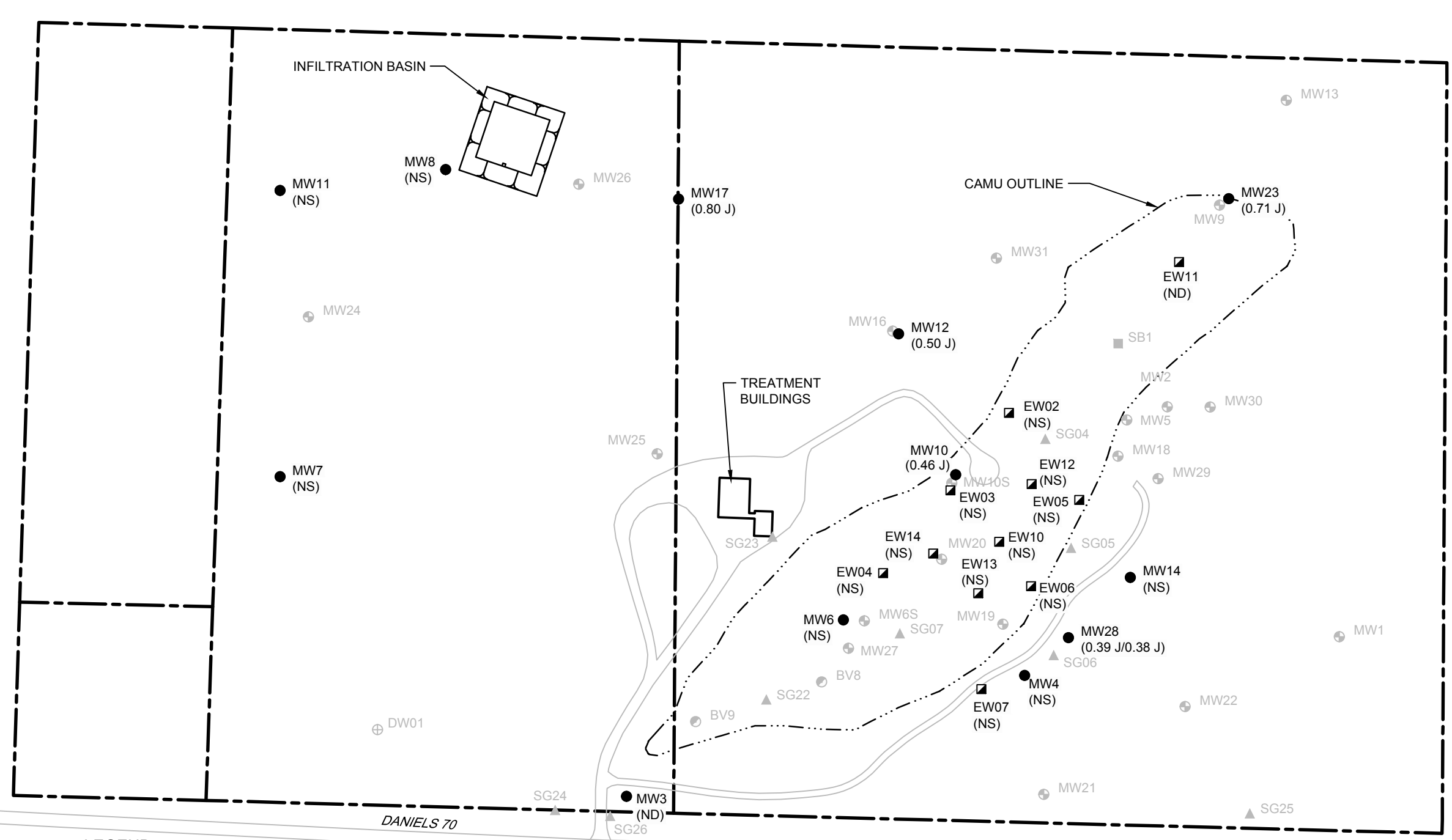


figure 2.6
 UNCONFINED (UPPER) AQUIFER ARSENIC CONCENTRATIONS - OCTOBER 2016
 PENTA WOOD PRODUCTS SUPERFUND SITE
 Siren, Wisconsin



LEGEND

---	PARCEL BOUNDARY
█ EW11	EXTRACTION WELL NEST
● BV09	BIOVENTING WELL
▲ SG05	SOIL GAS WELL NEST
⊕	UNCONFINED MONITORING WELL LOCATION
●	SEMICONFINED MONITORING WELL LOCATION
⊕	WATER SUPPLY WELL LOCATION
■	SOIL BORING LOCATION
(0.46J)	ARSENIC CONCENTRATION (µg/L)
(0.39J/0.38J)	ARSENIC/DUPLICATE CONCENTRATION (µg/L)
ND	NOT DETECTED
NS	NOT SAMPLED

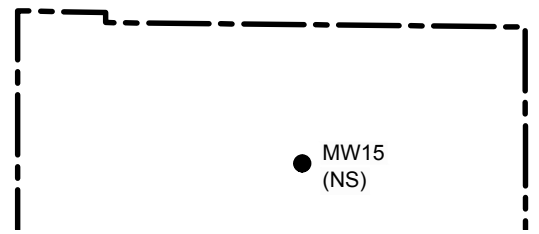
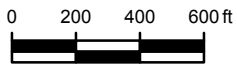
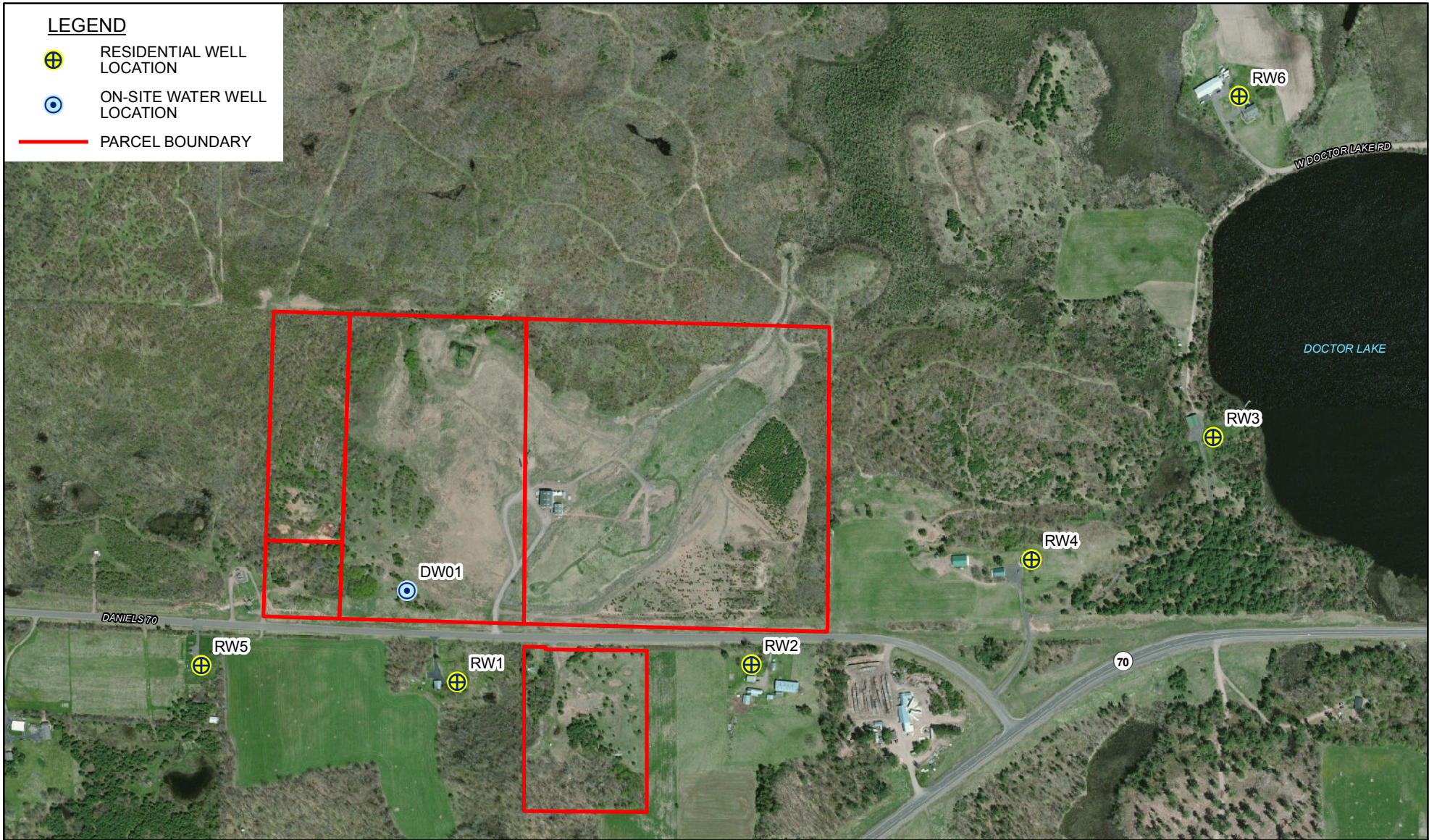


figure 2.7
SEMICONFINED (LOWER) AQUIFER ARSENIC CONCENTRATIONS - OCTOBER 2016
PENTA WOOD PRODUCTS SUPERFUND SITE
Siren, Wisconsin



SOURCE: KEMPER AND ASSOCIATES, INC. SURVEY DATED MAY 2016 (WISCONSIN BURNETT COUNTY COORDINATE SYSTEM NAD83, 1996).



PENTA WOOD PRODUCTS SUPERFUND SITE
 SIREN, WISCONSIN
 QUARTERLY REPORT

RESIDENTIAL WELL LOCATIONS

086165-03-13
 Jan 30, 2017

FIGURE 3.1

Table 2.1

**Groundwater and LNAPL Level Monitoring Data
Penta Wood Products Superfund Site
Siren, Wisconsin**

Well ID	Date	Top of Casing Elevation (feet)	Depth to Groundwater (feet btoc)	Depth to LNAPL (feet btoc)	Groundwater Elevation (feet AMSL)	LNAPL Elevation (feet AMSL)	LNAPL Thickness (feet)
Semiconfined Aquifer (Lower)							
MW3	10/7/2016	1129.44	143.35	ND	986.09	NA	0.00
MW4	10/7/2016	1087.74	102.21	ND	985.53	NA	0.00
MW6	10/7/2016	1109.11	123.15	ND	985.96	NA	0.00
MW7	10/7/2016	1096.25	110.47	ND	985.78	NA	0.00
MW8	10/7/2016	1091.13	105.16	ND	985.97	NA	0.00
MW10	10/7/2016	1089.01	102.96	ND	986.05	NA	0.00
MW11	10/7/2016	1085.48	100.13	ND	985.35	NA	0.00
MW12	10/7/2016	1080.91	95.02	ND	985.89	NA	0.00
MW14	10/7/2016	1078.37	92.96	ND	985.41	NA	0.00
MW15	10/7/2016	1127.09	140.89	ND	986.20	NA	0.00
MW17	10/7/2016	1084.43	98.50	ND	985.93	NA	0.00
MW23	10/7/2016	1017.45	31.86	ND	985.59	NA	0.00
MW28	10/7/2016	1083.52	96.99	ND	986.53	NA	0.00
EW02D	10/7/2016	1083.00	96.76	ND	986.24	NA	0.00
EW03D	10/7/2016	1089.48	103.33	ND	986.15	NA	0.00
EW04D	10/7/2016	1101.09	114.82	ND	986.27	NA	0.00
EW05D	10/7/2016	1076.99	90.73	ND	986.26	NA	0.00
EW06D	10/7/2016	1083.39	97.22	97.21	986.17	986.18	0.01
EW07D	10/7/2016	1087.52	101.27	ND	986.25	NA	0.00
EW10D	10/7/2016	1088.55	102.28	ND	986.27	NA	0.00
EW11D	10/7/2016	1048.19	61.83	ND	986.36	NA	0.00
EW12D	10/7/2016	1086.41	100.11	ND	986.30	NA	0.00
EW13D	10/7/2016	1092.88	106.55	ND	986.33	NA	0.00
EW14D	10/7/2016	1098.28	112.05	ND	986.23	NA	0.00

Table 2.1

**Groundwater and LNAPL Level Monitoring Data
Penta Wood Products Superfund Site
Siren, Wisconsin**

Well ID	Date	Top of Casing Elevation (feet)	Depth to Groundwater (feet btoc)	Depth to LNAPL (feet btoc)	Groundwater Elevation (feet AMSL)	LNAPL Elevation (feet AMSL)	LNAPL Thickness (feet)
Unconfined Aquifer (Upper)							
MW1	10/7/2016	1072.27	85.85	ND	986.42	NA	0.00
MW2	10/7/2016	1065.03	78.55	ND	986.48	NA	0.00
MW5	10/7/2016	1071.39	85.30	ND	986.09	NA	0.00
MW6S	10/7/2016	1108.35	121.81	ND	986.54	NA	0.00
MW9	10/7/2016	1019.58	33.11	ND	986.47	NA	0.00
MW10S	10/7/2016	1090.12	103.87	ND	986.25	NA	0.00
MW13	10/7/2016	1005.81	19.36	ND	986.45	NA	0.00
MW16	10/7/2016	1081.95	95.46	ND	986.49	NA	0.00
MW18	10/7/2016	1071.96	86.20	85.53	985.76	986.43	0.67
MW19	10/7/2016	1087.96	101.87	101.86	986.09	986.10	0.01
MW20	10/7/2016	1098.16	111.76	111.75	986.40	986.41	0.01
MW21	10/7/2016	1095.82	109.35	ND	986.47	NA	0.00
MW22	10/7/2016	1084.65	98.24	ND	986.41	NA	0.00
MW24	10/7/2016	1084.04	97.90	ND	986.14	NA	0.00
MW25	10/7/2016	1095.25	109.09	ND	986.16	NA	0.00
MW26	10/7/2016	1086.87	100.98	ND	985.89	NA	0.00
MW27	10/7/2016	1110.96	124.38	ND	986.58	NA	0.00
MW29	10/7/2016	1070.24	83.72	ND	986.52	NA	0.00
MW30	10/7/2016	1048.98	62.49	ND	986.49	NA	0.00
MW31	10/7/2016	1076.34	89.85	ND	986.49	NA	0.00
EW02S	10/7/2016	1082.25	95.76	ND	986.49	NA	0.00
EW03S	10/7/2016	1088.66	102.22	ND	986.44	NA	0.00
EW04S	10/7/2016	1101.01	114.56	ND	986.45	NA	0.00
EW05S	10/7/2016	1077.04	90.76	90.72	986.28	986.32	0.04
EW06S	10/7/2016	1083.61	99.80	97.33	983.81	986.28	2.47
EW07S	10/7/2016	1087.49	101.22	101.21	986.27	986.28	0.01
EW10S	10/7/2016	1088.72	107.68	102.39	981.04	986.33	5.29
EW11S	10/7/2016	1047.23	60.81	ND	986.42	NA	0.00
EW12S	10/7/2016	1086.31	100.35	100.26	985.96	986.05	0.09
EW13S	10/7/2016	1092.88	106.46	ND	986.42	NA	0.00
EW14S	10/7/2016	1098.32	112.50	112.17	985.82	986.15	0.33

Notes:

- 1 - Depth to water was not measure due to inability to break through LNAPL with probe
- btoc - Feet below top of casing
- feet AMSL - Feet above mean sea level
- NA - Not applicable
- ND - LNAPL was not detected in a measurable quantity

Table 2.2

**Groundwater Purging and Sampling Data
Penta Wood Products Superfund Site
Siren, Wisconsin**

Location	Date	Sample Identification	Time	Purge Volume (gallons)	Temperature (°C)	Specific	Turbidity (NTU)	Dissolved	pH	ORP (mV)	Total Iron (mg/L)	Total Sulfide (mg/L)
						Conductance (µS)		Oxygen (mg/L)				
MW1	10/12/2016	W-161012-PS-11	9:30	1.1	9.27	204	22.5	10.65	7.95	72	-	-
			9:35	2.1	9.62	203	18.0	10.66	7.70	88	-	-
			9:40	3.2	9.60	191	15.6	10.64	7.65	89	-	-
			9:45	4.2	9.66	203	15.2	10.44	7.64	92	-	-
			9:50	5.3	9.54	200	13.5	10.51	7.64	93	0.4	ND
MW3	10/11/2016	W-161011-PS-10	11:40	1.3	9.93	494	35	0.00	8.06	62	-	-
			11:45	2.2	10.64	528	109	1.21	8.04	-116	-	-
			11:50	3.2	11.65	561	109	3.74	7.77	-71	-	-
			11:55	4.1	11.95	574	105	4.84	7.68	-52	-	-
			12:00	5.0	12.06	577	89.5	5.27	7.64	-39	-	-
			12:05	5.9	12.12	583	92.0	5.56	7.62	-30	-	-
			12:10	6.9	12.14	582	93.1	5.66	7.61	-26	1.5	ND
MW6S	10/13/2016	W-161013-PS-22	13:10	3.0	12.03	387	520	7.16	6.94	32	4.3	ND
MW10	10/13/2016	W-161013-PS-19	10:35	1.6	10.79	398	18.0	0.52	7.62	-123	-	-
			10:40	3.2	11.09	388	37.0	0.24	7.64	-119	-	-
			10:45	4.8	11.11	390	17.2	0.20	7.65	-115	-	-
			10:50	6.3	11.10	387	12.5	0.14	7.66	-113	-	-
			10:55	7.9	11.12	387	7.6	0.12	7.66	-109	0.6	ND
MW10S	10/13/2016	W-161013-PS-20	11:20	1.3	12.03	201	9.0	0.00	7.10	10	-	-
			11:25	2.6	12.06	206	10.0	0.00	6.92	17	-	-
			11:30	4.0	12.11	209	11.0	0.00	6.83	21	-	-
			11:35	5.3	12.09	209	11.3	0.00	6.81	22	ND	ND
MW12	10/12/2016	W-161012-PS-13	11:15	0.9	10.93	536	7.1	7.79	7.64	72	-	-
			11:20	1.8	12.02	616	8.5	4.46	7.49	50	-	-
			11:25	2.8	12.05	642	6.0	3.55	7.43	54	-	-
			11:30	3.7	11.95	640	5.8	3.58	7.40	53	-	-
			11:35	4.6	11.97	647	5.4	3.34	7.37	54	ND	ND

Table 2.2

**Groundwater Purging and Sampling Data
Penta Wood Products Superfund Site
Siren, Wisconsin**

Location	Date	Sample Identification	Time	Purge Volume (gallons)	Temperature (°C)	Specific	Turbidity (NTU)	Dissolved	pH	ORP (mV)	Total Iron (mg/L)	Total Sulfide (mg/L)
						Conductance (µS)		Oxygen (mg/L)				
MW13	10/10/2016	W-161010-PS-02 (MS/MSD)	12:13	0.7	11.32	105	7.8	7.87	5.81	176	-	-
			12:18	1.3	11.29	105	5.0	7.73	5.75	183	-	-
			12:23	2.0	11.29	106	4.6	7.68	5.73	189	-	-
			12:28	2.6	11.20	107	4.2	7.65	5.72	200	-	-
			12:33	3.3	11.15	107	4.1	7.56	5.72	203	-	-
			12:38	4.0	11.15	107	4.3	7.56	5.72	205	ND	ND
MW16	10/12/2016	W-161012-PS-14	11:15	3.0	10.10	90	65.2	7.41	7.57	76	0.4	ND
MW17	10/11/2016	W-161011-PS-08	10:05	1.3	10.57	672	4.2	5.33	7.95	84	-	-
			10:10	2.6	11.77	676	5.2	6.10	7.92	60	-	-
			10:15	4.0	11.78	675	4.8	6.11	7.91	57	-	-
			10:20	5.3	11.73	674	4.6	6.09	7.91	56	ND	ND
MW21	10/11/2016	W-161011-PS-09	10:55	1.3	11.40	334	8.2	11.01	7.88	58	-	-
			11:00	2.6	11.41	335	8.4	11.01	7.73	62	-	-
			11:05	4.0	11.51	338	8.1	10.99	7.55	74	-	-
			11:10	5.3	11.54	337	9.3	10.96	7.49	76	-	-
			11:15	6.6	11.54	341	10.3	10.96	7.44	79	ND	ND
MW22	10/12/2016	W-161012-PS-12	11:00	3.0	8.72	160	95.0	8.36	7.82	65	1.2	ND
MW23	10/11/2016	W-161011-PS-07	9:05	1.3	8.74	478	9.7	7.82	8.06	-37	-	-
			9:10	2.6	8.69	478	7.0	7.76	8.13	-13	-	-
			9:15	4.0	8.64	478	5.9	7.74	8.16	4	-	-
			9:20	5.3	8.62	478	5.9	7.71	8.17	13	-	-
			9:25	6.6	8.63	477	5.7	7.70	8.17	21	-	-
			9:30	7.9	8.62	477	5.4	7.71	8.17	23	ND	ND

Table 2.2

**Groundwater Purging and Sampling Data
Penta Wood Products Superfund Site
Siren, Wisconsin**

Location	Date	Sample Identification	Time	Purge Volume (gallons)	Temperature (°C)	Specific	Turbidity (NTU)	Dissolved	pH	ORP (mV)	Total Iron (mg/L)	Total Sulfide (mg/L)
						Conductance (µS)		Oxygen (mg/L)				
MW25	10/10/2016	W-161010-PS-05 W-161010-PS-06 (Duplicate)	15:35	1.3	11.96	117	161	10.60	6.85	97	-	-
			15:40	2.6	12.29	120	31.0	10.64	6.86	108	-	-
			15:45	4.0	12.28	120	30.0	10.65	6.91	113	-	-
			15:50	5.3	12.38	121	29.0	10.67	6.92	117	ND	ND
MW28	10/13/2016	W-161013-PS-16 W-161013-PS-17 (Duplicate)	8:40	1.3	9.67	280	10.2	2.55	7.81	27	-	-
			8:45	2.6	10.96	283	9.9	2.44	7.88	23	-	-
			8:50	4.0	12.13	283	8.6	2.41	7.91	9	-	-
			8:55	5.3	12.99	283	7.4	2.77	7.92	2	-	-
			9:00	6.6	12.29	294	5.4	3.61	7.93	4	-	-
			9:05	7.9	12.80	295	5.5	3.72	7.92	5	-	-
			9:10	9.2	12.61	296	5.2	4.07	7.94	9	ND	ND
MW29	10/14/2016	W-161014-PS-24	8:50	1.3	12.18	268	84.0	1.47	6.03	-10	-	-
			8:55	2.6	12.31	267	57.0	0.18	5.98	4	-	-
			9:00	4.0	12.36	265	44.1	0.13	5.98	13	-	-
			9:05	5.3	12.38	264	62.3	0.12	5.98	20	1.8	0.1
MW30	10/12/2016	W-161012-PS-15	12:20	1.3	9.38	192	105	1.03	7.01	58	-	-
			12:25	2.6	9.45	193	28.0	0.96	6.77	87	-	-
			12:30	4.0	9.47	192	16.0	0.95	6.67	99	-	-
			12:35	5.3	9.46	191	13.3	0.98	6.65	105	-	-
			12:40	6.6	9.45	191	10.1	1.00	6.60	111	ND	ND
MW31	10/13/2016	W-161013-PS-18	10:00	1.3	10.75	213	10.8	11.28	7.37	57	-	-
			10:05	2.6	10.76	213	10.9	11.03	7.37	60	-	-
			10:10	4.0	10.76	213	10.9	10.94	7.37	64	ND	ND
EW11D	10/10/2016	W-161010-PS-03	13:33	0.8	10.28	671	26.0	2.46	7.08	-98	-	-
			13:38	1.6	10.34	675	24.8	2.47	7.25	-95	-	-
			13:43	2.4	10.36	674	26.3	2.41	7.35	-94	-	-
			13:48	3.2	10.36	675	19.0	2.41	7.38	-94	-	-
			13:53	4.0	10.37	678	15.0	2.57	7.44	-89	-	-
			13:58	4.8	10.36	678	13.0	2.60	7.46	-87	-	-
			14:03	5.5	10.36	681	15.1	2.59	7.46	-85	1.4	ND

Table 2.2

**Groundwater Purging and Sampling Data
Penta Wood Products Superfund Site
Siren, Wisconsin**

Location	Date	Sample Identification	Time	Purge Volume (gallons)	Temperature (°C)	Specific	Turbidity (NTU)	Dissolved	pH	ORP (mV)	Total Iron (mg/L)	Total Sulfide (mg/L)
						Conductance (µS)		Oxygen (mg/L)				
EW11S	10/10/2016	W-161010-PS-04	14:20	0.8	10.45	280	17.7	3.57	6.73	128	-	-
			14:25	1.6	10.74	283	8.8	3.44	6.45	147	-	-
			14:30	2.4	10.76	283	7.0	3.34	6.41	145	-	-
			14:35	3.2	10.77	284	6.5	3.22	6.39	140	-	-
			14:40	4.0	10.82	285	6.3	3.15	6.38	136	0.5	ND
EW13S	10/14/2016	W-161014-PS-23 Purged on 10/13/2016	12:12	NM	10.65	716	131	0.25	7.30	-143	-	-
			12:16	5.0	11.21	705	222	0.08	7.09	-144	-	-
			12:18	6.0	10.96	698	174	0.05	7.31	-74	10	ND
RW1	10/10/2016	W-161010-PS-26	12:15	45	8.0	822.0	NM	NM	7.22	NM	NM	NM
RW2	10/10/2016	W-161010-PS-27	12:45	45	8.0	293.9	NM	NM	7.82	NM	NM	NM
RW3	10/10/2016	W-161010-PS-29	13:40	30	8.6	244.6	NM	NM	7.37	NM	NM	NM
RW4	10/10/2016	W-161010-PS-28	13:10	15	12.8	428.6	NM	NM	7.55	NM	NM	NM
RW5	10/10/2016	W-161010-PS-25	11:40	30	9.4	318.4	NM	NM	7.85	NM	NM	NM
RW6	10/10/2016	W-161010-PS-30	14:05	45	9.0	183.5	188	NM	7.46	NM	NM	NM

Notes:

- °C - Degrees Celcius
 - µS - Micro-Siemens
 - mg/L - Milligrams per liter
 - MS/MSD - Matrix Spike Sample & Matrix Spike Duplicate Sample
 - mV - Millivolts
 - ND - Not Detected
 - NM - Not Measured
 - NTU - National Turbidity Units
 - ORP - Oxidation Reduction Potential (ORP) reported in millivolts (mV)
- Wells MW20, EW07S, EW06D were not sampled due to the presence of LNAPL

Table 2.3

Groundwater Analytical Data - Monitoring and Extraction Wells
Penta Wood Products Superfund Site
Siren, Wisconsin

Sample Location	Sample Identification	Sample Date	Alkalinity, total (as CaCO3) mg/L	Hardness, carbonate mg/L	Chloride ³ mg/L	Nitrate (as N) mg/L	Sulfate ³ mg/L	TOC averages mg/L	Methane (dissolved) ug/L	Arsenic (dissolved) ug/L	Copper (dissolved) ug/L	Iron (dissolved) ³ ug/L	Manganese (dissolved) ³ ug/L	Zinc (dissolved) ³ ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L
ES ¹	-	-	250	10	250	-	-	10	1300	300	50	5000	1	100	5	700	800	2000		
PAL ²	-	-	125	2	125	-	-	1	130	150	25	2500	0.1	10	0.5	140	160	400		
Semiconfined Aquifer (Lower)																				
EW11D	W-161010-PS-03	10/10/2016	190	272	13.6	2.7	159	1.0 B	3.2	0.35 U	0.67 JB	793 B	23.6 B	6.2 U	8.4	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U
MW3	W-161011-PS-10	10/11/2016	233	268	46.8	1.8	12.7	1.1 B	1.5	0.35 U	1.7 JB	171 B	14.8 B	6.2 U	0.45	0.062 U	0.28 U	0.26 U	0.23 U	0.24 U
MW10	W-161013-PS-19	10/13/2016	156	186	14.6	0.035 UH	24.3	11.1 ^	5.5 B	0.46 J	1.7 JB	434 B	777	6.2 U	7300	5.4 H	0.28 U	0.79 J	0.79 J	5.7
MW12	W-161012-PS-13	10/12/2016	239	340	10.8	1.2 H	124	0.71 J	0.092 J	0.50 J	1.6 JB	10 JB	439 B	6.2 U	14	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U
MW17	W-161011-PS-08	10/11/2016	208	348	17.0	2.7	136	0.36 JB	0.080 U	0.80 J	0.76 JB	5.3 U	0.28 JB	6.2 U	0.015 U	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U
MW23	W-161011-PS-07	10/11/2016	194	230	32.3	1.9	8.1	0.54 JB	0.080 U	0.71 J	0.90 JB	5.3 U	0.38 JB	6.2 U	0.015 U	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U
MW28	W-161013-PS-16	10/13/2016	128	148	11.4	1.7 H	5.8	12.3 ^	0.28 JB	0.39 J	0.76 JB	9.8 JB	8.5	6.2 U	1900	0.060 UH	0.28 U	0.26 U	0.23 U	1.4 J
MW28 (Duplicate)	W-161013-PS-17	10/13/2016	125	142	11.4	1.7 H	5.6	12.3 ^	0.36 JB	0.38 J	0.61 JB	5.3 U	7.9	6.2 U	1200	0.060 UH	0.28 U	0.26 U	0.23 U	1.4 J
Unconfined Aquifer (Upper)																				
EW11S	W-161010-PS-04	10/10/2016	64.7	118	7.9	7.9	39.1	4.7 B	0.080 U	0.40 J	3.0 B	114 B	97.9 B	6.2 U	0.70	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U
EW13S	W-161014-PS-23	10/14/2016	296	236	25.1	0.035 U	11.8	34.7	40 B	18.5	30.6 B	15600 B	2360	8.4 J	4200	6.8	0.28 U	0.53 J	0.54 J	7.1
MW1	W-161012-PS-11	10/12/2016	86.2	92.0	7.5	0.45 H	5.2	0.59 J	0.16 J	0.46 J	0.67 JB	5.3 U	0.96 JB	6.2 U	0.12	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U
MW6S	W-161013-PS-22	10/13/2016	126	152	14.5	6.9 H	8.1	4.2 ^	0.080 U	0.71 J	19.7 B	2290 B	52.7	11.7 J	0.20	0.061 UH	0.28 U	0.26 U	0.23 U	0.24 U
MW10S	W-161013-PS-20	10/13/2016	83.7	100	6.1	0.035 UH	11.9	12.3 ^	0.12 JB	0.44 J	4.6 B	124 B	399	6.2 U	6600	8.4 H	0.28 U	0.30 J	0.23 U	4.6
MW13	W-161010-PS-02	10/10/2016	49.3	56.0	0.98 J	0.58 H F1	3.1 F1	1.9 B	0.080 U	0.87 J	2.3 B	23.2 JB	0.94 JB	6.2 U	0.37	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U
MW16	W-161012-PS-14	10/12/2016	33.1	24.0	2.4	0.30 H	2.2	0.58 J	0.080 U	0.40 J	1.7 JB	61.7 JB	5.3 B	6.2 U	0.18	0.061 U	0.28 U	0.26 U	0.23 U	0.24 U
MW21	W-161011-PS-09	10/11/2016	30.5	82.0	74.4	1.8	6.6	0.61 JB	0.080 U	0.38 J	1.8 JB	6.2 JB	0.44 JB	6.2 U	5.7	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U
MW22	W-161012-PS-12	10/12/2016	67.2	70.0	1.7	0.53 H	3.5	0.96 J	0.080 U	0.41 J	1.7 JB	85.4 JB	5.4 B	6.2 U	0.043 J	0.061 U	0.28 U	0.26 U	0.23 U	0.24 U
MW25	W-161010-PS-05	10/10/2016	31.1	52.0	17.5	1.6 H	2.8	0.44 JB	0.080 U	0.35 U	0.62 JB	5.4 JB	0.46 JB	6.2 U	0.23	0.062 U	0.28 U	0.26 U	0.23 U	0.24 U
MW25 (Duplicate)	W-161010-PS-06	10/10/2016	31.1	54.0	16.9	1.6	2.7	0.44 JB	0.080 U	0.35 U	0.71 JB	5.3 U	0.27 JB	6.2 U	0.17	0.066 U	0.28 U	0.26 U	0.23 U	0.24 U
MW29	W-161014-PS-24	10/14/2016	83.0	124	15.9	0.035 U	16.3	56.9 ^	0.32 JB	0.35 J	2.6 B	1970 B	3220	6.2 U	20000	32	0.28 U	0.98 J	1.6	11
MW30	W-161012-PS-15	10/12/2016	52.2	86.0	3.8	1.6 H	30.5	NA	0.084 J	0.35 U	1.1 JB	13.8 JB	67.3 B	6.2 U	3.8	0.062 U	0.28 U	0.26 U	0.23 U	0.24 U
MW31	W-161013-PS-18	10/13/2016	110	104	0.63 J	0.46 H	1.5	0.29 J^	0.11 JB	0.35 U	0.76 JB	5.3 U	0.25 U	6.2 U	3.7	0.062 UH	0.28 U	0.26 U	0.23 U	0.24 U

Notes:

- ¹ - Enforcement Standard (ES) criteria adapted from Table 1 referred to and incorporated by NR 140.10 with except of Iron, Manganese, Zinc, Chloride, and Sulfate (see note 3 below)
- ² - Preventive Action Limit (PAL) criteria adapted from Table 1 referred to and incorporated by NR 140.10 with except of Iron, Manganese, Zinc, Chloride, and Sulfate (see note 3 below)
- ³ - Enforcement Standard (ES) and Preventive Action Limit (PAL) criteria adapted from Table 2 referred to and incorporated by NR 140.12

mg/L - Concentrations listed with units of milligrams per liter

ug/L - Concentrations listed with units of micrograms per liter

J - Concentration was between the limit of detection and the limit of quantitation

U - Compound was not detected above the limit of detection

B - Compound was found in the blank and sample

F1 - MS and/or MSD recovery is outside acceptance limits

H - Analysis was performed beyond the specified holding time

^ - Instrument related quality control (QC) is outside of acceptance limits

NA - Not analyzed

- Concentration exceeds the ES

- Concentration exceeds the PAL

Well MW20 was not sampled due to the presence of LNAPL

Table 3.1

**Groundwater Analytical Data - Residential Wells and Onsite Supply Well
Penta Wood Products Superfund Site
Siren, Wisconsin**

Sample Location	Sample Identification	Date	Pentachlorophenol	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
		ES ¹	1	100	5	700	800	2000
		PAL ²	0.1	10	0.5	140	160	400
DW01	W-161010-PS-32	10/10/2016	0.025 J	0.063 U	0.28 U	0.26 U	0.23 U	0.24 U
DW01 (Dup)	W-161010-PS-33	10/10/2016	0.024 J	0.061 U	0.28 U	0.26 U	0.23 U	0.24 U
RW1	W-161010-PS-26	10/10/2016	0.020 J	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U
RW2	W-161010-PS-27	10/10/2016	0.015 U	0.061 U	0.28 U	0.26 U	0.23 U	0.24 U
RW3	W-161010-PS-29	10/10/2016	0.015 U	0.062 U	0.28 U	0.26 U	0.23 U	0.24 U
RW4	W-161010-PS-28	10/10/2016	0.015 U	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U
RW5	W-161010-PS-25	10/10/2016	0.015 U	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U
RW6	W-161010-PS-30	10/10/2016	0.015 U	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U

Notes:



- ¹ - Enforcement Standard (ES) criteria adapted from Table 1 referred to and incorporated by NR 140.10
- ² - Preventive Action Limit (PAL) criteria adapted from Table 1 referred to and incorporated by NR 140.10
- ug/L - Concentrations listed with units of micrograms per liter
- J - Concentration was between the limit of detection and the limit of quantitation
- U - Compound was not detected above the limit of detection
- Dup - Duplicate sample
-  - Concentration exceeds the ES
-  - Concentration exceeds the PAL

Table 4.1

**Initial Groundwater Characterization Analytical Data - Microcosm Study
Penta Wood Products Superfund Site
Siren, Wisconsin**

Parameters	Date Analyzed Units	12/4/2015	4/28/2016
		SB1	MW29
General Chemistry			
pH	S.U.	6.72	6.71
Ammonia-Nitrogen	mg/L	< 1.0	< 1.0
Orthophosphate-Phosphorus	mg/L	1.85	1.45
Semi-Volatile Organic Compounds			
Pentachlorophenol	µg/L	87	1430
Total Petroleum Hydrocarbons			
TPH(C ₉ -C ₃₆)	mg/L	0.176	1540
Total Metals			
Iron	µg/L	27600	10500
Manganese	µg/L	4480	2530
Dissolved Metals			
Dissolved Iron	µg/L	1010	270
Dissolved Manganese	µg/L	3340	2350

Notes:

- < - Compound not detected above the reporting limit
- S.U. - Standard units
- µg/L - Micrograms per liter

Table 4.2

**Initial Soil Characterization Analytical Data - Microcosm Study
Penta Wood Products Superfund Site
Siren, Wisconsin**

Parameters	Date Analyzed Units	12/3/2015	12/3/2015
		SB1	MW29
General Chemistry			
pH	S.U.	7.14	6.65
Ammonia-Nitrogen	mg/kg	ND	ND
Orthophosphate-Phosphorus	mg/kg	27.8	20.5
Percent Moisture	%	7.77	4.45
Percent Solids	%	92.2	95.6
Semi-Volatile Organic Compounds			
Pentachlorophenol	mg/kg	0.502	61
Total Petroleum Hydrocarbons			
TPH(C ₉ -C ₃₆)	mg/kg	< 50	153
Total Metals			
Iron	mg/kg	6880	8330
Manganese	mg/kg	79.9	94.56

Notes:

- ND - Not detected
- < - Compound not detected above the reporting limit
- J - Estimated value
- S.U. - Standard units
- mg/kg - Milligrams per kilogram
- % - Percent

Table 4.3

**Aerobic Biostudy SB1 Groundwater Analytical Data (3-Month Period) - Microcosm Study
Penta Wood Products Superfund Site
Siren, Wisconsin**

Parameters	Date Analyzed Units	1/11/2016 Start of Microcosm Study	3-Month Period		
			4/11/2016 Soil and Groundwater	4/11/2016 Soil, Groundwater, and Oxygen	4/11/2016 Soil, Groundwater, Oxygen, and Azide
Semi-Volatile Organic Compounds					
Pentachlorophenol	µg/L	289 / 302	9.29 J / < 50	3.10 J / < 50	362 / 282
Total Petroleum Hydrocarbons					
TPH(C ₉ -C ₃₆)	mg/L	4.61 / 5.10	< 0.5 / < 0.5	< 0.5 / < 0.5	4.45 / 4.28
Removal of Pentachlorophenol	%		94.2	95.2	-8.96
Removal of TPH(C ₉ -C ₃₆)	%		41.5	41.5	4.41

Notes:

< - Compound not detected above the reporting limit

µg/L - Micrograms per liter

mg/L - Milligrams per liter

J - Estimated value

All samples were analyzed in duplicate.

Table 4.4

**Aerobic Biostudy SB1 Soil Analytical Data (3-Month Period) - Microcosm Study
Penta Wood Products Superfund Site
Siren, Wisconsin**

Parameters	Date Analyzed Units	1/11/2016 Start of Microcosm Study	3-Month Period		
			4/11/2016 Soil and Groundwater	4/11/2016 Soil, Groundwater, and Oxygen	4/11/2016 Soil, Groundwater, Oxygen, and Azide
Semi-Volatile Organic Compounds					
Pentachlorophenol	mg/kg	0.087 J / 0.094 J	< 0.1 / < 0.1	< 0.1 / < 0.1	< 0.1 / < 0.1
Total Petroleum Hydrocarbons					
TPH(C ₉ -C ₃₆)	mg/kg	< 50 / < 50	< 50 / < 50	< 50 / < 50	< 50 / < 50

Notes:

J - Estimated value

< - Compound not detected above the reporting limit

mg/kg - Milligrams per kilogram

All samples were analyzed in duplicate.

Table 4.5

**Aerobic Biostudy SB1 Groundwater Analytical Data (6-Month Period) - Microcosm Study
Penta Wood Products Superfund Site
Siren, Wisconsin**

Parameters	Date Analyzed Units	1/11/2016 Start of Microcosm Study	6-Month Period		
			8/1/2016 Soil and Groundwater	8/1/2016 Soil, Groundwater, and Oxygen	8/1/2016 Soil, Groundwater, Oxygen, and Azide
Semi-Volatile Organic Compounds					
Pentachlorophenol	µg/L	289 / 302	< 50 / < 50	< 50 / < 50	92.7 / 110
Total Petroleum Hydrocarbons					
TPH(C ₉ -C ₃₆)	mg/L	4.61 / 5.10	< 0.5 / < 0.5	< 0.5 / < 0.5	< 0.5 / < 0.5
Removal of Pentachlorophenol	%		91.5	91.5	65.7
Removal of TPH(C ₉ -C ₃₆)	%		41.5	41.5	41.5

Notes:

< - Compound not detected above the reporting limit

µg/L - Micrograms per liter

mg/L - Milligrams per liter

J - Estimated value

% - Percent

All samples were analyzed in duplicate.

Table 4.6

**Aerobic Biostudy SB1 Soil Analytical Data (6-Month Period) - Microcosm Study
Penta Wood Products Superfund Site
Siren, Wisconsin**

Parameters	Date Analyzed Units	1/11/2016 Start of Microcosm Study	6-Month Period		
			8/1/2016 Soil and Groundwater	8/1/2016 Soil, Groundwater, and Oxygen	8/1/2016 Soil, Groundwater, Oxygen, and Azide
Semi-Volatile Organic Compounds					
Pentachlorophenol	mg/kg	0.087 J / 0.094 J	< 0.1 / < 0.1	< 0.1 / < 0.1	< 0.1 / < 0.1
Total Petroleum Hydrocarbons					
TPH(C ₉ -C ₃₆)	mg/kg	< 50 / < 50	< 50 / < 50	< 50 / < 50	< 50 / < 50

Notes:

J - Estimated value

< - Compound not detected above the reporting limit

mg/kg - Milligrams per kilogram

All samples were analyzed in duplicate.

Table 4.7

**Anaerobic Biostudy MW29 Groundwater Analytical Data (3-Month Period) - Microcosm Study
Penta Wood Products Superfund Site
Siren, Wisconsin**

Parameters	Date Analyzed Units	5/6/2016 Start of Microcosm Study	3-Month Period		
			8/3/2016 Soil and Groundwater	8/3/2016 Soil, Groundwater, and EVO	8/3/2016 Soil, Groundwater, Oxygen, and Azide
Semi-Volatile Organic Compounds					
Pentachlorophenol	µg/L	2460 / 1580	8900 / 9600	3250 / 1240	8600 / 7900
Total Petroleum Hydrocarbons					
TPH(C ₉ -C ₃₆)	mg/L	464 / 501	224 / 224	470 / 308	430 / 428
Removal of Pentachlorophenol	%		<1	<1	<1
Removal of TPH(C ₉ -C ₃₆)	%		37.3	29.7	9.19

Notes:

µg/L - Micrograms per liter

mg/L - Milligrams per liter

EVO - Emulsified Vegetable Oil

% - Percent

< - Less than value listed

All samples were analyzed in duplicate.

Table 4.8

**Anaerobic Biostudy MW29 Soil Analytical Data (3-Month Period) - Microcosm Study
Penta Wood Products Superfund Site
Siren, Wisconsin**

Parameters	Date Analyzed Units	5/6/2016 Start of Microcosm Study	3-Month Period		
			8/3/2016 Soil and Groundwater	8/3/2016 Soil, Groundwater, and EVO	8/3/2016 Soil, Groundwater, Oxygen, and Azide
Semi-Volatile Organic Compounds					
Pentachlorophenol	mg/kg	23.3 / 38.1	3.60 / 2.63	3.20 / 1.68	< 0.1 / < 0.1
Total Petroleum Hydrocarbons					
TPH(C ₉ -C ₃₆)	mg/kg	919 / 2370	1250 / 1440	932 / 983	1400 / 1660

Notes:

< - Compound not detected above the reporting limit

mg/kg - Milligrams per kilogram

EVO - Emulsified Vegetable Oil

All samples were analyzed in duplicate.

Table 4.9

**Anaerobic Biostudy MW29 Groundwater Analytical Data (6-Month Period) - Microcosm Study
Penta Wood Products Superfund Site
Siren, Wisconsin**

Parameters	Date Analyzed Units	5/6/2016 Start of Microcosm Study	6-Month Period		
			11/15/2016 Soil and Groundwater	11/15/2016 Soil, Groundwater, and EVO	11/15/2016 Soil, Groundwater, Oxygen, and Azide
Semi-Volatile Organic Compounds					
Pentachlorophenol	µg/L	2460 / 1580	15000 / 17800	1010 / 1610	6100 / 6500
Total Petroleum Hydrocarbons					
TPH(C ₉ -C ₃₆)	mg/L	464 / 501	105 / 237	149 / 264	295 / 213
Removal of Pentachlorophenol	%		<1	35	<1
Removal of TPH(C ₉ -C ₃₆)	%		42.3	51.0	25.40

Notes:

- µg/L - Micrograms per liter
- mg/L - Milligrams per liter
- EVO - Emulsified Vegetable Oil
- % - Percent
- < - Less than value listed

All samples were analyzed in duplicate.

Table 4.10

**Anaerobic Biostudy MW29 Soil Analytical Data (6-Month Period) - Microcosm Study
Penta Wood Products Superfund Site
Siren, Wisconsin**

Parameters	Date Analyzed Units	5/6/2016 Start of Microcosm Study	6-Month Period		
			11/15/2016 Soil and Groundwater	11/15/2016 Soil, Groundwater, and EVO	11/15/2016 Soil, Groundwater, Oxygen, and Azide
Semi-Volatile Organic Compounds					
Pentachlorophenol	mg/kg	23.3 / 38.1	18.3 / 22.4	11.0 / 10.5	4.69 / 9.53
Total Petroleum Hydrocarbons					
TPH(C ₉ -C ₃₆)	mg/kg	919 / 2370	1400 / 1360	1010 / 838	1950 / 1350

Notes:

< - Compound not detected above the reporting limit

mg/kg - Milligrams per kilogram

EVO - Emulsified Vegetable Oil

All samples were analyzed in duplicate.

Table 5.1

**Bio-Trap Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin**

Parameters	Sample Date: Units	5/23/2016 MW9	5/23/2016 EW11S	5/23/2016 MW20	5/23/2016 MW29
Biomass and ¹³C Incorporation					
Total Biomass	Cells/bead	2,280,000	1,100,000	380,000	1,920,000
¹³ C Enriched Biomass	Cells/bead	19,800	14,500	2,170	11,200
Average PLFA $\delta^{13}\text{C}$	‰	257	360	276	94
Maximum PLFA $\delta^{13}\text{C}$	‰	435	1192	399	232
¹³C Mineralization					
Inorganic Carbon $\delta^{13}\text{C}$	‰	-17	-14	-21	-20
$\%^{13}\text{C}$	%	1.09	1.09	1.08	1.08
Community Structure (% Total PLFA)					
Firmicutes	%	0.7	2.68	16.17	52.88
Proteobacteria	%	63.6	65.59	49.44	31.17
Anaerobic Metal Reducers	%	0.18	1.02	6.32	0
Actinomycetes	%	0.34	0.36	1.48	4.4
General	%	34.29	29.85	25.96	11.56
Eukaryotes	%	0.88	0.52	0.64	0

Notes:

 $\delta^{13}\text{C}$ - Del Carbon 13

PLFA - Phospholipid Fatty Acids

‰ - Parts per thousand

% - Percent

Appendix A

Historical Site Data

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane ug/L	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CaCO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
DW01	9/24/03	N	0.5 U		1 U		2		50 UJ			5 UJ		30	0.05 J	1 U	0.25 U	2.5 U	2.5 U	2.5 U		250	66.9		110.8	1.48	2 U		1.5
DW01	9/24/03	N2	0.5 U		1 U		1 U		50 UJ			5 U		40															
DW01	5/4/04	N	10.0 U		0.243 J		61.5 R		194 R	27300		108 R		2710 R	0.102 UB	5.00 U	0.109 J	5.00 U	0.153 J	5.00 U		292	49 =		309	1.8 J	7.9 R		1.54 J
DW01	5/4/04	N2			0.280 J		49.5 R		29.2 R					2590 R															
DW01	9/22/04	N														5.00 U	0.500 U	5.00 U	5.00 U	5.00 U									
DW01	9/28/04	N																											
DW01	11/1/04	N													1.08 =														
DW01	5/11/05	N	2.0 U												0.0962 U														
DW01	9/27/05	N													0.033 J	0.93 U	0.50 U	5.0 U	5.0 U	5.0 U					260 J				
DW01	5/31/06	N	2.0 U		1.0 UJ		140 J		50 UJ			4.0 UJ		1900 J	0.039 J	0.95 U	0.50 U	5.0 U	5.0 U	5.0 U		270 J	29 J		260 J	1.5 J	6.5		1.1 J
DW01	9/26/06	N	2.0 UJ		1.0 UJ		100		50 UJ			15 J		1500 J	0.11 U	0.93 U	0.50 U	5.0 U	5.0 U	5.0 U		230 J	21 J		230 J	0.67 J	13 J		2.1
DW01	5/10/07	N	2.0 UJ		1.0 UJ		100		100 UJ			10 UB		620 J	0.074 J	0.95 R	1.0 UJ	1.0 UJ	1.0 UJ	2.0 UJ		400 =	29		320	1.8	17 J		1.0 UB
DW01	9/19/07	N	2.0 UJ		0.63 J		89		100 UJ			2.4 J		1100	0.093 UJ	0.93 R	1.0 U	1.0 U	1.0 U	2.0 U		250 J	27		330 J	1.5 J	14 J		0.92 J
DW01	5/20/08	N													0.094 UJ	0.94 U	1.0 UJ	1.0 U	1.0 U	2.0 UJ									
DW01	10/23/08	N	2.0 UJ		2 UJ		205 J		642 J	33000 J		4.6 J		81.2 J	0.1 U	1 U	0.5 U	2.0 U	2.0 U	5.0 U		297 J	29.6		423 J	1.79 J	9.07		44.4
DW01	6/3/09	N													0.1 U	1.0 UJ	0.5 U	2.0 U	2.0 U	5.0 U									
DW01	10/8/09	N													0.1 UJ	0.994 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ									
DW01	5/19/10	N													0.1 U	1.0 U	0.4 U	5 U	5 U	5 U									
DW01	10/7/10	N													0.1 UJ	0.995 UJ	0.1 U	0.4 U	0.4 U	1 U									
DW01	6/30/11	N													0.1 U	0.999 U	0.1 U	0.4 U	0.4 U	1 U									
DW01	10/18/11	N													0.032 J	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
DW01	5/23/12	N													0.028 J	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
DW01	10/18/12	N													0.032 J	0.19 U H	0.50 U	1.0 U	1.0 U	2.0 U									
DW01	5/21/13	N													0.029 J	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
DW01	10/8/13	N													0.027 J	0.20 U	0.50 U	1.0 U	1.0 U	2.0 U									
DW01	5/13/14	N													0.057 J														
DW01	9/25/14	N													0.54 J	0.060 UJ	0.24 U	0.23 U	0.22 U	0.43 U									
DW01	4/21/15	N													0.023 J	0.061 U	0.35 U	0.25 U	0.23 U	0.52 U									
DW01	10/15/15	FD													0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
DW01	10/15/15	N													0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
DW01	4/5/16	N													0.095 Jp	0.14 J	0.35 U	0.25 U	0.23 U	0.52 U									
DW01	4/5/16	FD													0.097 Jp	0.062 U	0.35 U	0.25 U	0.23 U	0.52 U									
EW02D	4/14/16	N	0.15 J	0.49 J		3.8		299			384		46.7	1 U	1.7	0.35 U	0.25 U	0.23 U	0.52 U		55.0	12.1		70.6	0.70	8.7		4.8	
EW02S	4/14/16	N	0.094 J	0.49 U		1.4 J		50.2 J			39.3		7.3 U	0.1 U	2.5	0.35 U	0.25 U	0.23 U	0.52 U		30.0	10.5		41.2	1.0	7.0		2.7	
EW03D	4/18/16	N	1.3	2.7 J		9.8		12500 B			1780		398	0.071 J	2.4	0.35 U	0.33 J	0.23 U	3.6		184	13.4		169	0.035 UH	25.6		10	
EW03S	4/18/16	N	0.15 J	0.53 J		10.8		1050 B			3530		7.3 U	0.1 U	12	0.70 U	0.50 U	0.46 U	5.2		88.0	73.8		220	0.29 H	39.1		59.1	
EW04D	4/18/16	N	0.33 J	0.49 U		2.2		3060 B			316		172	0.05 U	0.16 J	0.35 U	0.25 U	0.23 U	0.52 U		129	16.5		131	1.9	6.0		5.3	
EW04S	4/18/16	N	0.12 J	0.49 U		2.4		567 B			385		7.3 U	0.23	0.25	0.35 U	0.25 U	0.23 U	0.52 U		81.0	9.9		98.0	0.92	8.1		7.2	
EW05D	4/20/16	N	0.44 J	2.7 J		8.6		8430			1980		372	0.04	19	0.35 U	0.79 J	0.95 J	6.7		145 B	14.4		171	0.035 U	17.0		36.7	
EW07D	4/12/16	N	0.59	0.49 U		1.1 J		122			210		7.3 U	0.1 J	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		127	23.7		174	6.6 H	8.4		1.2	
EW10D	4/20/16	N	1.1	6.5		10.3		3350			2200		81.0	0.28	19	0.35 U	1.4	1.8	12		135 B	25.7 F1		180	0.057 JF1	21.8 F1		41.8	
EW10D	4/20/16	FD	1.3	7.6		12.1		3720			2170		114	0.24	19	0.35 U	1.3	1.9	12		136 B	23.9		184	0.060 J	20.3		41.0	
EW10D	4/20/16	RB		0.49 U		0.89 J		16.0 U			1.1 U		7.3 U	0.134 UB	0.065 U	0.35 U	0.25 U	0.23 U	0.52 U										
EW11D	4/14/16	N	0.080 U	0.49 U		1.1 J		657			22.6		46.4	0.140 UB	0.063 U	0.35 U	0.25 U	0.23 U	0.52 U		187	12.7		282	2.0	155		1.0	
EW11D	4/14/16	FD	0.080 J	0.49 U		0.75 U		825			27.4		55.9	1.51	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		190	12.8		276	2.0	198		1.2	

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane ug/L	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CaCO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
EW11D	7/19/16	N	1.1	0.49 U		2.7 B		292			54.5		50		0.201	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		151	9.1	242		2.2	112 F1	1.9	
EW11S	4/14/16	N	0.080 U	0.49 U		3.4		451			63.5		7.3 U		0.0952 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		48.6	7.0		100	8.9	45.1		5.2
EW11S	7/19/16	N	0.080 U	0.49 U		2.3 B		84.2 J			37.3		7.3 U		0.053 J	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		65.7	7.9	106		6	36.5	2.7	
EW11S	10/10/16	N	0.080 U	0.40 J		3.0 B		114 B			97.9 B		6.2 U		0.70	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U		64.7	7.9	118		7.9	39.1	4.7 B	
EW12D	4/20/16	N	4.0	2.2 J		1.3 J		3820			1620		7.3 U		0.068 J	12	0.35 U	0.58 J	0.50 J	7.2		90.0 B	5.4		80.4	0.035 U	6.4		15.7
EW13D	4/19/16	N	1100	1.6 J		0.75 U		7660 B			956		11.7 J		0.035 J	13	0.35 U	0.27 J	0.32 J	4.8		180	15.1		167	0.093 J	2.0		20.7
EW13S	4/19/16	N	4.9	23.2		37.7		14100 B			2340		13.8 J		0.043 J	2.0	0.35 U	0.26 J	0.23 U	4.2		370	20.7		229	0.035 U	9.6		36.6
EW13S	7/26/16	N	20	58.9		133		45600			2580		52.2		0.049 J	4	0.35 U	0.31 J	0.35 J	4.4		312	21.2	292		0.035 U	7.8	32.6 ^	
EW13S	10/14/16	N	40 B	18.5		30.6 B		15600 B			2360		8.4 J		4200	6.8	0.28 U	0.53 J	0.54 J	7.1		296	25.1	236		0.035 U	11.8	34.7	
EW14D	4/19/16	N	4.2	0.49 U		3.4		301			77.4		17.5 J		0.050 J	3.5	0.35 U	0.25 U	0.23 U	2.4		137	12.0		139	0.48 H	7.2		6.5
EW14D	4/19/16	FD	3.5	0.49 U		0.75 U		292			77.8		17.2 J		0.055 J	3.1	0.35 U	0.25 U	0.23 U	2.4		136	11.9		145	0.48 H	7.1		6.3
MW1	10/9/97	FD	10 U	1		2.3		3.5 U		20 J			1180		0.048 J		0.1 U	1 U	1 U	1 U		190	16			4.5	5.8		43.5
MW1	10/9/97	FD2				2 U		70.9							0.023 J														
MW1	10/9/97	N	10 U	2		2 U		61.6		20 U			1070		0.11 U		0.1 U	1 U	1 U	1 U		190	18			6.5	6.3		20
MW1	10/9/97	N2		2		2 U		2 U							0.048 J		0.1 U	1 U	1 U	1 U									
MW1	4/24/01	N	0.11 U	0.1 U		2.4		33		9830			642		0.035 J	5.6 U	0.1 U	1 U	1 U	1 U		140	24		218	6.5 =	13		3.89
MW1	4/24/01	N2	0.11 U			1 U		25 U		25 U			15 U		0.27 R											6.5			
MW1	9/11/01	N	10 U	0.5		0.7 J		4 J		35 U			0.79 J		0.093 UJ	0.24 U	0.44 U	0.5 U	0.4 U	1.2 U		130	10		170	2.6	8.2 U		3.9
MW1	9/11/01	N2				1.3		25 U		4000			450		0.066 J														
MW1	5/14/02	N				1.4 U		1.6 J		11.2 U			0.48 J		0.060 J														
MW1	8/6/02	N	10.0 U	0.067		1.4 U		7.6 J		1700			180			5 U	1 U	5 U	5 U	5 U		170	7.4		190	0.15 U	7.9		2.6
MW1	8/6/02	N2	10.0 U	0.063		1.7 J		0.3 U		11 U			0.95 J			5 U	1 U	5 U	5 U	5 U		160	7.3		190	0.15 U	7.7		3.7
MW1	8/6/02	N3				1.8 J		9.5 J		2200			230		0.1 U														
MW1	8/6/02	N4				1.4 U		0.3 U		11 U			2.2 J		0.1 UJ														
MW1	4/29/03	N	0.5 U	0.1 U		1 U		14		3160			217		0.1 UJ	7.4 U	0.5 U	5 U	5 U	5 U		174	4.3		187	2.6	10		3.2
MW1	4/29/03	N2	0.5 U			1 U		1 U		25 U			5 U		0.1 UJ														
MW1	9/24/03	N	0.5 U	0.13		1 J		21		7000 J			416			1 U	0.25 U	2.5 U	2.5 U	2.5 U		157	3.3		68.25	2.61	2 U		8.4
MW1	9/24/03	N2	0.5 U			1 U		1 J		100 J			36																
MW1	5/4/04	N	0.863 J	1.06 J		0.346 J		5.73 R		790 R	13900		135 R		0.1 UJ	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U		147	4.3 R		158	2.1 J	2.0 R		6.37 J
MW1	5/4/04	N2				0.190 J		0.785 R		29.9 R			15.0 R		0.1 UJ														
MW1	9/21/04	FD	10.0 U	0.442		0.470 J		13.6 J		1210			158		0.1 U	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U		140	2.7 =		1960	1.8 J	4.5 J		7.98
MW1	9/21/04	FD2				0.227 J		0.707 J		21.0 J			3.07 J		0.1 U														
MW1	9/21/04	N	10.0 U	0.348		0.353 J		8.41 J		838			103		0.1 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U		130	2.7 =		776	1.8 J	5.2 J		6.75
MW1	9/21/04	N2				0.218 J		0.605 J		18.0 J			2.60 J		0.1 U														
MW1	5/10/05	N	2.0 U	0.12		1.0 U		18		3800			360			0.92 U	0.50 U	5.0 U	5.0 U	5.0 U		110 J	3.6 J		140 J	1.7 J	14 R		3.7 R
MW1	5/10/05	N2				1.0 U		10 U		50 U			10 U		0.1 U														
MW1	9/29/05	N	2.0 U	0.12		1.0 J		23 J		4800 J			400 J		0.1 U	1.0 U	0.50 U	5.0 U	5.0 U	5.0 U		110 J	6.2 J		160 J	1.9 J	16 R		2.4 J
MW1	9/29/05	N2				1.0 UJ		10 UJ		50 UJ			3.8 J		0.039 J														
MW1	5/31/06	N	2.0 U	0.049 J		1.0 UJ		10 UJ		50 UJ			10 UJ		0.040 J	1.0 U	0.50 U	5.0 U	5.0 U	5.0 U		110 J	2.3 J		100 J	1.6 J	17		1.7 J
MW1	5/8/07	N	2.0 UJ	0.11 J		1.0 UJ		10 UJ		100 UJ			6.3 J		0.031 R	1.0 R	1.0 U	1.0 U	1.0 U	2.0 U		190 =	2.2 J		130	1.9	15 J		1.9
MW1	9/18/07	N	2.0 UJ	0.093 UJ		1.0 UJ		10 UJ		100 UJ			10 UJ		0.096 UJ	0.93 R	1.0 U	1.0 U	1.0 U	2.0 U		110 J	9.4		170 J	3.0 J	12 J		1.1 J
MW1	10/21/08	N	2.0 UJ	0.42 UJ		2 U		10 UJ		388	21200		10 U		0.017 J	1.00 U	0.50 U	2.0 U	2.0 U	5.0 U		109	3.91		223 J	1.62 J	6.19		3.38 J
MW1	4/12/16	N	0.080 U	0.49 U		0.75 U		19.9 JB			1.4 JB		7.3 U		0.019 J	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		79.9 B	5.1		102	0.53	5.2		0.73 J
MW1	7/20/16	N	0.080 U	0.49 U		0.75 U		16.0 U			1.1 U		7.3 U		0.035 J	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		82.4	5.6	30		0.53	5.2	0.83 J	
MW1	10/12/16	N	0.16 J	0.46 J		0.67 JB		5.3 U			0.96 JB		6.2 U		0.12	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U		86.2	7.5	92		0.45 H	5.2	0.59 J	

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Arsenic (dissolved)	Arsenic	Copper (dissolved)	Copper	Iron (dissolved)	Iron	Magnesium	Manganese (dissolved)	Manganese	Zinc (dissolved)	Zinc	Pentachlorophenol	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, hydroxide (as CaCO3)	Alkalinity, total (as CaCO3)	Chloride	Hardness, carbonate	Hardness	Nitrate (as N)	Sulfate	TOC averages	Total organic carbon (TOC)
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
MW2	10/9/97	N	10 U	1 U		2 U		10.2 J		20 J			50.6		0.033 J		0.1 U	1 U	1 U	1 U		300	3.5			1.1	17		2.6
MW2	10/9/97	N2		1 U		2 U		11.4 J							0.027 J		0.1 U	1 U	1 U	1 U									
MW2	4/5/00	N		0.5 U											0.035 J	10 U													
MW2	6/18/01	N	0.14	0.1 U		0.37 J		25 U		24 U			8.3		0.045 J	5 U	0.1 U	1 U	1 U	1 U		36	5.73		66	38 =	105		5.57
MW2	6/18/01	N2	0.14			6.7		109		39900			1230		0.094 UJ											38			
MW2	9/12/01	N	10 U	0.51		3.9		110		29000			1200		0.095 U	0.24 U	0.44 U	0.5 U	0.4 U	1.2 U		49	6.2		140	2.3	10		4.2
MW2	9/12/01	N2				0.29 U		2.2 U		35 U			57		0.094 UJ														
MW2	8/6/02	N	10.0 U	0.12		6.4		30		10000			420		0.095 U	5 U	1 U	5 U	5 U	5 U		66	3		98	0.15 U	10		3.2
MW2	8/6/02	N2				1.4 U		0.3 U		48			18		0.029 J														
MW2	9/24/03	N	0.5 U	0.28		8		100		41300 J			1180		0.031 J	0.99 U	0.25 U	2.5 U	2.5 U	2.5 U		80	1 J		106.2	2.02	3 J		2.3
MW2	9/24/03	N2	0.5 U			1 U		16		3030 J			443		0.040 J														
MW2	9/21/04	N	10.0 UJ	1.26		4.03 J		87.2 J		25800 J			972 J		0.097 U	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U		110 J	12 J		921 J	1.4 J	4.0 R		5.23 R
MW2	9/21/04	N2				0.237 J		3.10 J		662			22.2 J		0.051 J														
MW2	9/28/05	N	2.0 U	2.2 =		6.7		140 J		40000 J			1300 J		0.043 J	0.98 U	0.50 U	5.0 U	5.0 U	5.0 U		150 J	5.6 J		270 J	0.10 UJ	27 R		2.5 J
MW2	9/28/05	N2				1.0 UJ		2.5 J		65 J			9.3 J		0.015 U														
MW2	9/26/06	N	2.0 UJ	2.3		1.0 U		10 UJ		50 U			2.6 UB		0 U	1.7 U	0.50 U	5.0 U	5.0 U	5.0 U		160 J	1.6 J		220	0.12 J	20 J		3.1
MW2	9/19/07	N	2.0 UJ	3.7 J		0.62 J		10 UJ		100 UJ			6.5 J			0.97 R	1.0 U	1.0 U	1.0 U	2.0 U		160 J	3.6		200 J	0.22 J	16 J		2.1 J
MW2	10/21/08	N	2.0 UJ	1.60 J		2 U		10 UJ		424 J	27900		5.20 J		2	1.00 U	0.5 U	2.0 U	2.0 U	5.0 U		138	3.17		276 J	1.10 J	12.90		2.59 J
MW2	10/6/09	N	0.83 UJ	2.21 J		2 UJ		10 UJ		129 J	19000 J		10 UJ		0.9 J	0.996 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ		122 J	1.97 J		190.6 J	0.81 J	11.6 J		5.33 J
MW2	10/6/10	N	1.3 U	0.1 U		2 U		8 U		43 J	4680		9.4 J		1 U	1.0 U	0.1 U	0.4 U	0.4 U	1 U		62	0.6 J		52.5	1.01 J	4.2 J		24
MW2	10/19/11	N	0.50 U	0.097 U		2.0 U		2.2 J+		47 J	9400 B		3.7 J		1 U	0.20 U	0.50 U	1.0 U	1.0 U	2.0 U		63	7.7		93.60	0.50 J	33		1.0 U
MW2	10/16/12	N	0.50 U	0.33		0.82 J		6.2 J		810	8800 =		25		0.1 U	0.20 U	0.50 U	1.0 U	1.0 U	2.0 U		54	4.1		91.2	0.90 J	32 J		6.7
MW2	10/9/13	N	0.50 U	0.94 J		2.0 UJ		10.0 UJ		50 UJ	6900 J		10 UJ		9.5	0.21 U	0.50 U	1.0 U	1.0 U	2.0 U *		39 J	2.8			2.9 J	28		4.5 J
MW2	10/9/13	N2													0.1 U														
MW2	9/24/14	N	0.070 U	0.32	0.18 U		0.75 U		16 U			1.4 J		7.3 U	0.1 U	0.061 U	0.24 U	0.23 U	0.22 U	0.43 U		62	0.69 J	68		0.73	2.4	0.50 U	
MW2	10/14/15	N	0.080 U	0.49 U		0.75 J		56.7 J			2.9 J		7.3 U		0.05 U	0.060 U	0.35 U	0.23 U	0.25 U	0.52 U		50.7 B	0.55 J	60.3		0.63	2.1	1.3	
MW2	4/14/16	N	0.080 U	1.3 J		20.1		6580			171		19.7 J		0.05 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		34.4	0.51 J		49.0	0.38	1.8		3.6
MW3	10/8/97	N	10 U	1 U		2 U		2 U		257			10.9		0.1		0.1 U	1 U	1 U	1 U		370	42 J			4.4 J	16		1.2
MW3	10/8/97	N2		1 U											0.04 U		0.1 U	1 U	1 U	1 U									
MW3	4/4/00	N		0.6 U																									
MW3	4/25/01	N		0.11 U		1 U		25 U		147			7.3		0.11 U	6.1 U	0.1 U	1 U	0.46	1 U		442	47		544	4.42	11		1 U
MW3	4/25/01	N2				1 U		25 U		142			7.9		0.11 U	6.1 U											4.42 =		
MW3	9/13/01	N	10 U	0.092 J		0.29 U		2.2 U		930			31		0.11 U	0.26 U	0.44 U	0.5 U	0.4 U	1.2 U		440	58		480	4	14		1.1
MW3	9/13/01	N2				0.35 J		2.2 U		2400			31		0.0252 UB														
MW3	8/7/02	N	10.0 U	0.11		1.7 J		2.3 J		480			15 J		0.398	5 U	1 U	5 U	5 U	5 U		420	69		540	0.15 U	16		1.4
MW3	8/7/02	N2				1.9 J		0.58 J		160			12 J		0.0962 U														
MW3	9/23/03	N	2.5	0.31		1 U		1 J		150			5 U		0.11 U	1.1 U	0.25 U	2.5 U	2.5 U	2.5 U		357	52.4		160	4.43	2 U		1.6
MW3	9/23/03	N2	2.5												0.11 U														
MW3	9/24/03	N				1 U		1 U		1 U			8 J		0.11 UJ														
MW3	9/21/04	N	5.71 J	0.367		0.189 J		356 J		278 J			6.45 J		0.11 U	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U		430 J	62 J		3250 J	3.5 J	8.9 R		2.16 R
MW3	9/21/04	N2				0.119 J		1.91 J		137 J			4.99 J		0.092 UJ														
MW3	9/28/05	FD													0.093 UJ		0.50 U	5.0 U	5.0 U	5.0 U									
MW3	9/28/05	N	2.0 U	0.20 J		1.0 U		4.9 J		23000 J			93 J		0.095 UJ	0.93 U	0.50 U	5.0 U	5.0 U	5.0 U		370 J	62 J		490 J	3.3 J	24 R		1.4 J
MW3	9/28/05	N2				1.0 U		3.0 J		120 J			6.7 J																
MW3	10/21/08	N	4.90 J	0.10 UJ		2.00 U		10 UJ		2140	58700		15.20 J		0.1 U	3.13 U	0.50 U	2.0 U	2.0 U	5.0 U		513	60.50		836	2.73 J	15.20		18 J

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane ug/L	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CaCO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l		
MW3	10/7/09	N	21 J	0.1 UJ		2 UJ		10 UJ		722 J	46000 J		12.4 J		0.1 UJ	0.997 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ		482 J	53.8 J		581.46 J	2.55 J	11 J		3.42 J		
MW3	10/5/10	N	1.6	0.1 U		2 U		10 U		805	69100		12 J		0.1 UJ	1.0 U	0.1 U	0.4 U	0.4 U	1 U		510	67.2		906	3.62	19.8 J		2.2 J		
MW3	10/18/11	N	140	0.58		0.76 J		2 U		510	44000 B		41		0.1 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		510	64		531.00	3.3	16		2.9		
MW3	10/16/12	N	13	0.46		0.59 J		10 U		260	41000 =		8.3 J		0.1 U	0.20 U	0.50 U	1.0 U	1.0 U	2.0 U		460	69		493	3.6 J	17 =		2.4		
MW3	10/8/13	N	4.3	0.38		0.088 J		10.0 U		50 U	42000 B		8.3 J		0.1 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		390	70			3.5 J	16		1.6		
MW3	9/25/14	N	15	0.35	0.18 U		0.75 U		160 B			7.6		7.3 U	0.095 U	0.060 U*	0.24 U	0.23 U	0.22 U	0.43 U		290	72	360		2.1	12	0.91 J			
MW3	10/15/15	FD	5.7	0.49 U		1.2 J		56.6 J			7.9		7.3 U		0.097 U	0.060 U	0.35 U	0.23 U	0.25 U	0.52 U		258 B	52.3	312		1.7 J	11.2 F1	1.2			
MW3	10/15/15	N	5.1	0.49 U		0.93 J		58.2 J			7.4		7.3 U		0.037 J	0.061 U	0.35 U	0.23 U	0.25 U	0.52 U		258 B	52.5	322		1.7 J	11.1	1.1			
MW3	4/5/16	N	4.4	0.49 U		1.4 JB^		716			20.4 B		7.3 U		0.057 J	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		224 B	48.2		299	1.4	10.1		0.98 J		
MW3	4/5/16	FD	4.2	0.49 U		0.99 JB^		514			18.6 B		7.3 U		0.094 UJ	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		221 B	48.6		283	1.4	10.0		0.94 J		
MW3	7/21/16	N	2.5	0.49 U		0.75 U		317 B			16.2		7.3 U		0.095 U	0.061 U	0.35 U	0.25 U	0.23 U	0.52 U		215	45.5	248		1.4	9.2	1			
MW3	10/11/16	N	1.5	0.35 U		1.7 JB		171 B			14.8 B		6.2 U		0.45	0.062 U	0.28 U	0.26 U	0.23 U	0.24 U		233	46.8	268		1.8	12.7	1.1 B			
MW4	10/9/97	N	139	1 U		2 J		2 U		35.9 J			55.9		0.094 UJ		2	3	1	3		94	7.3			0.1 U	6.3		12.3		
MW4	10/9/97	N2		1 U		2 U		2.4 U							0.097 U		2	3	1	3											
MW4	4/4/00	N		0.5 U											0.094 U	10 U															
MW5	10/10/97	FD	10 U	31000 J		4.3		26.2 J		5070			15500		0.095 U		0.1 U	2	4	18		370	50			0.1 U	16		160		
MW5	10/10/97	FD2				4.6		4835 J							0.015 U																
MW5	10/10/97	N	10 U	28000 J		3.8		48.5 J		4860			12900		0.015 U		0.1 U	3	5	21		370	50			0.1 U	15		115		
MW5	10/10/97	N2		28000 E		3.2		24 J							0 U		0.1 U	3	5	21											
MW5	4/7/00	N		20600 =												76 U															
MW5	4/26/01	N	0.4	20600		5.6		74		20400			11200		1 U	38	0.22	0.84	1.8	8.1		352	42		349	0.13 U	28		43		
MW5	4/26/01	N2	0.4			3.9		25 U		7630			11300		0.1 J																
MW5	9/13/01	N	10 U	6300		3.7		5.1 J		4100			8500		0.1 U	23	0.44 U	0.54 J	0.78 J	4.3		270	29		240	0.17 J	22		27		
MW5	9/13/01	N2				8.2		100		26000			8500		0.05 U																
MW5	8/7/02	N		510 J		4.1		28		34500			8130		0.094 J	3.2 J	1 U	5 U	5 U	5 U		220	26		4 U	0.15 U	21		25		
MW5	8/7/02	N2				2 J		1.5 J		7900			7840		0.04 U																
MW5	9/25/03	N	0.47 J	1100		4		50		35100			9450		0.11 U	2.5	0.25 U	2.5 U	2.5 U	2.5 U		228	22.1		78.48	0.05 U	20		6.2		
MW5	9/25/03	N2	0.47 J			3		7		13400			8320		0.11 U																
MW5	9/22/04	N	10.0 UJ	194		0.488 J		17.3 J		30500			7150		0.0952 U	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U		250 J	29 J		1490 J	0.01 R	24 R		18.8 R		
MW5	9/22/04	N2		214 E		0.612 J		1.44 J		7480 J			5650 J		2.18																
MW5	9/28/05	N	2.3	1100 =		1.0 UJ		6.0 J		18000 J			7600 J		0.0962 U	1.8	0.50 U	5.0 U	5.0 U	5.0 U		260 J	18 J		480 J	0.10 UJ	35 R		7.4 J		
MW5	9/28/05	N2				1.0 UJ		10 UJ		19000 J			7600 J		0.11 U																
MW5	9/26/06	N	8.7 J	460 =		1.0 UJ		10 UJ		23000 J			8000 J		0.11 U	1.4 U	0.50 U	5.0 U	5.0 U	5.0 U		290 J	16 J		370	0.10 J	27 J		6.6		
MW5	9/20/07	N	9.8	31 J		1.0 UJ		10 UJ		25000			7600		0.11 UJ	0.74 R	1.0 U	1.0 U	1.0 U	2.0 U		230 J	13		270 J	0.10 U	39 J		4.1 J		
MW5	10/22/08	N	11 J	206		2 UJ		10 UJ		10500 J	31400 J		9700 J		0.11 U	1 U	0.5 U	2.0 U	2.0 U	5.0 U		267 J	8.68		357 J	0.05 U	24.8		30.5		
MW5	10/7/09	N	17 J	33.3 J		2 UJ		10 UJ		6000 J	33600 J		11800 J		0.092 UJ	0.998 UJ	0.1 UJ	0.4 UJ	0.4 UJ	0.14 J		256 J	8.59 J		344.62 J	0.05 UJ	55.1 J		3.5 J		
MW5	10/6/10	N	4.1	39.8 J		3.36 J		8 U		3030	43600		12600		0.093 UJ	1.0 U	0.1 U	0.4 U	0.4 U	1 U		274	11.4 J		437	0.10 UJ	79.4		4.2		
MW5	10/19/11	N	38 J	0.97		1.0 J		2 U		2600	40000 B		11000		0.097 UJ	0.20 U	0.50 U	1.0 U	1.0 U	2.0 U		260	15		397.00	0.10 U	150		2.6		
MW5	10/17/12	N	17	0.59 J		0.57 J		10 U		2700	29000 =		7000			0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		180	11		302	0.10 U H	130 =		1.8		
MW5	10/10/13	N	19	0.60		0.39 J		10.0 UJ		2200 J	20000 J		4700 J		0.1 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		150 B	9.2 J			0.10 UJ	140 J		1.8		
MW5	9/24/14	FD	10	12	0.42 J		0.75 U		1200 B			2200		7.3 U	0.1 UJ	0.061 U	0.24 U	0.23 U	0.22 U	0.43 U		97	4.3	150		0.12	48	0.50 U			
MW5	9/24/14	N	12	12	0.41 J		0.75 U		1200 B			2200		7.3 U	0.1 UJ	0.061 U	0.24 U	0.23 U	0.22 U	0.43 U		100	4.3	150		0.14	48	2.3			
MW5	10/14/15	N	1.8 B	0.49 U		0.75 U		954			2230		7.3 U		0.1 U	0.060 U	0.35 U	0.23 U	0.25 U	0.52 U		98.7 B	12.7	159		0.053 J	48.9	3.3			
MW5	4/7/16	N	4.3	0.49 U		0.75 U		931			1990		7.3 U		0.1 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		72.0 B	12.7		113	0.97 H	38.0		4.6 B		
MW5	4/7/16	FD	4.9	0.49 U		0.75 U		940			2070		7.3 U		0.1 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		71.3 B	12.5		113	0.96	37.6		4.5 B		

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Arsenic (dissolved)	Arsenic	Copper (dissolved)	Copper	Iron (dissolved)	Iron	Magnesium	Manganese (dissolved)	Manganese	Zinc (dissolved)	Zinc	Pentachlorophenol	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, hydroxide (as CaCO3)	Alkalinity, total (as CaCO3)	Chloride	Hardness, carbonate	Hardness	Nitrate (as N)	Sulfate	TOC averages	Total organic carbon (TOC)	
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
MW6	4/19/16	N	0.78	0.49 U		5.2		282			5.6		9.0 J		0.095 U	0.063 U	0.35 U	0.25 U	0.23 U	0.52 U		183	35.0		245	10.2 H	26.3		6.2	
MW6	4/19/16	FD		0.49 U		0.75 U		16.0 U			3.2 J		7.3 U		0.097 U	0.066 U	0.35 U	0.25 U	0.23 U	0.52 U										
MW6S	10/9/97	N	10 U	1 U		5.1		473		20 U			4720		0.015 J		0.1 U	1 U	1 U	1 U		62	72 J			4.5	0.9		1.6	
MW6S	10/9/97	N2		1 U		2 U		2 U							0.095 U		0.1 U	1 U	1 U	1 U										
MW6S	4/26/01	N	0.12 U	2.5		15		202		82800			1950		0.095 UJ	5.4 U	0.1 U	1 U	1 U	1 U		148	14		285	0.87	12		5.29	
MW6S	4/26/01	N2	0.12 U			0.26		25 U		25 U			347		0.053 J															
MW6S	9/12/01	N	10 U	1.1		7.4		190		42000			1900		0.096 U	0.24 U	0.44 U	0.5 U	0.4 U	1.2 U		160	12		290	1.1	16		6.3	
MW6S	9/12/01	N2				0.58 J		3.1 J		35 U			800		0.095 U															
MW6S	8/7/02	N	270	88 J		5.5		69.1		7570			2210		0.015 U	5 U	1 U	5 U	5 U	5 U		270	17		4 U	0.15 U	18		5.8	
MW6S	8/7/02	N2				2.7		9.9 J		3330			1790		0.015 U															
MW6S	9/25/03	N	130	0.33		1 J		22		5900			1190		0.015 U	1 U	0.25 U	2.5 U	2.5 U	2.5 U		282	23.9		104	1.01	17		8.2	
MW6S	9/25/03	N2	130			1 J		9		1100			961		0 U															
MW6S	9/27/06	N	3.5 J	0.21		1.0 U		2.6 J		50 U			590			1.1 U	0.50 U	5.0 U	5.0 U	5.0 U		320 J	18		350	3.9 =	18		4.1	
MW6S	9/20/07	FD	2.7	0.14 J		1.0 UJ		10 UJ		390			190		1 U	0.93 R	1.0 U	1.0 U	1.0 U	2.0 U		230 J	29		330 J	4.7	36 J		5.2 J	
MW6S	9/20/07	N	3.0	0.099 J		1.0 UJ		10 UJ		510			200		0.1 U	0.93 R	1.0 U	1.0 U	1.0 U	2.0 U		230 J	30		320 J	4.7	34 J		4.7 J	
MW6S	10/23/08	N	2.0 UJ	2.65		2 UJ		4.4 J		438 J	6260 J		65.3 J		0.073 J	1 U	0.5 U	2.0 U	2.0 U	5.0 U		4.98 J	28.3		90 J	7.11 J	11		8.3	
MW6S	10/7/10	N	1.3 U	0.1 UJ		2 U		5 J		531	4780		19.7 J		0.1 U	1.0 UJ	0.5 UJ	2 U	2 U	5 U		11 UB	21.3		56.9	6.94 J	11 J		6.8	
MW6S	10/19/11	N	0.50 U	0.10 U		2.0 U		3.7 J		50 U	4400 B		14		0.05 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		15	17		45.60	5.3	9.8		1.0 U	
MW6S	10/17/12	N	0.50 U	0.10 U		0.54 J		10 U		50 U	4600 =		3.9 J		0.13	0.20 U	0.50 U	1.0 U	1.0 U	2.0 U		18	16		51.4	5.5 H	11 J		3.2	
MW6S	10/9/13	N	0.50 U	0.52 J		2.0 UJ		10.0 UJ		1500 J	6000 J		32 J		0.04 U	0.21 U	0.50 U	1.0 U	1.0 U	2.0 U *		5.0 UJ	29			9.0 J	9.5		8.0 J	
MW6S	10/9/13	N2													0.11 U											8.9 J				
MW6S	9/24/14	N	0.082 J	0.27	1.3 J		27		6000 B					41 B	0.11 U	0.062 U	0.24 U	0.23 U	0.22 U	0.43 U		22	9.3	100		3.6	7.3	0.50 U		
MW6S	10/14/15	N	0.080 U	0.49 U		2.5		16.8			1.4 J		7.3 U		0.100 U	0.061 U	0.35 U	0.23 U	0.25 U	0.52 U		12.5 B	10.8	76.4		3.6	6.7	3.4		
MW6S	4/19/16	N	0.080 U	0.51 J		4.7		831 B			15.4		7.3 U		0.266	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		42.0	7.4		70.6	4.8	6.3		18.2	
MW6S	7/25/16	N	0.080 U	0.49 U		3.4 B		118 B			6.1		7.3 U		0.0962 R	0.061 U	0.35 U	0.25 U	0.23 U	0.52 U		49.4	13.8	86		7.7 F1	8	3.7		
MW6S	10/13/16	N	0.080 U	0.71 J		19.7 B		2290 B			52.7		11.7 J		0.20	0.061 UH	0.28 U	0.26 U	0.23 U	0.24 U		126	14.5	152		6.9 H	8.1	4.2 ^		
MW7	10/14/97	N	10 U	1 U		2 U		6.2		622			13.4		0.11 U		0.1 U	1 U	1 U	1 U		350	7.6			4.9	6		1.6	
MW7	10/14/97	N2		1 U		2 U		2 U							0.11 U		0.1 U	1 U	1 U	1 U										
MW7	4/4/00	FD		0.5 U											0.11 UJ	10 U														
MW7	4/4/00	N		0.5 U											0.11 U	10 U														
MW7	4/25/01	N	4.65	0.1 U		1 U		25 U		352			5.4		0.093 UJ	5.2 U	0.1 U	1 U	1 U	1 U		352	8.36		388	3.63	6.54		2.8	
MW7	4/25/01	N2	4.65			1 U		25 U		154			6.6		0.093 UJ	5.2 U										3.63 =				
MW7	9/11/01	N	12	0.083 J		0.4 J		2.2 U		560			6.4		0.093 UJ	0.24 U	0.44 U	0.5 U	0.4 U	1.2 U		340	23		410	3	10		2	
MW7	9/11/01	N2	10 U	0.13 J		0.29 U		2.2 U		230			4.4			0.24 U	0.44 U	0.5 U	0.4 U	1.2 U		350	24		400	3	10		1.8	
MW7	9/11/01	N3				0.47 J		2.2 U		560			5.7		0.1 U															
MW7	9/11/01	N4				0.29 U		2.2 U		230			4.6		0.1 UJ															
MW7	8/7/02	N	10.0 U	0.03 J		1.5 J		0.3 U		730			6.5 J		0.15 J	5 U	1 U	5 U	5 U	5 U		390	21		450	0.15 U	10		1.5	
MW7	8/7/02	N2				1.4 U		0.3 U		300			4 J		0.1 UJ															
MW7	9/24/03	N	4.9	0.044 J		1 U		1 U		280 J			6 J		0.1 U	0.96 U	0.25 U	2.5 U	2.5 U	2.5 U		346	12.2		133.3	2.97	2 U		1.2	
MW7	9/24/03	N2	4.9			1 U		1 U		90 J			5 U		0.1 U															
MW7	9/22/04	N	10.0 UJ	9.18 E		1.00 UJ		1.09 J		1640 J			9.86 J		0.1 U	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U		300 J	7.2 J		1560 J	3.4 J	6.8 R		1.98 R	
MW7	9/22/04	N2		5.75		0.108 J		0.847 J		25.0 UJ			9.75 J		0.095 U															
MW7	9/27/05	N	2.0 UJ	0.12 U		1.0 U		10 U		1300			18		0.094 U	0.91 UJ	0.50 U	5.0 U	5.0 U	5.0 U		260 J	18 J		450	1.8 J	130 J		0.96 J	
MW7	9/27/05	N2				1.0 U		10 U		880			16 J		0.071 J															
MW7	9/26/06	N	4.3 J	0.087 J		1.0 U		10 U		50 U			68 J		0.095 U	0.92 U	0.50 U	5.0 U	5.0 U	5.0 U		280 J	15		390	1.8 =	110 =		2.4	

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane ug/L	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CaCO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l	
MW7	9/20/07	N	3.7	0.093 U		1.0 UJ		10 UJ		260			22		0.094 UJ	0.93 R	1.0 U	1.0 U	1.0 U	2.0 U		270 J	16		370 J	1.5	170 J		1.1 J	
MW7	10/22/08	N	110 J	0.1 U		2 UJ		4 J		926 J	37700 J		41.6 J		0.094 U	1 U	0.5 U	2.0 U	2.0 U	5 U		277 J	14.1		535 J	1.54 J	98.9		4.16	
MW7	10/22/08	N2													0.095 U														4.41	
MW7	10/7/09	N	2.4 J	0.403 J		2 UJ		10 UJ		687 J	32600 J		109 J		0.023 J	0.999 UJ	0.1 UJ	0.4 UJ	0.4 UJ	0.14 J		245 J	12.2 J		396.43 J	1.91 J	152 J		14.5 J	
MW7	10/6/10	N	28	0.1 U		2 U		8 U		989	38900		63.2		0.015 U	1.0 U	0.1 U	0.4 U	0.4 U	1 U		226	13.8 J		482	2.24 J	168		10.4	
MW7	10/19/11	N	15	0.098 U		0.48 J		2 U		81	21000 B		21		0.015 U	0.20 U	0.50 U	1.0 U	1.0 U	2.0 U		230	12		249.00	1.9 J	92		1.5 J	
MW7	10/17/12	N	2.2	0.096 U		2.0 U		10 U		230	21000 =		22		0 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		210	11		254	1.5 H	120 =		0.97 J	
MW7	10/9/13	N	2.2 B	0.094 U		0.34 J		10.0 UJ		10000 J	21000 J		74 J		0.19 U	0.50 U	1.0 U	1.0 U	2.0 U *		200 J	12			1.8 J	120		0.75 J		
MW7	10/9/13	N2													0.0935 U													1.8 J		
MW7	9/23/14	N	15	0.034 J	0.28 JB		0.75 U		260			33		30 B	0.293	0.060 U	0.24 U	0.23 U	0.22 U	0.43 U		200	9.0	240		1.9 H	110	0.96 J		
MW7	10/12/15	N	6.5 B	0.88 J		1.6 J		16.0 U			423		7.3 U		0.0962 U	0.060 U	0.35 U	0.23 U	0.25 U	0.52 U		228 B	8.3	229		1.5	46.2	0.85 J		
MW7	4/6/16	N	13	0.49 U		1.9 JB^		5270 B			117 B		36.2 B		0.11 U	0.065 U	0.35 U	0.25 U	0.23 U	0.52 U		212 B	10.3		237	1.7	25.7		0.58 J	
MW8	10/14/97	N	36.5	1 U		2 U		2 U		148			17.8		0.11 U		0.1 U	1 U	1 U	1 U		170	4.2			1.4	4.5		2.3	
MW8	10/14/97	N2		1 U		2 J		2 U							0.11 UJ		0.1 U	1 U	1 U	1 U										
MW8	4/5/00	N		0.5 U											0.11 U	10 U														
MW8	4/25/01	N	11.6	0.2		0.99		25 U		829			32		0.092 UJ	5 U	0.1 U	1 U	1 U	1 U		154	3.25		181	1.52	7.47		1.46	
MW8	4/25/01	N2	11.6			0.75		25 U		25 U			27		0.093 UJ															
MW8	4/25/01	N3				0.57		25 U		25 U			22		0.095 UJ															
MW8	9/11/01	N	10 U	0.062 J		1		2.2 U		70 J			18			0.24 U	0.44 U	0.5 U	0.4 U	1.2 U		150	3.8		170	1.5	7.6 U		1 J	
MW8	9/11/01	N2				1.2		2.2 U		350			19		0.1 U															
MW8	8/8/02	N	10.0 U	0.04 U		1.4 U		0.3 U		98			6.4 J		0.1 UJ	5 U	1 U	5 U	5 U	5 U		180	4.2		310	0.15 U	6		1.1	
MW8	8/8/02	N2				1.8 J		0.27 U		11 J			5.3 J		0.1 UJ															
MW8	9/25/03	N	8.9	0.047 J		1 U		1 U		140			8 J		0.1 U	0.95 U	0.25 U	2.5 U	2.5 U	2.5 U		182	11		69.57	2.61	2 U		1.7	
MW8	9/25/03	N2	9.2	0.11 U		1 U		1 U		50 U			8 J		0.1 U	1 U	0.25 U	2.5 U	2.5 U	2.5 U		184	11		69.44	2.6	2 U		2.3	
MW8	9/25/03	N3	9.2			1 U		1 U		240			8 J		0.1 U															
MW8	9/25/03	N4				1 U		1 U		50 U			6 J		0.095 U															
MW8	9/23/04	N	3.75 J	1.94 =		0.127 J		0.465 J		256			15.1		0.095 U	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U		200	15		1160	2.4 J	5.8 J		1.40	
MW8	9/23/04	N2				0.539 J		0.660 J		11.0 J			12.0 J		0.030 J															
MW8	9/28/05	FD	2.0 U	0.12 U		1.0 UJ		2.3 J		4500 J			56 J		0.095 UJ	0.93 U	0.50 U	5.0 U	5.0 U	5.0 U		160 J	19 J		200 J	2.0 J	19 R		1.0 J	
MW8	9/28/05	FD2				1.0 UJ		10 UJ		120 J			13 J		0.095 U															
MW8	9/28/05	N	2.6	0.031 J		1.0 UJ		3.8 J		4700 J			63 J		0.095 U	0.93 U	0.50 U	5.0 U	5.0 U	5.0 U		160 J	20 J		240 J	2.0 J	19 R		1.2 J	
MW8	9/28/05	N2				1.0 UJ		10 UJ		130 J			16 J		0.098 U															
MW8	9/20/07	N	2.0 UJ	0.093 U		0.61 J		10 UJ		210			13 J		0.095 U	0.93 U	1.0 U	1.0 U	1.0 U	2.0 U		180	21		260 J	1.5	76 J		1.1 J	
MW8	10/22/08	N	0.78 J	0.1 U		2 UJ		10 UJ		707 J	40400 J		13.1 J		0.015 U	1 U	0.5 U	2.0 U	2.0 U	5 U		178 J	24.3		496 J	1.92 J	73.1		16.1	
MW8	4/11/16	N	1.5	0.60 J		0.75 U		197 B			10.9 B		7.3 U		0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		174 B	18.0		421	1.3 H	201		0.26 J	
MW9	10/8/97	N	10 U	1 U		2 U		4.2 U		20 U			19.7		0.016 U		0.1 U	1 U	1 U	1 U		60	45			4.2	3.4		6.5	
MW9	10/8/97	N2		1 U											0.015 U		0.1 U	1 U	1 U	1 U										
MW9	4/5/00	N		0.6 =											0.015 U	10 U														
MW9	4/23/01	N	0.12 U	0.12		0.38		25 U		470			46		0.015 U	5.3 U	0.1 U	1 U	1 U	1 U		60	3.22		59	2.46 =	27		9.94	
MW9	4/23/01	N2	0.12 U												0.018 J												2.46			
MW9	4/24/01	N				0.28		25 U		25 U			34		0.015 U															
MW9	9/12/01	N	10 U	0.76		0.43 J		6.1 J		300			27		11 J	0.24 U	0.44 U	0.5 U	0.4 U	1.2 U		62	6.5		64	3.3	6.8 U		5.1	
MW9	9/12/01	N2				0.34 J		2.2 U		110			16		6.6 J															
MW9	8/6/02	N	10.0 U	0.54		1.4 U		1.6 J		200			14 J		6.4 J	5 U	1 U	5 U	5 U	5 U		64	11		95	0.15 U	22		8.4	
MW9	8/6/02	N2				1.4 U		0.3 U		11 U			6.3 J		9.6 J															

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane ug/L	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CaCO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
MW9	9/25/03	N	0.5 U	2.3		1 J		20		7400			229		20 J	1 U	0.25 U	2.5 U	2.5 U	2.5 U		59	4.4		32.83	2.36	24		6.5
MW9	9/25/03	N2	0.5 U			1 U		1 U		240			16		10 U														
MW9	9/22/04	N	10.0 UJ	2.92		0.134 J		2.07 J		231 J			16.5 J		4.60 J	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U		58 J	3.2 J		776 J	1.8 J	26 R		6.48 R
MW9	9/22/04	N2				0.265 J		2.88 J		125 U			8.51 J		14.9 J														
MW9	9/27/05	N	2.0 UJ			1.0 UJ		10 U		50 U			6.3 J		20 U	0.93 U	0.50 U	5.0 U	5.0 U	5.0 U		55 J	2.6 J		70	1.9 J	20 J		2.0
MW9	9/27/05	N2				1.0 UJ		10 U		50 U			5.4 J		20 U														
MW9	10/18/05	N		0.57																									
MW9	9/21/07	N	2.0 U	0.37 J		1.0 UJ		5.9 J		100 UJ			4.1 J		20 UJ	0.97 R	1.0 U	1.0 U	1.0 U	2.0 U		58 J	2.6		86 J	3.8	15 J		3.3 J
MW9	10/22/08	N	2.0 UJ	0.1 U		2 UJ		6 J		166 J	11600 J		10 UJ		20 UJ	1 U	0.5 U	2.0 U	2.0 U	5 U		55 J	3.44		113 J	2.48 J	14.9		11.2
MW9	5/18/10	N	1.3 U	0.073 J		2 UJ		10 UJ		120 UJ	6230 J		7.1 J		20 UJ	1.0 U	0.5 U	5 U	5 U	5 U		63 UB	2.63		67.9	2.42 J	11		25.7 UB
MW9	10/6/10	N	1.3 U	0.1 U		2 U		8 U		109 J	8540		16.7 U		20 U	1.0 U	0.1 U	0.4 U	0.4 U	1 U		27	3.3 J		88.1	3.35	14 J		7.6
MW9	10/19/11	N	0.50 U	0.098 U		2.0 U		3.5 J+		50 U	8400 B		2.9 J		10 U	0.20 U	0.50 U	1.0 U	1.0 U	2.0 U		69	1.0 U		82.00	3.1	8.9		1.0 U
MW9	10/16/12	N	0.50 U	0.39		0.91 J		10 U		50 U	8400 =		10 U		20 U	0.20 U	0.50 U	1.0 U	1.0 U	2.0 U		63	2.8 J		82	5.9 J	10 J		3.8
MW9	10/9/13	N	0.50 U	0.41 J		2.0 UJ		10.0 UJ		50 UJ	6200 J		10 UJ		20 UJ	0.21 U	0.50 U	1.0 U	1.0 U	2.0 U*		47 J	1.2			3.8 J	12		1.6 J
MW9	10/9/13	N2																											
MW9	9/24/14	N	0.070 U	1.6	0.18 U		0.75 U		16 U			1.1 U		7.3 U		0.061 U	0.24 U	0.23 U	0.22 U	0.43 U		14	1.1	41		2.4	10	2.5	
MW9	10/13/15	N	0.080 U	0.49 U		1.3 J		21.1 J			1.1 U		7.3 U		0.17	0.066 U	0.35 U	0.23 U	0.25 U	0.52 U		31.0 B	0.70 J	40.2		1.5 H	7.4	4.4	
MW9	4/13/16	N	0.080 U	0.49 U		1.4 J		33.6 J			1.5 J		7.3 U		0.28	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		26.6	0.99 J		37.2	1.4	7.3		30.2
MW10	10/15/97	N	13.5	8200 J		1.4		9.1		2190			2510 J		4.4		0.2	2	3	17		340	35			4.9	13		20
MW10	10/15/97	N2		8200 E		2 J		2.8 U							9.2		0.2	2	3	17									
MW10	4/6/00	N		9530 J												60 =													
MW10	4/6/00	N2		12900 =												5410 U													
MW10	4/26/01	N	2.9	22800		3.1		98		25200			2560		44	5.2 U	0.4	3.3	5.3	27		472	48		505	0.18	22		26
MW10	4/26/01	N2	2.9			2.4		5.9		5650			2380		25 U														
MW10	9/12/01	N	10 U	21000		3.9		3.9 J		2400			3200		9.5 J	130	0.44 U	6.3	10	55		540 J	61		630	0.13 J	23		64
MW10	9/12/01	N2				4.5		40		20000			3300		13														
MW10	8/7/02	N	11	22000 J		9.5		48.2		24400			2730		2.8 J	120	1 U	7	11	54		400	56		480	0.15 U	20		110
MW10	8/7/02	N2				7.3		10.1 J		10700			2540		6.1 J														
MW10	10/1/03	N	0.62	9000		2 J		30		5470			1960		10 J	18	0.25 U	2.5 U	2.5 U	13.5		287	22		93.58	0.05 U	3 J		25.3
MW10	10/1/03	N2	0.62			2 J		8		2590			1850		10 U														
MW10	9/23/04	N	10.0 U	38000 =		2.66		28.3		3550			2550		5.58 J	173 E	0.296 J	5.58 J	8.09 J	47.1		390	38		1640	0.0018 J	18 =		54.1
MW10	9/23/04	N2				3.01		12.4 J		24.1 J			1810		4.23 J	160													
MW10	9/27/06	N	2.0 UJ	23000 J		1.0 U		4.3 J		120			2600		20 U	50	0.50 U	2.0 J	1.7 J	16		450 J	14		440	0.10 U	24 =		21
MW10	9/21/07	N	2.4 J	1700 J		0.88 J		2.3 J		550			2700		20 UJ	12 J	1.0 U	1.3	1.0 U	7.2		380 J	20		420 J	0.68	25 J		12 J
MW10	10/23/08	FD	7 J	1720		2 UJ		10 UJ		1080	48600 J		2190 J		20 UJ	0.82 J	0.5 U	2.0 U	2.0 U	5.0 U		310 J	12.4		500 J	0.05 J	29.5		13.1
MW10	10/23/08	N	6 J	1630		2 UJ		10 UJ		1110 J	40000 J		2210 J		20 UJ	0.92 J	0.5 U	2.0 U	2.0 U	5.0 U		305 J	12.4		432 J	0.05 U	28.1		39.2
MW10	10/7/09	FD	23 J	214 J		2 UJ		10 UJ		704 J	36900 J		2310 J		20 UJ	0.996 UJ	0.1 UJ	0.094 J	0.083 J	0.49 J		282 J	9.84 J		347.47 J	0.05 UJ	59 J		2.13 J
MW10	10/7/09	N	17 J	220 J		2 UJ		8.2 J		1210 J	38800 J		2230 J		20 UJ	0.998 UJ	0.1 UJ	0.072 J	0.073 J	0.41 J		280 J	9.82 J		369.28 J	0.05 UJ	58.7 J		4.68 J
MW10	10/7/10	FD	2.3	77.1 J		2 U		8 U		396	37200		1820		20 U	1.0 UJ	0.1 U	0.4 U	0.074 J	1 U		272	7.3 J		346	0.10 UJ	47.7 J		1.8
MW10	10/7/10	N	1.8	92.4 J		2 U		8 U		488	41600		1780		20 U	1.0 UJ	0.1 U	0.4 U	0.051 J	1 U		308	7.2 J		390	0.10 UJ	48.2 J		2.2
MW10	10/20/11	FD	11 J	21		0.60 J		2 U		180	33000 B		1700		20 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		260	8.7		303.00	0.22	54		2.1
MW10	10/20/11	N	8.8 J	21		2.0 U		2 U		180	33000 B		1700		20 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		260	8.4		303.00	0.21	53		2.1
MW10	10/17/12	FD	12	14		0.50 J		10 U		180	31000 =		1600		20 U	0.20 U	0.50 U	1.0 U	1.0 U	2.0 U		230	8.0		292	0.067 J	69 J		1.7
MW10	10/17/12	N	12	8.7		0.55 J		10 U		190	32000 =		1600		20 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		240	7.8		304	0.075 J	68 J		1.7
MW10	10/10/13	FD	140 J	16		0.19 J		10.0 UJ		230 J	31000 J		1600 J		20 UJ	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		230 B	7.9			0.39 J	94		1.7

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane ug/L	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CaCO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
MW10	10/10/13	N	27 J	17		0.19 J		10.0 UJ		260 J	32000 J		1700 J		20 UJ	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		220 B	7.8			0.41 J	93		1.4
MW10	9/25/14	N	8.1	37	0.21 J		0.75 U		250 B			1300		7.3 U		0.061 U*	0.24 U	0.23 U	0.22 U	0.43 U		180	6.1	270		0.10	77	0.50 U	
MW10	10/15/15	N	8.2	0.49 U		1.0 J		188			861		7.3 U		150	0.061 U	0.35 U	0.23 U	0.25 U	0.52 U		178 B	6.5	244		ND	71.8	1.8	
MW10	4/7/16	N	290	0.49 U		0.75 U		1350			719		7.3 U		1900 *	4.8	0.35 U	0.46 J	0.53 J	2.9		162 B	9.8		189	0.035 UH	46.1		8.6 B
MW10	7/25/16	N	8.6	0.49 U		3.7 B		826 B			744		7.3 U		1700 B	5.2	0.35 U	0.66 J	0.64 J	5.2		160	12.3	188		0.035 U	31.7	11.6	
MW10	10/13/16	N	5.5 B	0.46 J		1.7 JB		434 B			777		6.2 U		7300	5.4 H	0.28 U	0.79 J	0.79 J	5.7		156	14.6	186		0.035 UH	24.3	11.1 ^	
MW10S	10/15/97	N	10 U	30000 E		2 U		28.5 J		45.4 J			10700 J		11.6		0.4	0.9 J	1	8		260	38			0.1 U	23		49.7
MW10S	10/15/97	N2		30000 J		2 J		10.9 J							8.4		0.4	0.9 J	1	8									
MW10S	4/7/00	N		56100 J																									
MW10S	4/7/00	N2		34800 =																									
MW10S	12/5/00	N	0.57	3810 B		0.74 J		13 J		610			6900		25 U	152	0.1 U	5.9	2.9	70		31	15		570	1	11		300
MW10S	12/5/00	N2	0.57	3810 J		9.36		160		11000			7100		35	152								570					
MW10S	4/25/01	N	0.55	49000		18		409		131000			7990		216	306	1 U	3.5	10 U	44		142	11		425	1.49 =	8.64		503
MW10S	4/25/01	N2	0.55			2.3		46		11300			6030		45		10 U	100 U	100 U	100 U						1.49			
MW10S	9/12/01	N	10 U	82000		5.1		170		35000			8600		100	75	0.44 U	0.94 J	0.41 J	15		270 J	10		260	4.7	13		19
MW10S	9/12/01	N2				0.29 U		3.2 J		48 J			7600		3.7 U														
MW10S	8/7/02	N	10.0 U	390 J		3.9		53.3		9490			7560		22.4 J	5 U	1 U	1 J	5 U	10		170	10		4 U	0.11 J	14		10
MW10S	8/7/02	N2				3.1		2.3 J		67.3			7070		0.98 U														
MW10S	9/25/03	N	0.5 U	2200		1 U		7		1760			5910		10 U	1 U	0.25 U	2.5 U	2.5 U	3.4 J		135	6.7		52.05	3.41	2 J		6.6
MW10S	9/25/03	N2	0.5 U			1 U		1 J		50 U			5900		10 U														
MW10S	9/22/04	N	10.0 UJ	9490		1.49 J		73.1 J		14500 J			5460 J		49.7 J	51.9	5.00 U	50.0 U	50.0 U	5.42 J		120 J	24 J		1220 J	3.6 J	15 R		7.54 R
MW10S	9/22/04	N2				0.190 J		1.79 J		22.7 J			3740 J		6.07 J														
MW10S	9/29/05	N	2.0 U	0.11 U		1.0 UJ		14 J		3600 J			4000 J		8.0 J	5.6	0.50 U	5.0 U	5.0 U	0.99 J		130 J	16 J		300 J	2.0 J	120 R		3.0 J
MW10S	9/29/05	N2				1.0 UJ		10 UJ		50 UJ			3900 J		20 UJ														
MW10S	9/26/06	N	2.0 UJ	2700 J		1.0 U		2.2 J		50 U			2500		20 U	1.2	0.50 U	5.0 U	5.0 U	2.6 J		180 J	8.6		310	1.2	79 =		6.5
MW10S	9/21/07	N	2.0 U	24 J		1.0 UJ		10 UJ		100 UJ			1300		20 UJ	2.4 R	1.0 U	1.0 U	1.0 U	2.0 U		170 J	8.7		240 J	1.3	69 J		2.9 J
MW10S	10/24/08	N	2.0 UJ													3.36	0.5 U	2.0 U	2.0 U	5.0 U									
MW10S	4/18/16	N	0.080 U	0.59 J		2.6		190 B			388		7.3 U		3500	4.7	0.35 U	0.25 U	0.23 U	2.7		102	7.8		92.1	0.035 UH	9.1		9.5
MW10S	7/25/16	N	0.080 U	0.68 J		9.2 B		183 B			315		7.3 U		5200 B	13	0.35 U	0.39 J	0.23 U	5.6		107	7.7	124		0.035 U	11.8	15.6	
MW10S	10/13/16	N	0.12 JB	0.44 J		4.6 B		124 B			399		6.2 U		6600	8.4 H	0.28 U	0.30 J	0.23 U	4.6		83.7	6.1	100		0.035 UH	11.9	12.3 ^	
MW11	10/15/97	N	10 U	1 U		2 U		2 U		10 U			2 U		5.3		0.3	1 JB	0.2 J	0.5 J		190	7.5			5	12		1.3
MW11	10/15/97	N2		1 U		2 J		4.2 U							10.3		0.3	1 J	0.2 J	0.5 J									
MW11	4/4/00	N		0.6 U																									
MW11	4/24/01	N	0.1 U	0.1 U		1.4		25 U		58			15 U		25	5.3 U	0.1 U	1 U	1 U	1 U		185	6.16		231	3.59 =	4.57		7.9
MW11	4/24/01	N2	0.11 U	0.11 U		1.2		25 U		25 U			15 U		20	5.3 U	0.1 U	1 U	1 U	1 U		225	6.25		231	3.59	3.48		4.67
MW11	4/24/01	N3	0.11 U			1.4		25 U		151			15 U		126	5.4 U											3.74 =		
MW11	4/24/01	N4				1.3		25 U		25 U			15 U		25 U	5.4 U											3.74		
MW11	9/10/01	N	10 U	0.091 J		1.4		2.9 J		66 J			1.9		9.1 J	0.24 U	0.44 U	0.5 U	0.4 U	1.2 U		190	8		220	3.1	7.4 U		4.2
MW11	9/10/01	N2				1.1		2.2 U		35 U			0.45 J		3.7 U														
MW11	8/6/02	N	10.0 U	0.04 U		4.7		0.83 J		46			2.3 J		6.4 J	5 U	1 U	5 U	5 U	5 U		210	7.8		230	0.15 U	7.6		18
MW11	8/6/02	N2	10.0 U			1.5 J		0.3 U		11.2 U			1.2 J		8.5 J														
MW11	9/23/03	N	0.5 U	0.11 U		1 U		2		160			5 U		10 U	0.98 U	0.25 U	2.5 U	2.5 U	2.5 U		187	6.7		72.14	2.94	2 U		2.3
MW11	9/23/03	N2	0.5 U			1 U		1 U		50 U			5 U		10 U														
MW11	9/21/04	N	10.0 U	0.0656 J		0.885 J		0.620 J		15.6 J			2.81 J		6.36 J	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U		210	9.0 =		1020	3.0 J	6.2 J		14.1
MW11	9/21/04	N2				0.948 J		0.366 J		6.05 J			1.40 J		4.05 J														

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane ug/L	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CaCO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
MW11	9/29/05	N	2.0 U	740 =		1.0 UJ		10 UJ		50 UJ			1.6 J		20 UJ	0.95 U	0.50 U	5.0 U	5.0 U	5.0 U		200 J	14 J		280 J	2.4 J	9.7 R		1.2 J
MW11	9/29/05	N2				1.0 UJ		10 UJ		50 UJ			3.0 J		20 UJ														
MW11	9/27/06	N	2.0 UJ	0.11 U		1.0 UJ		10 UJ		50 UJ			10 UJ		20 UJ	0.93 U	0.50 U	5.0 U	5.0 U	5.0 U		220 J	16 J		240	0.53 J	8.8 J		2.3
MW11	9/20/07	N	2.0 UJ	0.093 U		1.2 J		10 UJ		100 UJ			10 UJ		20 UJ	0.93 U	1.0 U	1.0 U	1.0 U	2.0 U		220	20		260 J	2.4	19 J		1.2 J
MW11	10/22/08	N	2.0 UJ	0.27		2 UJ		10 UJ		533	33600 J		10 UJ		20 UJ	1 U	0.5 U	2.0 U	2.0 U	5 U		234 J	19.9		433 J	2.26 J	17.8		20.2
MW11	4/11/16	N	0.080 U	0.75 J		0.75 U		32.1 JB			1.9 JB		7.3 U		0.016 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		229 B	18.0		470	1.6 H	200		0.32 J
MW12	10/15/97	N	10 U	13000 E		2 U		5		267			1660		10.6		1	2	3	14		490	50			0.1 U	15		21.7
MW12	10/15/97	N2		13000 J		2 U		6.1 U							16.3		1	2	3	14									
MW12	4/6/00	FD		10600 J												45 =													
MW12	4/6/00	FD2		14100 =												5150 U													
MW12	4/6/00	N		15000 =												5210 U													
MW12	4/6/00	N2		10300 J												47 =													
MW12	4/26/01	N	0.99	1500		1		25 U		151			1540		25 U	44	0.34	2.5	4.1	22		564	48		556	0.43	16		23
MW12	4/26/01	N2	0.99			0.91		25 U		131			1570		25 U														
MW12	9/13/01	N	10 U	18000		1.1		5 J		770			1300		9.3 J	40	0.44 U	2.3 U	3.2 U	20		490	47		470	0.53 U	16		25
MW12	9/13/01	N2				0.95 U		6.8 J		740			1400		12														
MW12	5/14/02	FD		4000																									
MW12	5/14/02	N	10 U	4000		1.4 U		5.3 J		44.5			1670		7.4 J	33	1 U	2 J	2 J	14		490	39		520	0.68 H	16		31
MW12	5/14/02	N2		4300		1.5 J		5 J		11.2 U			1670		9.3 J										520				
MW12	5/14/02	N3				1.4 U		4.9 J		11.2 U			1680		12 J														
MW12	8/8/02	N	10.0 U	6400 J		2.8		5.6 J		123			1620		7.7 J	28	1 U	2 J	2 J	15		460	37		4 U	0.46	15		28
MW12	8/8/02	N2				1.4 U		2.9 J		105			1600		3.3 J														
MW12	4/29/03	N	0.5 U	3000		1 J		5		230			1640		10 U	17	0.5 U	1.3 J	1.3 J	11		470	31		442	0.8	20		19
MW12	4/29/03	N2	0.5 U			1 U		4		25 U			1560		10 U														
MW12	9/23/03	N	0.49 J	10000		1 U		4		70 J			1420		10 U	14	0.25 U	2.5 U	2.5 U	8.6		443	30.8		151.4	1.17	2 U		15.5
MW12	9/23/03	N2	0.49 J			1 U		3		50 U			1530		10 U		0.25 U	2.5 U	2.5 U	9.4		433	29.8		153.3	1.23	2 U		16
MW12	9/23/03	N3	0.64			1 U		4		80 J			1490		10 U														
MW12	9/23/03	N4				1 U		3		50 U			1490		10 U														
MW12	5/4/04	N	1.34 J	11200 J		0.564 J		5.50 R		52.7 R	45900		1730 R		10.8 R	22.9	0.124 J	1.39 J	1.03 J	11.2		446	29 =		443	1.1 J	14 R		20.2 J
MW12	5/4/04	N2				0.600 J		3.95 R		33.6 R			1480 R		8.80 R														
MW12	9/22/04	N	10.0 UJ	9060 J		1.00 UJ		5.09 J		53.9 J			1540 J		9.53 J	28.2 J	0.113 J	1.22 J	0.866 J	9.83		440 J	26 J		1660 J	1.1 J	12 R		18.2 R
MW12	9/22/04	N2		3730 E		0.672 J		3.91 J		22.7 J			1230 J		8.10 J														
MW12	5/10/05	N	2.0 U	8300 J		1.0 U		4.2 J		50 U			1500		8.9 J	6.1	0.50 U	0.93 J	5.0 U	5.6		390 J	23 J		360 J	1.3 J	16 R		9.9 R
MW12	5/10/05	N2				1.0 U		4.8 J		50 U			1400		20 U														
MW12	9/27/05	N	2.0 UJ	8500 J		1.0 UJ		10 U		50 U			1200		7.8 J	3.3	0.50 U	0.85 J	5.0 U	4.9 J		370 J	20 J		410	1.1 J	26 J		9.2
MW12	9/27/05	N2				1.0 UJ		3.9 J		50 U			1300		20 U														
MW12	6/7/06	N	2.0 U	6100 J		1.0 UJ		2.3 J		50 R			1100 J		20 UJ	0.94 U	0.50 U	0.67 J	5.0 U	3.4 J		400 J	21 J		400 J	2.1 J	32 =		7.2 J
MW12	9/26/06	FD	2.0 UJ	2000 =		1.0 UJ		2.5 UJ		46 J			1200 J		20 UJ	1.4	0.50 U	5.0 U	5.0 U	1.7 J		390 J	15 J		370	2.0 J	15 J		10
MW12	9/26/06	N	2.0 UJ	3100 =		1.0 UJ		3.2 J		50 UJ			1200 J		16 J	1.5	0.50 U	5.0 U	5.0 U	2.9 J		390 J	14 J		380	1.9 J	15 J		10
MW12	5/9/07	N	2.0 UJ	3000 J		1.0 UJ		2.1 J		100 UJ			1100		5.2 J	0.99 J	1.0 UJ	1.0 UJ	1.0 UJ	1.9 J		340 =	13		370	2.4	37 J		7.0 UB
MW12	9/19/07	FD	2.0 UJ	1000 J		1.1 J		1.7 J		100 R			790		20 UJ	0.74 J	1.0 U	1.0 U	1.0 U	2.0 U		340	14		350 J	2.2	2.7 J		5.7 J
MW12	9/19/07	N	2.0 UJ	1100 J		0.97 J		10 UJ		100 R			820		20 UJ	0.71 J	1.0 U	1.0 U	1.0 U	2.0 U		340	14		330 J	2.8	29 J		5.6 J
MW12	5/20/08	FD	2.0 UJ	2200 J		0.61 J		3.8		100 UJ			1000		4.2 J	0.95 U	1.0 UJ	1.0 U	1.0 U	1.6 J		360 =	12		380	2.1	25		4.5 J
MW12	5/20/08	N	2.0 UJ	2100 J		0.59 J		3.7		100 UJ			1000		4.6 J	0.96 U	1.0 UJ	1.0 U	1.0 U	1.5 J		360 =	12		350	2.0	25		4.7 J
MW12	10/21/08	FD	2.0 UJ	1300.00 J		2.00 U		3.70 J		936	45000		1120		20 U	1.00 U	0.5 U	2.0 U	2.0 U	5.0 U		322	14.50		465 J	2.95 J	31.70		11.80 J

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane ug/L	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CaCO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
MW12	10/21/08	N	2.0 UJ	1670.00 J		2 U		4 J		927	50200		1140		11 J	1.00 U	0.5 U	2.0 U	2.0 U	5.0 U		323	13.10		519 J	2.96 J	31.80		11.70 J
MW12	6/2/09	FD	0.8 UJ	489 J		2 U		10 UJ		292 =	40600 =		1020 =		20 U	1.0 UJ	0.5 U	0.31 J	2.0 U	0.96 J	302 J		12.4		429.3758	2.64 J	62.2		1.7 J
MW12	6/2/09	N	0.8 UJ	521 J		2 U		10 UJ		310 =	34400 =		1040 =		20 U	1.0 UJ	0.5 U	0.28 J	2.0 U	0.88 J	294 J		12.3		363.3928	2.65 J	59.9		3.6 J
MW12	10/6/09	FD	0.83 UJ	289 J		2 UJ		4 J		294 J	47600 J		982 J		20 UJ	0.997 UJ	0.1 UJ	0.069 J	0.4 UJ	0.28 J		294 J	13.7 J		468.19 J	1.83 J	84.7 J		3.25 J
MW12	10/6/09	N	0.83 UJ	295 J		2 UJ		4 J		307 J	51600 J		987 J		20 UJ	0.995 UJ	0.1 UJ	0.073 J	0.4 UJ	0.28 J		297 J	13.7 J		509.63 J	1.84 J	85.4 J		3.83 J
MW12	5/19/10	FD	1.3 U	81.9		2 UJ		3.8 J		225. J	41800. J		633. J		8.2 J	1.0 U	0.5 U	5 U	5 U	5 U		308	14.7		432	1.91 J	117		36.1 UB
MW12	5/19/10	N	1.3 U	70.3		1.9 J		3.5 J		228. J	47700. J		913. J		11. J	1.0 U	0.5 U	5 U	5 U	5 U		308	14.7		496	1.87 J	116		41.8 UB
MW12	10/5/10	FD	1.3 U	42.9		2 U		8 U		332	47500 R		859		20 U	1.0 U	0.1 U	0.4 U	0.4 U	1 U		316	14.4 J		483	1.72	119		22.9 J
MW12	10/5/10	N	1.3 U	43.7		2 U		8 U		358	41500 R		834		20 U	1.0 U	0.1 U	0.4 U	0.044	1 U		320	14.4 J		548	1.73	119		53.9 J
MW12	6/29/11	FD	0.9 U	35.1		2 UJ		10 U		291	56900		765		20 U	0.998 U	0.1 U	0.4 U	0.4 U	1 U		276	13.3 J		524.00	2.11 J	103 J		1.53 J+
MW12	6/29/11	N	0.9 U	37		1.8 J		10 U		314	62600		744		20 U	0.998 U	0.1 U	0.4 U	0.4 U	1 U		295	14.1 J		555.00	2.28	111		1.28 J+
MW12	10/18/11	FD	0.50 U	30		1.0 J		2.3 J+		50 U	42000 B		640		10 U	0.20 U	0.50 U	1.0 U	1.0 U	2.0 U		300	14		398.00	2.1	100		2.0
MW12	10/18/11	N	0.50 U	37		1.1 J		2.3 J+		50 U	42000 B		660		10 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		300	14		398.00	2.1	98		2.0
MW12	5/22/12	FD	0.50 U	16 J		2.0 U		4.3 J		50 U	43000 =		630		20 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		310	14 =		419.00	1.8	120		1.6
MW12	5/22/12	N	0.50 U	21 J		2.0 U		10 U		50 U	44000 =		670		20 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		300	14 =		431.00	1.8	120		1.5
MW12	10/16/12	FD	0.50 U	23		1.2 J		10 U		50 U	43000 =		420		20 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		290	13		424	2.0 J	130 =		1.3
MW12	10/16/12	N	0.50 U	26		0.98 J		10 U		50 U	42000 =		410		20 U	0.21 U	0.50 U	1.0 U	1.0 U	2.0 U		280	14		413	2.0 J	120 =		1.4
MW12	5/22/13	FD	0.50 U	24		2.0 U		10 U		50 UJ	39000 B		530 B		20 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		290	12			2.1 J	150		1.6
MW12	5/22/13	N	0.50 U	22		2.0 U		10 U		50 U	36000 B		460 B		20 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		280	12			2.0 J	150		1.6
MW12	10/8/13	FD	0.50 U	22		0.37 J		10.0 U		50 U	42000 B		710 B		20 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		260	12			2.1 J	120		1.3
MW12	10/8/13	N	0.50 U	28		0.37 J		10.0 U		50 U	41000 B		680 B		20 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		270	12			2.1 J	120		1.4
MW12	5/14/14	N		19																									
MW12	9/23/14	N	0.076 J	24	0.66 JB		0.75 U		16 U			450		7.3 U		0.061 U	0.24 U	0.23 U	0.22 U	0.43 U		240	11	360		1.7	130	0.50 U	
MW12	4/20/15	N	0.070 U	16	1.1 JB		1.4 J		16 U			530		7.3 U		0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		220 B	11		410	1.7	140		0.95 J
MW12	10/13/15	N	0.080 JB	0.49 U		0.75 U		362 B			27.4		7.3 U		25	0.061 U	0.35 U	0.23 U	0.25 U	0.52 U		279 B	11.7	74.4		1.6	159	1.2	
MW12	4/6/16	N	0.12 J	0.77 J		1.4 JB^		60.1 JB			148 B		7.3 U		5.2	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		236 B	10.6		358 F2	1.6	135		0.67 J
MW12	7/19/16	N	0.080 U	0.61 J		1.6 JB		16.0 U			388		7.3 U		14	0.061 U	0.35 U	0.25 U	0.23 U	0.52 U		238	10.1	358		1.4	134	0.96 J	
MW12	10/12/16	N	0.092 J	0.50 J		1.6 JB		10 JB			439 B		6.2 U		14	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U		239	10.8	340		1.2 H	124	0.71 J	
MW13	10/8/97	N	10 U	0.7 J		2 U		3.32 U		6.7 J			27.3		2.7		0.1 U	1 U	1 U	1 U		70	2.7			1.4	1.4		17.9
MW13	10/8/97	N2		0.7 J													0.1 U	1 U	1 U	1 U									
MW13	4/5/00	N		0.8 =													10 U												
MW13	12/5/00	N	0.58 U	114 J		1 U		25 U		230			66		25 U	5.5 U	0.1 U	1 U	1 U	1 U		72	4.2		140	0.45	8.2		7.9
MW13	12/5/00	N2	0.58 U					92		26000			870		52	5.5 U	0.1 U	1 U	1 U	1 U					140				
MW13	4/23/01	N	0.12 U	0.18		14		140		56300			1300		89	5.3 U	0.1 U	1 U	1 U	1 U		70	3.52		146	1.77	35		18
MW13	4/23/01	N2	0.12 U			0.24		25 U		25 U			110		25 U														
MW13	6/19/01	N	0.12 U	0.11 U		1.1		68		32800			848		45	5.3 U	0.12	1 U	1 U	1 U		68	5.73		112	2.87 =	11		13
MW13	6/19/01	N2	0.12 U			9.1		6.1 J		141			26		25 U											2.87			
MW13	9/10/01	N	10 U	0.69		3.9		49		14000			510		37	0.24 U	0.44 U	0.5 U	0.4 U	1.2 U		75	5.4		100	2.5	7.5 U		9.5
MW13	9/10/01	N2				0.54 J		2.8 J		52 J			27		4.7 J														
MW13	8/5/02	N	10.0 U	0.64		9.1		55.3		19000			580		39.5	5 U	1 U	5 U	5 U	5 U		86	6.8		110	0.15 U	8.4		6.3
MW13	8/5/02	N2				2.2 J		2.5 J		1300			45		9.1 J														
MW13	9/23/03	N	0.5 U	2.9		3		55		24600			687		50	1 U	0.25 U	2.5 U	2.5 U	2.5 U		78	5.1		35.04	1.86	7		6
MW13	9/23/03	N2	0.5 U			1 U		8		960			182		10 U														
MW13	9/21/04	N	10.0 UJ	4.67		1.52		32.4		8770			357		24.3 J	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U		68 J	6.5 J		667 J	2.4 J	6.4 R		6.30 R
MW13	9/21/04	N2				0.259 J		1.96 J		125 UJ			3.67 J		5.28 J														

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane ug/L	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CaCO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
MW13	9/27/05	N	2.0 UJ	0.85		1.0 J		18		6200			200		18 J	0.97 U	0.50 U	5.0 U	5.0 U	5.0 U		67 J	3.1 J		68	0.60 J	19 J		4.3
MW13	9/27/05	N2				1.0 UJ		2.5 J		50 U			7.1 J		20 U														
MW13	9/18/07	N	2.0 UJ	0.53 J		1.0 UJ		10 UJ		100 UJ			6.3 J		5.2 J	0.93 R	1.0 U	1.0 U	1.0 U	2.0 U		71 J	2.9		100 J	0.31 J	29 J		4.1 J
MW13	10/21/08	N	2.0 UJ	0.31 UJ		2 U		10 UJ		207	10500 J		10 U		20 U	1.00 U	0.50 U	2.0 U	2.0 U	5.0 U		55	1.90		110 J	0.45 J	10.10		3.44 J
MW13	10/7/09	N	0.83 UJ	0.16 J		2 UJ		3.2 J		50 UJ	4430 J		10 UJ		20 UJ	0.996 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ		30 J	2.12 J		45.46 J	0.77 J	9.71 J		13.9 J
MW13	4/13/16	N	0.080 U	0.49 U		3.2		449			13.4		7.3 U		0.34	0.065 U	0.35 U	0.25 U	0.23 U	0.52 U		51.0	1.4		54.9	0.70	3.4		4.2
MW13	7/20/16	N	0.080 U	0.49 U		1.5 J		19.4 J			1.1 U		7.3 U		1.1	0.063 U	0.35 U	0.25 U	0.23 U	0.52 U		39.5 B	0.91 J	86		1	2.2	2.1	
MW13	10/10/16	N	0.080 U	0.87 J		2.3 B		23.2 JB			0.94 JB		6.2 U		0.37	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U		49.3	0.98 J	56		0.58 H F1	3.1 F1	1.9 B	
MW14	10/9/97	N	10 U	1 U		2 U		1 U		20 U			4 J		4	0.1 U	1 U	1 U	1 U	1 U		120	8			1.6	2.4		1 U
MW14	10/9/97	N2		1 U		2 U		2 U							2 U		0.1 U	1 U	1 U	1 U									
MW14	4/6/00	N		0.5 U												11 U													
MW14	6/19/01	N	0.11 U	0.96		1.4		5.4 J		1070			57		25 U	239	0.1 U	1 U	1 U	1 U		104	12		124	2.06	3.48 J		6.41
MW14	6/19/01	N2	0.11 U			2		25 U		25 U			4.4		25 U											2.06 =			
MW15	10/16/97	N	10 U	1 U		2 U		2 U		8.2 J			62.2		2 U		0.1 U	1 U	1 U	1 U		190	6.5			4.1	6.3		1.2
MW15	10/16/97	N2		1 U		2 U		3.5 U							13.9		0.1 U	1 U	1 U	1 U									
MW15	4/4/00	N		0.5 U												11 U													
MW15	4/25/01	N	0.1 U	0.11 U		0.5		25 U		58			4.8		50	5.3 U	0.1 U	1 U	1 U	1 U		240	15		276	3.97	2.61		5.24
MW15	4/25/01	N2	0.1 U	0.11 U		0.31		25 U		25 U			15 U		15	5.6 U	0.1 U	1 U	1 U	1 U		246	16		276	3.97 =	4.05		3.7
MW15	4/25/01	N3	0.12 U			0.56		25 U		174			4.1		25 U	5.6 U										3.92			
MW15	4/25/01	N4				0.42		25 U		25 U			15 U		16											3.92 =			
MW15	9/12/01	N	10 U	0.077 J		0.95 U		2.9 J		35 U			0.31 J		35	0.24 U	0.44 U	0.5 U	0.4 U	1.2 U		240	17		270	3.7	4.5 U		4.5
MW15	9/12/01	N2				0.95 U		5.7 J		63 J			2.7		36														
MW15	8/6/02	N	10.0 U	0.04 U		3.7		1.6 J		130			2.8 J		17 J	5 U	1 U	5 U	5 U	5 U		230	16		250	0.15 U	4.7		53
MW15	8/6/02	N2				2.6		0.3 U		11 U			0.42 U		11 J														
MW15	9/23/03	N	0.5 U	0.1 U		1 U		1 J		280			9 J		10 J	0.99 U	0.25 U	2.5 U	2.5 U	2.5 U		213	17.4		88.57	3.8	2 U		1.8
MW15	9/23/03	N2	0.5 U			1 U		1 U		50 U			5 U		10 U														
MW15	9/21/04	N	10.0 U	0.279		0.468 J		1.74 J		36.7			3.15 J		20.8 J	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U		230	16 =		1020	3.2 J	3.9 J		12.7
MW15	9/21/04	N2				0.482 J		0.648 J		5.57 J			0.976 J		8.97 J														
MW15	9/29/05	N	2.0 U	0.11 U		1.0 UJ		2.4 J		420 J			15 J		20 UJ	0.93 U	0.50 U	5.0 U	5.0 U	5.0 U		220 J	17 J		300 J	4.2 J	5.8 R		0.84 J
MW15	9/29/05	N2				1.0 UJ		10 UJ		50 UJ			1.6 J		20 UJ														
MW15	9/27/06	N	2.0 UJ	0.11 U		1.0 UJ		3.5 J		50 UJ			2.0 UB		13 J	0.91 U	0.50 U	5.0 U	5.0 U	5.0 U		260 J	14 J		250	4.7 J	5.9 J		2.1
MW15	9/19/07	N	2.0 UJ	0.10 U		0.68 J		10 UJ		100 UJ			10 UJ		20 UJ	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U		250	15		250 J	5.7	13 J		1.3 J
MW15	5/20/08	N	2.0 UJ	0.18 J		0.40 J		1.0 J		100 UJ			0.52 J		20 U	0.93 U	1.0 UJ	1.0 U	1.0 U	2.0 UJ		260 =	14		290	4.7	6.6		0.85 J
MW15	10/21/08	N	2.0 UJ	0.10 UJ		2 U		10 UJ		854	45400		10 U		20 U	1.00 U	0.5 U	2.0 U	2.0 U	5.00 U		265	14.60		567 J	6.05 J	6.99		13.60 J
MW15	6/2/09	N	0.8 UJ	0.1 UJ		2 U		10 UJ		301 =	30600 =		10 U		20 U	1.0 UJ	0.5 U	0.21 J	2.0 U	5.0 U	279 J		13.5		375.2114	5.33 J	6.42		1.7 UJ
MW15	10/7/09	N	0.83 UJ	0.1 UJ		2 UJ		3 J		293 J	25500 J		10 UJ		5.4 J	0.999 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ		260 J	12.9 J		294.28 J	4.74 J	6.52 J		1.49 J
MW15	5/18/10	N	1.3 U	0.1 U		2 UJ		10 UJ		194. J	24400. J		10 UJ		20 UJ	1.0 U	0.5 U	5 U	5 U	5 U		300	10.7		342	4.57 J	6.3		26.7 UB
MW15	10/7/10	N	1.3 U	2.32 J		2 U		8 U		311	38400		16.7 U		20 U	1.0 UJ	0.5 UJ	2 UJ	2 UJ	5 UJ		252	13.2 J		430	5.49 J	6.9 J		1.0 U
MW15	6/28/11	N	0.9 U	0.1 U		2 UJ		10 U		205	23100		10 U		20 U	0.998 U	0.1 U	0.4 U	0.4 U	1 U		239	12.1 J		307.00	5.2 J	6.91		0.77 J
MW15	10/18/11	N	0.50 U	0.10 U		0.70 J		2.7 J+		50 U	24000 B		1.7 J		10 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		240	12		261.00	4.8 J	5.3		1.0 J
MW15	5/22/12	N	0.50 U	0.024 J		2.0 U		10 U		50 U	24000 =		10 U		20 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		260	11		266.00	4.6 J	5.1 J		1.2
MW15	10/16/12	N	0.50 U	0.094 U		0.97 J		10 U		50 U	24000 =		10 U		20 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		250	12		271	5.3 J	5.0 U		0.69 J
MW15	5/21/13	N	0.50 U	0.025 J		2.0 U		10 U		50 U	26000 B		10 U		20 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		280	9.8			4.7 J	5.9		0.82 J
MW15	10/8/13	N	0.50 U	0.095 U		0.36 J		10.0 U		50 U	23000 B		10 U		20 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		220	11			5.2 J	6.5		0.50 J
MW15	5/13/14	N		0.095 U																									

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane ug/L	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CaCO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
MW15	9/23/14	N	0.070 U	0.054 J	1.1 JB		0.75 U		28 J			1.9 J		7.3 U		0.060 U	0.24 U	0.23 U	0.22 U	0.43 U		210	11	250		5.3	5.6	0.85 J	
MW15	4/20/15	N	0.070 U	0.015 U	0.78 JB		0.75 U		16 U			1.1 J		7.3 U		0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		190 B	11		270	5.6	5.7		0.44 J
MW15	10/12/15	N	0.080 U	0.54 J		1.0 J		16.0 U			1.1 U		7.3 U		0.015 U	0.063 U	0.35 U	0.23 U	0.25 U	0.52 U		224 B	12	302		6.7 F1	5.8	0.55	
MW15	4/5/16	N	0.080 U	0.70 J		1.7 JB		16.0 U			1.1 U		7.3 U		0.078 J	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		207 B	12.5		312	0.45	6.3		0.49 J
MW16	10/14/97	N	10 U	1 U		17.1		438		15.3 J			10300 J		210		0.1 U	1 U	1 U	1 U		170	6.1			2.6	8.1		3
MW16	10/14/97	N2		1 U		2 U		2.7 U							1.9 J		0.1 U	1 U	1 U	1 U									
MW16	4/6/00	N		0.5 U												10 U													
MW16	4/23/01	N	0.12 U	0.11 U		6.5		62		22300			1460		136	5.6 U	0.1 U	1 U	1 U	1 U		90	3.57		164	8.69 =	29		4.4
MW16	4/23/01	N2	0.12 U			1 U		25 U		26			9.4		23											8.69			
MW16	9/10/01	N	10 U	0.17		1.8		23 U		5500			520		19	0.24 U	0.44 U	0.5 U	0.4 U	1.2 U		79	1.8		120	5.8	11		0.34 U
MW16	9/10/01	N2				0.29 U		2.2 U		35 U			0.82 J		4.5 J														
MW16	8/6/02	N	10.0 U	0.035 J		3.5		25 J		6800			14		760 J	5 U	1 U	5 U	5 U	5 U		130	2		120	0.15 U	13		1.3
MW16	8/6/02	N2				1.4 U		0.3 U		78			9.1 J		13 J														
MW16	9/23/03	N	0.5 U	0.089 J		2 J		18		7470			532		10 J	1.1 U	0.25 U	2.5 U	2.5 U	2.5 U		82	6.2		37.96	3.49	3 J		2.3
MW16	9/23/03	N2	0.5 U			1 U		1 U		50 U			5 U		10 U														
MW16	9/21/04	N	10.0 U	0.0962 J		0.277 J		4.07 J		570			74.7		8.71 J	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U		82	3.7 =		1220	2.1 J	5.5 J		4.28
MW16	9/21/04	N2				0.135 J		0.509 J		25.0 U			0.617 J		2.79 J														
MW16	9/29/05	N	2.0 U	0.11 U		1.0 UJ		7.6 J		1000 J			130 J		8.1 J	1.0 U	0.50 U	5.0 U	5.0 U	5.0 U		82 J	11 J		190 J	1.5 J	71 R		0.83 J
MW16	9/29/05	N2				1.0 UJ		2.9 J		50 UJ			2.1 J		20 UJ														
MW16	9/27/06	N	2.0 UJ	0.046 J		1.0 UJ		10 UJ		50 UJ			0.59 UB		20 UJ	0.92 U	0.50 U	5.0 U	5.0 U	5.0 U		83 J	4.1 J		100	1.2 J	32 J		1.3
MW16	9/18/07	N	2.0 UJ	0.20 J		1.0 UJ		10 UJ		100 UJ			10 UJ		20 UJ	0.99 R	1.0 U	1.0 U	1.0 U	2.0 U		81 J	4.5		120 J	1.2 J	23 J		1.3 J
MW16	10/22/08	N	2.0 UJ	0.08 J		2 UJ		10 UJ		318 J	19400 J		20 J		20 UJ	1 U	0.5 U	2.0 U	2.0 U	5 U		51 J	7.51		175 J	0.99 J	43.2		92.3
MW16	10/6/09	N	0.83 UJ	0.1 UJ		2 UJ		6.6 J		458 J	8360 J		48.6 J		20 UJ	0.998 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ		40 J	6.35 J		81.869 J	1.03 J	36.7 J		1 UJ
MW16	10/5/10	N	1.3 U	0.1 U		2 U		8 U		50 U	2910 R		16.7 U		20 U	1.0 U	0.1 U	0.4 U	0.4 U	1 U		39	5.7 J		29.3	0.63 J	6.3 J		15.7
MW16	10/19/11	N	0.50 U	0.095 U		0.44 J		2.2 J+		130	3200 B		14		10 U	0.20 U	0.50 U	1.0 U	1.0 U	2.0 U		32	4.2		30.70	0.63 J	12		1.0 U
MW16	10/16/12	N	0.50 U	0.099 U		0.66 J		10 U		180	3600 =		17		20 U	0.20 U	0.50 U	1.0 U	1.0 U	2.0 U		37	4.6		39.8	0.52 J	17 J		1.3
MW16	10/8/13	N	0.50 U	0.029 J		0.61 J		10.0 U		1500 B	3300 B		100 B		59 J	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		34	6.2			0.57 J	6.3		1.1
MW16	9/23/14	N	0.070 U	0.036 J	0.41 JB		0.75 U		16 U			1.1 U		7.3 U		0.060 U	0.24 U	0.23 U	0.22 U	0.43 U		31	5.4	60		0.54	2.8	1.1	
MW16	10/13/15	N	0.080 U	0.49 U		1.0 J		45.2 JB			2.1 J		7.3 U		0.015 U	0.061 U	0.35 U	0.23 U	0.25 U	0.52 U		48.4 B	4.3	84.4		0.61	5.9	0.70 J	
MW16	4/6/16	N	0.080 U	0.49 U		1.9 J		168 B			14.6 B		7.3 U		0.015 U	0.11 J	0.35 U	0.25 U	0.23 U	0.52 U		32.6 B	2.2		31.8	0.41	2.6		2.3
MW16	7/19/16	N	0.080 U	0.49 U		2.2 B		114			11.5		7.3 U		0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		32.4	2.2	34		0.42	2.6	5.8	
MW16	10/12/16	N	0.080 U	0.40 J		1.7 JB		61.7 JB			5.3 B		6.2 U		0.18	0.061 U	0.28 U	0.26 U	0.23 U	0.24 U		33.1	2.4	24		0.30 H	2.2	0.58 J	
MW17	10/15/97	N	10 U	1 U		2 U		2		10 U			2 U		17.6		0.1 U	1 JB	1 U	0.6 J		180	4.8			4.1	10		0.7 J
MW17	10/15/97	N2		1 U		2 U		2.3 U							2.5		0.1 U	1 J	1 U	0.6 J									
MW17	10/28/97	N		5																									
MW17	4/6/00	N		0.5 U												11 U													
MW17	4/26/01	N	0.12 U	0.72		0.6		25 U		33			15 U		12	54	0.1 U	1 U	1 U	1 U		202	4.12		228	4.98	6.82		1.57
MW17	4/26/01	N2	0.12 U			0.69		25 U		25 U			15 U		25 U											4.98 =			
MW17	9/11/01	N	10 U	0.059 U		0.94		2.2 U		330			0.27 U		3.7 U	0.29 U	0.44 U	0.5 U	0.4 U	1.2 U		180	4.8		210	4.4	9.3 U		1 J
MW17	9/11/01	N2				1		2.2 U		310			0.27 U		3.7 U														
MW17	8/8/02	N	10.0 U	0.032 J		3		0.47 J		11 U			0.42 U		0.98 U	5 U	1 U	5 U	5 U	5 U		200	4.6		210	0.15 U	7.4		0.73
MW17	8/8/02	N2				1.9 J		0.3 U		11 U			0.42 U		15 J														
MW17	9/25/03	N	0.5 U	0.46		1 U		1 U		50 U			18		10 U	0.96 U	0.25 U	2.5 U	2.5 U	2.5 U		184	4.4		71.56	5.1	2 U		2.1
MW17	9/25/03	N2	0.5 U			1 U		1 U		50 U			5 U		10 U														
MW17	9/22/04	N	10.0 UJ	2.82		0.0787 J		0.774 J		11.5 UB			0.371 J		2.46 J	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U		190 J	4.1 J		1100 J	4.8 J	8.6 R		1.67 R

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane ug/L	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CaCO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l	
MW17	9/22/04	N2				0.782 J		0.847 J		13.9 J			45.0 J		2.09 J															
MW17	9/27/05	N	2.0 UJ	0.054 J		1.0 UJ		10 U		50 U			0.44 J		20 U	0.92 U	0.50 U	5.0 U	5.0 U	5.0 U		160 J	3.9 J		180	5.1 J	7.8 J		0.91 J	
MW17	9/27/05	N2				1.0 UJ		10 U		50 U			10 U		20 U															
MW17	9/26/06	N	2.0 UJ	0.11 U		1.0 UJ		10 UJ		50 UJ			10 UJ		7.5 J	0.91 U	0.50 U	5.0 U	5.0 U	5.0 U		170 J	2.9 J		170	5.5 J	6.5 J		1.1	
MW17	9/19/07	N	2.0 UJ	0.099 U		1.0 J		10 UJ		100 UJ			10 UJ		20 UJ	0.94 U	1.0 U	1.0 U	1.0 U	2.0 U		160	4.7		160 J	5.6	14 J		1.2 J	
MW17	10/22/08	N	2.0 UJ	0.1		2 UJ		10 UJ		374 J	29200 J		10 UJ		20 UJ	1 U	0.5 U	2.0 U	2.0 U	5 U		155 J	7.78		295 J	5.75 J	7.75		20.2	
MW17	10/6/09	N	0.83 UJ	0.1 UJ		2 UJ		10 UJ		160 J	26700 J		10 UJ		20 UJ	0.995 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ		60 J	6.54 J		295.228 J	1.65 J	6.86 J		1 UJ	
MW17	10/5/10	N	1.3 U	0.1 U		2 U		10 U		163	20500		10 U		20 U	1.0 U	0.1 U	0.4 U	0.4 U	1 U		160	11.6 J		225	5.18	9.7 J		1.6	
MW17	10/18/11	N	0.50 U	0.095 U		1.1 J		2 U		50 U	17000 B		10 U		20 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		140	16		180.00	3.9	24		0.89 J	
MW17	10/16/12	N	0.50 U	0.095 U		1.2 J		10 U		50 U	17000 =		10 U		20 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		150	16		187	4.7	23 J		0.59 J	
MW17	10/8/13	N	0.50 U	0.095 U		0.72 J		10.0 U		50 U	18000 B		10 U		20 U	0.20 U	0.50 U	1.0 U	1.0 U	2.0 U		140	16			4.5 J	36		0.40 J	
MW17	9/24/14	N	0.070 U	0.015 U	0.83 J		0.75 U		16 U			1.3 J		7.3 U		0.061 U	0.24 U	0.23 U	0.22 U	0.43 U		150	15	250		4.8	40	0.72 J		
MW17	10/13/15	N	0.080 U	1.1 J		0.75 U		16.0 U			1.1 U		7.3 U		0.015 U	0.061 U	0.35 U	0.23 U	0.25 U	0.52 U		184 J	14.8	265		4.2 H	45.3	0.59		
MW17	4/5/16	N	0.080 U	0.81 J		1.8 JB		16.0 U			1.1 U		7.3 U		0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		173 B	13.6		289	3.5	85.4		0.46 J	
MW17	7/19/16	N	0.080 U	0.84 J		1.4 JB		16.0 U			1.1 U		7.3 U		0.015 U	0.061 U	0.35 U	0.25 U	0.23 U	0.52 U		195	14.7	336		2.8	142	0.52 J		
MW17	10/11/16	N	0.080 U	0.80 J		0.76 JB		5.3 U			0.28 JB		6.2 U		0.015 U	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U		208	17.0	348		2.7	136	0.36 JB		
MW18	10/10/97	N	10 U	27000 J		8.2		43.5 J		32000 J			10600		2.6	0.1 U	2	16	19			260	49			0.1 U	11		154	
MW18	10/10/97	N2		27000 E		8.9		62.5							5.3	0.1 U	2	16	19											
MW18	6/19/01	N	0.13 U	27400		4.9		21 J		13700			6650		25 U	5 U	1.1	14	10 U	20		168	19		182	0.13 U	33 J		6.63	
MW18	6/19/01	N2	0.13 U			5		43		15200			6540		25 U															
MW19	10/16/97	N	10 U	19000 J		2 U		38 J		10 U			2690 J		46		0.2	1 U	1 U	0.2 J		180	47			3.8	19		32.8	
MW19	10/16/97	N2		19000 E		2 U		3.4 U							2 U		0.2	1 U	1 U	0.2 J										
MW19	4/7/00	N		11800 =												5260 U														
MW19	4/7/00	N2		11000 J												22 =														
MW19	4/26/01	N	0.5	25600		2.2		38		10000			1840		27	325 =	1 U	10 U	10 U	10		236	39		323	3.37 =	47		33	
MW19	4/26/01	N2	0.5			1 U		25 U		25 U			1790		25 U	325	10 U	100 U	100 U	100 U						3.37				
MW19	9/12/01	N	16	400000		0.29 U		6.4 J		71 J			1800		5.8 J	240	0.44 U	1.9 U	1.7 U	28		320 J	19		270	1.3	9.7 U		34	
MW19	9/12/01	N2				1.7 J		44		5600			2100		53 J															
MW19	5/13/02	N		14000		1.4 U		5.1 J		11.2 U			2070		9.4 J	190														
MW19	8/8/02	N	10.0 U	11000 J		7		30.2		719			3100		290	210	1 U	2 J	1 J	29		130	22		4 U	0.16	16		65	
MW19	8/8/02	N2				1.4 U		7.1 J		218			3110		5.7 J															
MW19	4/29/03	N	2.4	4900		2 J		24		2030			3670		10 U	1200	500 U	5000 U	5000 U	5000 U		118	19.6		162	3	27		53	
MW19	4/29/03	N2	2.4			1 U		5		25 U			3590		10 U															
MW19	9/25/03	N	5.7	15000		1 U		27		950			2210		10 U	3200	1 U	10 U	10 U	46.6		160	17.5 J		71.57	2 J	90 J		129 J	
MW19	9/25/03	N2	5.7			1 U		9		50 J			4470		10 U												2 J			
MW19	5/4/04	N	1.13 J	70000 J		0.284 J		22.2 R		892 R	17600		4040 R		11.6 R	201	2.50 U	2.13 J	1.98 J	30.0		144	25 =		176	0.71 J	16 R		43.7 J	
MW19	5/4/04	N2				0.169 J		5.77 R		31.4			3360 R		6.93 R															
MW19	9/22/04	N	10.0 UJ	111000		1.00 UJ		13.5 J		402 J			3160 J		16.7 J	260	0.500 U	3.45 J	2.25 J	50.3		110 J	15 J		1120 J	1.5 J	23 R		31.3 R	
MW19	9/22/04	N2				0.159 J		6.26 J		125 U			2650		16.0 J															
MW19	5/10/05	N	2.0 U	45000 J		1.0 U		6.3 J		50 U			2300		9.8 J	2300 =	100 UJ	1000 UJ	1000 UJ	1000 UJ		97 J	18 J		140 J	0.76 J	29 R		35 R	
MW19	5/10/05	N2				1.0 U		15		630			2100		8.4 J															
MW19	9/29/05	N	2.0 U	13000 =		1.0 UJ		11 J		97 J			2600 J		20 UJ	78	0.50 U	1.2 J	1.1 J	18		140 J	19 J		5 UJ	0.75 J	40 R		32 J	
MW19	9/29/05	N2				1.0 UJ		5.0 J		50 UJ			2700 J		20 UJ															
MW19	6/7/06	N	2.0 U	17000 J		1.0 UJ		4.4 J		50 UJ			2700 J		20 UJ	59	0.50 U	1.5 J	1.3 J	22		120 J	18 J		360 J	0.76 J	36 =		20 J	
MW19	9/27/06	N	2.0 UJ	8200 J		1.0 U		6.4 J		50 U			3100		20 U	69	0.50 U	1.4 J	1.2 J	19		160 J	14		190	0.66 J	30 =		35	

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Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Arsenic (dissolved)	Arsenic	Copper (dissolved)	Copper	Iron (dissolved)	Iron	Magnesium	Manganese (dissolved)	Manganese	Zinc (dissolved)	Zinc	Pentachlorophenol	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, hydroxide (as CaCO3)	Alkalinity, total (as CaCO3)	Chloride	Hardness, carbonate	Hardness	Nitrate (as N)	Sulfate	TOC averages	Total organic carbon (TOC)	
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
MW19	5/9/07	N	2.0 UJ	11000 J		1.0 UJ		3.7 J		100 UJ			2600		20 UJ	54 J	1.0 U	1.4	1.5	17		230 =	15		160	0.29	59 J		33 UB	
MW19	9/21/07	N		3500 J		1.0 UJ		4.0 J		100 UJ			3100		20 UJ	47 R	1.0 U	1.8	2.0	21		190 J	17		240 J	0.28	42 J		38 J	
MW19	5/20/08	N	2.0 U	23000 J		1.0 U		3.4		100 UJ			2900		2.3 J	140	1.0 UJ	5.0	4.8	54 J		220 =	16		260	0.44	42		18 J	
MW19	10/24/08	N	2.1 J	27900		2 UJ		5 J		510 J	28700 J		4850 J		20 UJ	120	0.5 U	5.11	5.08 =	50.3		221 J	15.9		373 J	0.04 J	46.2		29.8	
MW19	6/2/09	N	3.9 J	18600 J		2 U		10 UJ		222 =	29900 =		4050 =		20 U	110 J	0.5 U	7.93	6.66	74.6	249 J		12.8	317.6445	0.01 UB	44.7		13		
MW19	10/7/09	N	2 J	31800 J		2 UJ		3.8 J		237 J	27400 J		3190 J		7.2 J	137 J	0.1 UJ	7.62 J	5.77 J	60.7 J		228 J	14.3 J		271.39 J	0.05 UJ	42 J		20.4 J	
MW19	5/20/10	N	1.4	26000.		2 UJ		3.2 J		92.2 UJ	19900. J		1870. J		20 UJ	123.	0.5 U	7.95	5.65	64.3		136	21.5		199	0.05 UJ	32.4		50.4 UB	
MW19	10/7/10	N	1.3 U	4470 J		2 U		2.9 J		114	7130		942		20 U	102 J	0.5 UJ	3.21 J	1.7 J	44.7 J		84	13.6 J		77.8	0.10 UJ	18.7 J		17.4	
MW19	6/29/11	N	0.9 U	8880		2 UJ		14.8 J		8880			1300		20 U	42.1	0.1 U	1.12	1.09	22.7		43	16.6 J		90.00	0.26	20.1		85.4	
MW19	10/20/11	N	0.33 J	13000		2.0 U		12 B		52 J+	8600 B		1700		14 J+	2.8	0.84 U	1.1 J	1.0 J	23		57	19		85.40	0.30	17		92	
MW19	5/22/12	N	0.71	5300		2.0 U		7.6 J		50 U	7600 =		1300		20 U	50	2.0 U	0.88 J	0.76 J	16		51	15		76.20	1.1	12		38	
MW19	10/17/12	N	0.50 U	8100		2.0 U		6.9 J		50 U	5800 =		900		20 U	8.4	2.0 U	4.0 U	0.67 J	9.7		36	12		66.3	1.4	11 J		27	
MW19	5/22/13	N	0.84 J	5800		2.0 U		7.3 J		50 U	8700 B		1100 B		20 U	29 J	0.50 U	0.99 J	1.5	19		54	14			1.1 J	11		45	
MW19	10/10/13	N	0.50 U	7900		0.26 J		10.0 UJ		50 UJ	5800 J		990 J		20 UJ	3.0	2.5 U	5.0 U	1.1 J	15		36 B	12			1.1 J	11		31	
MW19	5/14/14	N		18000																										
MW20	10/15/97	N	10 U	29000 J													0.1 U	1 U	1 U	0.1 U										
MW20	4/26/01	N	2.73	36600		8.2		196		33200			3120		126	9970 =	1 U	10 U	10 U	29		198	24		301	0.13 U	67		478	
MW20	4/26/01	N2	2.73			1.1		14		841			2250		23	9970	10 U	100 U	100 U	71										
MW20	9/12/01	N	10 U	83000		3.6		81		7900			3200		36	890	0.44 U	3.4 U	4.1 U	37		260 J	16		250	0.15 J	24		65	
MW20	9/12/01	N2				1.5		15 U		35 U			2800		12 U															
MW20	8/7/02	N	10.0 U	30000 J		8.9		87.4		4910			3520		16.6 J	1400	1 U	12	9	120		220	22		4 U	0.15 U	25		71	
MW20	8/7/02	N2				2.6		5.8 J		206			3280		15.4 J															
MW20	9/25/03	N	5.4	13000		2 J		58		7220			3310		20 J	830	1 U	10 U	10 U	60.9		233	19.4 J		86.67	1.25 U	80 J		150 J	
MW20	9/25/03	N2	5.4			1 U		11		350			3250		10 J												1.25 U			
MW20	9/22/04	N	10.0 UJ	133000		1.00 UJ		30.4 J		1320 J			2770 J		18.7 J	282	2.50 U	3.01 J	3.21 J	40.3		190 J	24 J		1320 J	0.29 J	23 R		46.3 R	
MW20	9/22/04	N2				0.498 J		35.2 J		2070			2320		47.0 J															
MW20	10/25/05	N	2.0 UJ	63000 =		1.0 U		16 J		780 J			2300 J		20 UJ		0.50 U	5.5	5.4	62		170 J	13 J		190 J	2.1 J	39 R		21 R	
MW20	10/25/05	N2				1.0 UJ		2.7 UJ		140 J			2400 J		20 UJ															
MW20	9/27/06	FD	2.0 UJ	44000 J		1.0 UJ		4.8 J		94 J			4200		20 U	180 =	0.50 U	5.1	4.1 J	53		230 J	16		380	0.19	65 =		22	
MW20	9/27/06	N	2.0 UJ	35000 J		1.0 U		3.8 J		48 J			4200		20 U	160 =	0.50 U	4.8 J	4.1 J	51		220 J	16		240	0.22	71 =		23	
MW20	9/21/07	N	2.0 U	9500 J		1.0 UJ		10 UJ		100 UJ			4800		20 UJ	71 R	1.0 U	6.4	4.4	62		230 J	18		300 J	0.10 U	98 J		13 J	
MW20	10/23/08	N	2.0 UJ	41000		2 UJ		17.3 J		462	31700 J		3400 J		20 UJ	1150	0.5 U	2.99 =	2.94 =	38.7		127 J	15.7		332 J	0.13 J	28.9		121	
MW21	2/9/98	FD	10	1		3.1		83.9		7.3 U			1380		98.9		0.1 U	1 U	1 U	1 U		196	67.3				8.9		0.47 U	
MW21	2/9/98	FD2				2 U		9.5 U							33.8															
MW21	2/9/98	N	11	1 U		3		70.1		5.5 U			1210		113		0.1 U	1 U	1 U	1 U		176	70.6				9.1		0.47 U	
MW21	2/9/98	N2		1 U		2 U		9.5 U							32.6 U		0.1 U	1 U	1 U	1 U										
MW21	5/14/02	N				1.9 J		1.3 J		130			9.7 J		11 J															
MW21	8/6/02	N		0.035 J		4.4		50		10000			930		29	5 U	1 U	5 U	5 U	5 U		120	49		150	0.15 U	9.6		8.3	
MW21	8/6/02	N2				1.6 J		0.3 U		11 U			0.63 J		6.8 J															
MW21	4/29/03	N	0.5 U	0.15		1 U		12		3440			227		10 U	7.4 U	0.5 U	5 U	5 U	5 U		144	41		169	2.5	12		1.5	
MW21	4/29/03	N2	0.5 U			1 U		1 U		25 U			5 U		10 U															
MW21	9/24/03	N	0.5 U	0.063 J		1 U		260		68400			3750		150	1 U	0.25 U	2.5 U	2.5 U	2.5 U		165	48		81.46	2.62	2 U		3.6	
MW21	9/24/03	N2	0.5 U			1 U		1 U		50 UJ			5 U		10 U															
MW21	5/4/04	N	10.0 U	0.135 UB		2.31 J		72.5 R		14000 R	19300		1970 R		46.5 R	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U		165	67 =		188	2.3 J	3.6 R		3.12 J	
MW21	5/4/04	N2				0.122 J		1.28 R		28.6 R			0.718 R		4.48 R															

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane ug/L	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CaCO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
MW21	9/21/04	N	10.0 UJ	0.474		1.80 J		48.2 J		10300 J			983 J		32.6 J	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U		150 J	63 J		1030 J	2.4 J	4.8 R		2.76 R
MW21	9/21/04	N2				0.130 J	N2	0.955 J		25.0 UJ			0.484 J		3.30 J														
MW21	5/10/05	N	2.0 U	0.33		1.0 U		10 U		50 U			0.47 J		20 U	0.98 U	0.50 U	5.0 U	5.0 U	5.0 U		130 J	49 J		170 J	2.8 J	12 R		2.2 R
MW21	5/10/05	N2				1.0 U		25		6200			480		16 J														
MW21	9/27/05	N	2.0 UJ	0.046 J		7.1		230		56000			3400		110	0.91 U	0.50 U	5.0 U	5.0 U	5.0 U		130 J	47 J		370	2.4 J	17 J		1.2
MW21	9/27/05	N2				1.0 UJ		2.6 J		36 J			9.8 J		20 U														
MW21	6/1/06	N	2.0 U	0.023 J		1.0 UJ		10 UJ		47 J			17 J		20 UJ	0.99 U	0.50 U	5.0 U	5.0 U	5.0 U		140 J	65 J		140	2.7 J	20		1.5 J
MW21	5/8/07	N	2.0 UJ	0.098 UJ		1.0 UJ		10 UJ		100 UJ			10 UJ		4.2 J	1.0 R	1.0 U	1.0 U	1.0 U	2.0 U		210 =	33 J		120	4.2	9.3 J		1.7
MW21	9/18/07	N	2.0 UJ	0.13 J		1.0 UJ		10 UJ		100 UJ			10 UJ		20 UJ	0.98 R	1.0 U	1.0 U	1.0 U	2.0 U		110 J	29		120 J	3.7 J	12 J		1.2 J
MW21	10/21/08	N	2.0 UJ	0.10 UJ		2 U		10 UJ		294 J	14900 J		10 U		20 U	1.00 U	0.50 U	2.00 U	2.0 U	5.00 U		66	68.80		149 J	2.69 J	7.27 U		2.38 J
MW21	4/6/16	N	0.092 J	0.70 J		1.0 J		22.8 J			1.7 J		7.3 U		0.016 Jp*	0.063 U	0.35 U	0.25 U	0.23 U	0.52 U		25.9 B	101		83.6	1.8 H	6.8		0.63 JB
MW21	7/20/16	N	0.11 J	0.49 U		1.3 J		29.4 J			1.1 U		7.3 U		8.5	0.062 U	0.35 U	0.25 U	0.23 U	0.52 U		29.4 B	84.5	84		1.7	6.8	0.93 J	
MW21	7/20/16	FD	0.080 U	0.49 U		0.86 J		23.5 J			1.1 U		7.3 U		5.5	0.075 U	0.35 U	0.25 U	0.23 U	0.52 U		29.9 B	84.9	78		1.7	6.6	0.90 J	
MW21	10/11/16	N	0.080 U	0.38 J		1.8 JB		6.2 JB			0.44 JB		6.2 U		5.7	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U		30.5	74.4	82		1.8	6.6	0.61 JB	
MW22	2/9/98	N	13	1 U		4		255		5.5 U			3700		121		0.1 U	1 U	1 U	1 U		186	56.3			17.9			0.47 U
MW22	2/9/98	N2		1 U		2 U		9.5 U							12.6		0.1 U	1 U	1 U	1 U									
MW22	5/14/02	N				1.4 U		0.3 U		22.9 J			3.5 J		2.7 J														
MW22	8/6/02	N	10.0 U	0.078		2.2 J		9.8 J		2500			170		7.3 J	5 U	1 U	5 U	5 U	5 U		150	7.2		170	0.15 U	12		1.3
MW22	8/6/02	N2				1.4 U		0.3 U		25 J			0.42 U		4.9 J														
MW22	9/24/03	N	0.5 U	0.34		7		140		56900			2570		120 J	1 U	0.25 U	2.5 U	2.5 U	2.5 U		132	4.9		101.8	2.15	3 J		1.7
MW22	9/24/03	N2	0.5 U			1 U		20		2770			542		20 J														
MW22	9/21/04	N	10.0 UJ	0.220		2.76 J		71.6 J		13600 J			963 J		48.4 J	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U		130 J	11 J		885 J	2.2 J	6.7 R		3.86 R
MW22	9/21/04	N2				0.164 J	N2	0.473 J		25.0 UJ			15.0 UJ		2.31 J														
MW22	9/28/05	N	2.0 U	0.16 J		1.0 UJ		9.8 J		2100 J			130 J		8.0 J	1.0 U	0.50 U	5.0 U	5.0 U	5.0 U		91 J	9.6 J		130 J	1.7 J	18 R		0.94 J
MW22	9/28/05	N2				1.0 UJ		10 UJ		50 UJ			1.3 J		20 UJ														
MW22	9/18/07	N	2.0 UJ	0.13 J		1.0 UJ		10 UJ		100 UJ			10 UJ		20 UJ	0.99 R	1.0 U	1.0 U	1.0 U	2.0 U		110 J	8.2		160 J	2.5 J	10 J		1.0 J
MW22	5/20/08	N	2.0 UJ	0.77 J		1.0 U		0.98 J		100 UJ			3.6		5.4 J	0.95 U	1.0 UJ	1.0 U	1.0 U	2.0 UJ		110 =	8.4		200	2.3	12		3.0 J
MW22	10/21/08	N	2.0 UJ	0.09 UJ		2.60 J		10 UJ		303 J	11100 J		0.01 U		20 U	1.00 U	0.5 U	2.0 U	2.0 U	5.0 U		90	4.69		111 J	1.48 J	6.95		21.10 J
MW22	6/2/09	N	0.8 UJ	0.1 UJ		2 U		10 UJ		83.1 =	10000 J		10 U		20 U	1.0 UJ	0.5 U	0.22 J	2.0 U	5.0 U		70 J	6.92		99.6098	1.97 J	6.73		1.7 UJ
MW22	10/6/09	N	0.83 UJ	0.1 UJ		2 UJ		13.1 J		1560 J	11500 J		168 J		6.7 J	0.994 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ		147 J	7 J		106.54 J	5.31 J	7.53 J		8.62 J
MW22	5/18/10	N	1.3 U	0.1 U													0.5 U	5 U	5 U	5 U		66 UB	9.21			1.9 J	6.9		58.8 UB
MW22	10/6/10	N	1.3 U	0.13 UB		2 U		4.1 J		74.2 J	3680		16.7 U		20 U	1.0 U	0.1 U	0.4 U	0.4 U	1 U		62	1.8 J		40.9	0.90 J	5.6 J		24.6
MW22	6/29/11	N	0.9 U	0.1 U		2 UJ		4.5 J		499	3700		27.6		20 U	0.999 U	0.1 U	0.4 U	0.4 U	1 U		32.	0.78 J+		34.10	0.46 J	3.9 J		11
MW22	10/18/11	N	0.50 U	0.098 U		0.45 J		2.1 J+		50 U	3600 B		2.7 J		10 U	0.20 U	0.50 U	1.0 U	1.0 U	2.0 U		43	1.0 U		37.30	0.50 J	3.5 J		1.0 U
MW22	5/22/12	N	0.50 U	0.084 J		2.0 U		2.3 J		160	5000 =		13		20 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		49	3.4		50.60	0.76 J	3.9 J		10
MW22	10/16/12	N	0.50 U	0.096 U		0.59 J		10 U		50 U	5000 =		5.7 J		20 U	0.19 U	2.5 UJ	5.0 UJ	5.0 UJ	10 UJ		48	4.1		53.1	0.48 J	5.0 U		36
MW22	5/22/13	N	0.50 U	0.11		2.0 U		10 U		50 U	4000 B		10 U		20 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		41	3.7			1.0 J	3.9		15
MW22	10/8/13	N	0.50 U	0.14		0.24 J		10.0 U		50 U	5200 B		2.8 J		20 U	0.20 U	0.50 U	1.0 U	1.0 U	2.0 U		45	7.2			1.4 J	4.7		10
MW22	5/14/14	N		0.093 J																									
MW22	9/24/14	N	0.070 U	0.27	0.22 J		0.75 U		25 JB			19		7.3 U		0.060 U	0.24 U	0.23 U	0.22 U	0.43 U		51	1.7	60		0.69	3.6	0.71 J	
MW22	4/21/15	N	0.070 U	0.072 J	0.60 JB		2.8		390 B			23		7.3 U		0.065 U	0.35 U	0.25 U	0.23 U	0.52 U		42 B	1.9		57	0.69	3.7		0.57 J
MW22	10/13/15	N	0.080 U	0.49 U		1.2 J		16.0 U			1.1 U		7.3 U		0.041 J	0.060 U	0.35 U	0.23 U	0.25 U	0.52 U		46.3 B	1.7	52.3		0.65 H	2.8	0.74 J	
MW22	4/6/16	N	0.080 U	0.49 U		0.92 J		17.5 J			2.2 J		7.3 U		0.025 Jp*	0.061 U	0.35 U	0.25 U	0.23 U	0.52 U		50.8 B	1.3		57.7	0.61 H	2.9		5.3 B
MW22	7/20/16	N	0.080 U	0.49 U		3.4		235			10		7.3 U		0.030 J	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		58.6 B	1.2	64		0.6	3.1	1.7	
MW22	10/12/16	N	0.080 U	0.41 J		1.7 JB		85.4 JB			5.4 B		6.2 U		0.043 J	0.061 U	0.28 U	0.26 U	0.23 U	0.24 U		67.2	1.7	70		0.53 H	3.5	0.96 J	

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane ug/L	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CaCO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
MW23	2/26/98	N	57	1 U		2 U		17.6 U		5.5 U			128		43.6		2	1 U	77	2		120	8.7				7.6		0.47 U
MW23	2/26/98	N2		1 U		2 U		14.2 U							6.6		2 =	1 U	77 =	2 =									
MW23	9/11/01	N	10 U	0.49		1.2		6.3 J		630			140		37	0.24 U	0.44 U	0.5 U	0.4 U	1.2 U		110	10		140	0.13 U	8.2 U		5.6
MW23	9/11/01	N2				0.62 J		2.2 U		35 U			29		4.7 J														
MW23	4/13/16	N	0.080 U	0.58 J		0.75 U		35.1 J			1.1 U		7.3 U		0.015 U	0.063 U	0.35 U	0.25 U	0.23 U	0.52 U		197	29.5		255	1.8	7.1		0.62 J
MW23	7/20/16	N	0.080 U	0.70 J		0.75 U		16.0 U			1.1 U		7.3 U		0.31	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		195 B	30.6	230		1.8	7.2	0.66 J	
MW23	10/11/16	N	0.080 U	0.71 J		0.90 JB		5.3 U			0.38 JB		6.2 U		0.015 U	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U		194	32.3	230		1.9	8.1	0.54 JB	
MW24	2/8/98	N	10 U	4 U		4.3		53		5.5 U			1030		50.7		3 U	2 U	3 U	5 U		253	18.7				5.2		1.8
MW24	2/8/98	N2		4 U		2 U		9.5 U							23		3 U	2 U	3 U	5 U									
MW24	12/6/00	N	0.53 U	123 J		1.6		27		6500			530		11	5.9 U	0.1 U	1 U	0.29	1 U		180	21		310	2.3	7.1		5.5
MW24	12/6/00	N2	0.53 U			0.29		25 U		25 U			15 U		25 U	5.9 U	0.1 U	1 U	0.29	1 U									
MW24	4/24/01	N	0.1 U	0.11		2.4		30		7310			508		23	5.3 U	0.1 U	1 U	1 U	1 U		256	36		348	3.64 =	12		3.36
MW24	4/24/01	N2	0.1 U			0.29		5.2		25 U			2.4		11	5.3 U											3.64		
MW24	4/7/16	N	0.11 J	0.49 U		3.0		420			28.4		7.3 U		0.044 Jp*	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		168 B	9.1		135	1.9	17.4		0.79 JB
MW25	2/9/98	N	17	1		6.6		462		30.2 U			4480		321		0.1 U	1 U	1 U	1 U		455	15.6			9.9		0.47 U	
MW25	2/9/98	N2		1 =		2 U		9.5 U							16.4		0.1 U	1 U	1 U	1 U									
MW25	4/11/16	N	0.080 U	1.1 J		17.6 B		6090 B			148 B		12.4 JB		0.024 Jp	0.064 U	0.35 U	0.25 U	0.23 U	0.52 U		33.7 B	37.8		137	2.4	3.8		1.5
MW25	7/26/16	N	0.080 U	0.35 U		1.3 J		28.8 J			1.0 J		6.2 U		0.30 B	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		40.3	49.1	108		3.2	5	0.70 J ^	
MW25	10/10/16	N	0.080 U	0.35 U		0.62 JB		5.4 JB			0.46 JB		6.2 U		0.23	0.062 U	0.28 U	0.26 U	0.23 U	0.24 U		31.1	17.5	52		1.6 H	2.8	0.44 JB	
MW25	10/10/16	D	0.080 U	0.35 U		0.71 JB		5.3 U			0.27 JB		6.2 U		0.17	0.066 U	0.28 U	0.26 U	0.23 U	0.24 U		31.1	16.9	54		1.6	2.7	0.44 JB	
MW26	12/6/00	N	0.65 U	118 J		1.1		21		25 U			94		17	5 U	0.1 U	1 U	1 U	1 U		230	29		350	2.8	540		8
MW26	12/6/00	N2	0.65 U	115 J		2.8		27		16000			300		35	5 U	0.1 U	1 U	1 U	1 U		270	28		330	2.8	770		6.1
MW26	12/6/00	N3	0.7 U			4		25 U		25 U			89		25 U	5 U	0.1 U	1 U	1 U	1 U									
MW26	12/6/00	N4				1.1		25		16000			290		33														
MW26	4/24/01	N	0.1 U	0.1 U		3		13		6980			132		24	5.4 U	0.1 U	1 U	1 U	1 U		240	22		294	5 =	10		2.79
MW26	4/24/01	N2	0.1 U			0.24		25 U		36			15 U		19700												5		
MW26	6/18/01	N	0.1 U	1		1.1		25 U		25 U			15 U		25 U	5 U	0.1 U	1 U	1 U	1 U		230	27		326	30	13		6.67
MW26	6/18/01	N2	0.1 U			3.6		18		9140			232		28												30 =		
MW26	9/10/01	N	10 U	0.16 J		1.5		10 U		2300			94		24	0.24 U	0.44 U	0.5 U	0.4 U	1.2 U		260	30		300	3.2	12		0.34 U
MW26	9/10/01	N2	10 U	0.16 J		0.8 J		4 J		100 J			4 U		3.8 J	0.24 U	0.44 U	0.5 U	0.4 U	1.2 U		260	29		310	3.2	12		2.7
MW26	9/10/01	N3				0.75 J		2.9 J		55 J			1.5 U		3.7 U														
MW26	9/10/01	N4				1.6		13		2500			96		24														
MW26	5/14/02	N		0.1		1.4 J		5 J		1530			57.2		9.7 J	5 U	1 U	5 U	5 U	5 U		260	27		300	3 H	15		5
MW26	5/14/02	N2				1.4 U		1.2 J		11.2 U			0.73 J		9.3 J										300				
MW26	8/5/02	N	10.0 U	0.03 J		3		2.5 J		385			17.2		16.3 J	5 U	1 U	5 U	5 U	5 U		270	18		310	0.15 U	14		4.5
MW26	8/5/02	N2	10.0 U	0.035 J		1.4 U		0.3 U		11.2 U			0.56 J		13.7 J	5 U	1 U	5 U	5 U	5 U		280	19		310	0.15 U	11		24
MW26	8/5/02	N3				2.7		3.9 J		728			26		18.7 J														
MW26	8/5/02	N4				3.2		0.3 U		11.2 U			0.42 U		7.4 J														
MW26	4/29/03	N	0.5 U	0.1 U		1 U		4		1290			46		10 U	7.1 U	0.5 U	5 U	5 U	5 U		248	18		262	3.5	14		7
MW26	4/29/03	N2	0.5 U	0.11 U		1 U		2 J		25 U			5 U		10 U	7.1 U	0.5 U	5 U	5 U	5 U		250	18.7		257	3.6	14		12
MW26	4/29/03	N3	0.5 U			2 J		5		1690			48		20														
MW26	4/29/03	N4				1 U		1 U		25 U			5 U		10 U														
MW26	9/23/03	N	0.5 U	0.11 U		1 U		1 J		740			29		10 U	1 U	0.25 U	2.5 U	2.5 U	2.5 U		250	11		90.28	3.74	2 U		6.4
MW26	9/23/03	N2	0.5 U			1 U		1 U		50 U			5 U		10 U														
MW26	5/4/04	FD	10.0 U	0.219 UB		0.295 J		2.37 R		399 R	27400		15.2 R		7.82 R	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U		242	17 =		291	4.0 J	44 R		4.35 J

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Arsenic (dissolved)	Arsenic	Copper (dissolved)	Copper	Iron (dissolved)	Iron	Magnesium	Manganese (dissolved)	Manganese	Zinc (dissolved)	Zinc	Pentachlorophenol	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, hydroxide (as CaCO3)	Alkalinity, total (as CaCO3)	Chloride	Hardness, carbonate	Hardness	Nitrate (as N)	Sulfate	TOC averages	Total organic carbon (TOC)
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
MW26	5/4/04	FD2				0.323 J		1.19 R		49.3 R			2.07 R		4.15 R														
MW26	5/4/04	N	10.0 U	0.242 UB		0.264 J		2.62 R		458 R	26700		17.8 R		10.5 R	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U		242	17 =		284	3.9 J	42 R		3.75 J
MW26	5/4/04	N2				0.289 J		1.24 R		39.0 R			1.23 R		4.36 R														
MW26	9/23/04	FD	10.0 U	5.97 BE		1.00 U		3.10 J		542			22.2		6.95 J	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U		280	28		1770	1.5 J	170 =		1.95
MW26	9/23/04	FD2		4.11 =		0.354 J		2.01 J		6.48 J			4.00 J		3.80 J														
MW26	9/23/04	N	10.0 U	0.393 =		1.00 U		3.73 J		620			24.8		7.86 J	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U		280	28		1670	1.5 J	120 =		2.40
MW26	9/23/04	N2				0.314 J		1.57 J		8.81 J			19.3		4.70 J														
MW26	5/10/05	FD	2.0 U	0.11 U		1.0 U		10 U		50 U			0.59 J		20 U	0.93 U	0.50 U	5.0 U	5.0 U	5.0 U		240 J	26 J		370 J	2.2 J	180 R		1.1 R
MW26	5/10/05	FD2				1.0 U		2.2 J		510			14		17 J														
MW26	5/10/05	N	2.0 U	0.061 J		1.0 U		10 U		50 U			1.8 J		20 U	0.94 U	0.50 U	5.0 U	5.0 U	5.0 U		250 J	26 J		340 J	2.8 J	200 R		2.1 R
MW26	5/10/05	N2				1.0 U		2.4 J		680			18		7.5 J														
MW26	9/27/05	FD	2.0 UJ	0.024 J		1.0 UJ		10 U		50 U			1.7 J		20 U	0.92 U						250 J	25 J		380	2.0 J	160 J		0.68 J
MW26	9/27/05	FD2				1.0 UJ		2.6 J		50 UJ			10 U		20 U														
MW26	9/27/05	N	2.0 UJ	0.027 J		1.0 UJ		10 U		50 U			2.3 J		20 U	0.93 U	0.50 U	5.0 U	5.0 U	5.0 U		240 J	25 J		350	1.9 J	170 =		0.72 J
MW26	9/27/05	N2				1.0 UJ		2.2 J		50 U			10 U		20 U														
MW26	6/7/06	FD	2.0 U	0.091 J		1.0 UJ		10 UJ		50 UJ			1.0 UJ		20 UJ	0.94 U	0.50 U	5.0 U	5.0 U	5.0 U		250 J	29 J		350 J	1.8 J	150 =		0.94 J
MW26	6/7/06	N	2.0 U	0.11 UJ		1.0 UJ		10 UJ		50 UJ			2.5 UJ		20 UJ	0.95 U	0.50 U	5.0 U	5.0 U	5.0 U		260 J	29 J		320 J	1.8 J	140 =		1.4 J
MW26	9/26/06	N	2.0 UJ	0.11 U		1.0 UJ		10 UJ		50 UJ			10 UJ		20 UJ	0.91 U	0.50 U	5.0 U	5.0 U	5.0 U		270 J	23 J		350	1.5 J	87 J		2.0
MW26	5/8/07	FD	2.0 UJ	0.095 UJ		1.0 UJ		10 UJ		100 UJ			10 UJ		20 UJ	0.92 R	1.0 U	1.0 U	1.0 U	2.0 U		270 =	21 J		360	1.6	250 J		0.76 J
MW26	5/8/07	N	2.0 UJ	0.093 UJ		1.0 UJ		10 UJ		100 UJ			10 UJ		20 UJ	0.92 R	1.0 U	1.0 U	1.0 U	2.0 U		260 =	21 J		360	1.5	210 J		0.68 J
MW26	9/19/07	N	2.0 UJ	0.095 U		1.0 UJ		10 UJ		100 R			10 UJ		20 UJ	0.93 U	1.0 U	1.0 U	1.0 U	2.0 U		240	25		500 J	1.3	220 J		0.84 J
MW26	5/20/08	N	2.0 UJ	0.096 UJ		0.34 J		0.47 J		100 UJ			2.5 U		20 U	0.96 U	1.0 UJ	1.0 U	1.0 U	2.0 UJ		240 =	22		430	1.8	230		0.65 J
MW26	10/22/08	N	2.0 UJ	0.1 U		2 UJ		6.2 J		777 J	35100 J		10 UJ		20 UJ	1 U	0.5 U	2.0 U	2.0 U	5.0 U		256 J	21.7		432 J	2.36 J	235		18.6
MW26	6/2/09	N	0.8 UJ	0.1 UJ		2 U		10 UJ		341 =	33400 =		10 U		20 U	1.0 UJ	0.5 UB	0.3 J	2.0 UB	5.0 U	229 J		203		414.7082	1.83 J	2360		1.7 UJ
MW26	10/6/09	N	0.83 UJ	0.1 UJ		2 UJ		3.8 J		325 J	42900 J		10 UJ		20 UJ	0.997 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ		227 J	20.7 J		491.28 J	1.7 J	212 J		1 UJ
MW26	5/19/10	N	1.3 U	0.13 J		1.8 J		10 UJ		236. J	39800. J		10 UJ		15. J	1.0 U	0.5 U	5 U	5 U	5 U		230	20.4		486	2.41 J	279		20.1 J
MW26	10/5/10	N	1.3 U	0.1 UJ		2 U		10 U		376	37900		10 U		20 U	1.0 U	0.1 U	0.4 U	0.4 U	1 U		236	20.0 J		478	1.77	232		0.6 J
MW26	6/29/11	N	0.9 U	0.1 U		2 UJ		10 U		274	41600		10 U		20 U	0.992 U	0.1 U	0.4 U	0.4 U	1 U		202	18.3 J		463.00	1.83 J	230		1 U
MW26	10/19/11	N	0.50 U	0.099 U		0.87 J		2 U		50 U	29000 B		10 U		10 U	0.20 U	0.50 U	1.0 U	1.0 U	2.0 U		230	19		329.00	1.6 J	200		0.88 J
MW26	5/22/12	N	0.50 U	0.10 U		2.0 U		10 U		50 U	28000 =		10 U		20 U	0.19 UJ	0.50 U	1.0 U	1.0 U	2.0 U		200	19		325.00	1.7	210		0.43 J
MW26	10/16/12	N	0.50 U	0.095 U		0.99 J		10 U		50 U	29000 =		10 U		20 U	0.19 U	0.50 U	1.0 U	1.0 UJ	2.0 U		190	19		344	1.8 J	200 =		0.30 J
MW26	5/22/13	N	0.50 U	0.094 U		2.0 U		10 U		50 U	25000 B		10 U		20 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		170	18			1.9 J	230		0.55 J
MW26	10/8/13	N	0.50 U	0.095 U		0.37 J		10.0 U		50 U	26000 B		10 U		20 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		160	18			1.5 J	110 J		1.0 U
MW26	5/14/14	N		0.095 U																									
MW26	9/24/14	FD	0.070 U	0.015 U	0.32 J		0.75 U		16 U			1.1 U		7.3 U		0.060 U	0.24 U	0.23 U	0.22 U	0.43 U		150	17	280		1.2	160	0.50 U	
MW26	9/24/14	N	0.070 U	0.015 U	0.43 J		0.75 U		16 U			1.1 U		7.3 U		0.060 U	0.24 U	0.23 U	0.22 U	0.43 U		150	17	290		1.2	160	0.50 U	
MW26	4/21/15	FD		0.015 U	0.71 JB		0.75 U		16 U			1.1 U		7.3 U		0.060 U													
MW26	4/21/15	N	0.070 U	0.015 U			0.75 U		16 U			4.4 J		7.3 U		0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		160 B	16		240	2.4	82		0.26 U
MW26	10/13/15	FD	0.080 U	0.50 J		0.75 U		16.0 U			1.1 U		7.3 U		0.015 U	0.061 U	0.35 U	0.23 U	0.25 U	0.52 U		194 B	15.5	235		1.9 H	75.7	0.33 J	
MW26	10/13/15	N	0.080 U	0.76 J		0.75 U		16.0 U			1.1 U		7.3 U		0.015 U	0.061 U	0.35 U	0.23 U	0.25 U	0.52 U		198 B	15.3	229		1.9 H	74.6	0.32 J	
MW26	4/5/16	N	0.15 J	0.57 J		1.5 JB^		21.4 JB			58.7 B		7.3 U		0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		154 B	9.4		183	1.4	36.1		0.26 J
MW27	10/20/11	N	0.10 J	0.17		1.7 J		2.3 J+		50 U	2300 B		10 U		10 U	0.20 U	0.50 U	1.0 U	1.0 U	2.0 U		63	10		28.70	3.1	9.1		1.6
MW27	4/7/16	N	0.092 J	0.59 J		1.9 J		21.1 J			1.1 U		7.3 U		0.15 *	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		137 B	20.0		113	6.5 F1	14.2		1.9 B
MW27	4/7/16	FD		0.49 U		0.75 U		29.9 J			2.3 J		7.3 U		0.015 U*	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
MW28	10/20/11	N	0.19 J	690		0.55 J		2 U		50 U	12000 B		6.0 J		10 U	0.19 U	0.50 U	1.0 U	1.0 U	0.38 J		130	5.5		132.00	1.3	5.2		2.7

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane ug/L	Arsenic (dissolved) ug/L	Arsenic ug/L	Copper (dissolved) ug/L	Copper ug/L	Iron (dissolved) ug/L	Iron ug/L	Magnesium ug/L	Manganese (dissolved) ug/L	Manganese ug/L	Zinc (dissolved) ug/L	Zinc ug/L	Pentachlorophenol ug/L	Naphthalene ug/L	Benzene ug/L	Ethylbenzene ug/L	Toluene ug/L	Xylenes (total) ug/L	Alkalinity, hydroxide (as CaCO3) mg/l	Alkalinity, total (as CaCO3) mg/l	Chloride mg/l	Hardness, carbonate mg/l	Hardness mg/l	Nitrate (as N) mg/l	Sulfate mg/l	TOC averages mg/l	Total organic carbon (TOC) mg/l
MW28	10/17/12	N	0.50 U	0.095 U		0.48 J		10 U		50 U	12000 =		10 U		20 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U		120	11		134	1.8	5.0 U	0.81 J	
MW28	10/9/13	N	0.50 U	0.049 J		2.0 UJ		10.0 UJ		50 UJ	12000 J		10 UJ		20 UJ	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U *		120 J	21			2.2 J	6.5	0.49 J	
MW28	10/9/13	N2																								2.2 J			
MW28	9/25/14	N	0.070 U	0.099	0.31 J		0.75 U		16 U			1.1 U		7.3 U		0.060 U*	0.24 U	0.23 U	0.22 U	0.43 U		120	18	150		1.3	5.1	0.85 J	
MW28	10/14/15	N	0.080 U	0.49 U		0.75 U		16.0 U			1.1 U		7.3 U		0.32	0.060 U	0.35 U	0.23 U	0.25 U	0.52 U		126 B	15.5	155		2	5.4	0.69 J	
MW28	4/6/16	N	0.20 J	0.49 U		0.76 J		29.7 J			2.7 J		7.3 U		47 *	0.065 U	0.35 U	0.25 U	0.23 U	0.52 U		122 B	9.4		125	1.2 H	4.8	1.6 B	
MW28	7/21/16	N	0.10 J	0.49 J		0.75 U		25.9 JB			10.8		7.3 U		100	0.061 U	0.35 U	0.25 U	0.23 U	0.52 U		127	11.4	138		1.9	5.4	1.9	
MW28	10/13/16	N	0.28 JB	0.39 J		0.76 JB		9.8 JB			8.5		6.2 U		1900	0.060 UH	0.28 U	0.26 U	0.23 U	1.4 J		128	11.4	148		1.7 H	5.8	12.3 ^	
MW28	10/13/16	D	0.36 JB	0.38 J		0.61 JB		5.3 U			7.9		6.2 U		1200	0.060 UH	0.28 U	0.26 U	0.23 U	1.4 J		125	11.4	142		1.7 H	5.6	12.3 ^	
MW29	4/13/16	N	1.4	0.49 U		6.7		1660			2270		7.3 U		14000	34	0.35 U	0.58 J	0.90 J	7.2		87.0	4.5		120	0.035 U	6.4	70.2	
MW29	7/21/16	N	0.67	0.49 U		2.1 B		1290 B			2800		7.3 U		11000	35	0.35 U	0.74 J	1.3	9.1		84	9.2	110		0.035 U	10.4	50.5	
MW29	7/21/16	FD	0.69	0.49 U		2.1 B		1250 B			2740		7.3 U		9100	30	0.35 U	0.83 J	1.2	9.3		83.8	9.2	110		0.035 U	10.5	51.6	
MW29	10/14/16	N	0.32 JB	0.35 J		2.6 B		1970 B			3220		6.2 U		20000	32	0.28 U	0.98 J	1.6	11		83	15.9	124		0.035 U	16.3	56.9 ^	
MW30	4/13/16	N	0.080 U	0.49 U		0.81 J		46.1 J			147		7.3 U		0.72	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		42.0	3.2		82.3	3.4	32.8	1.2	
MW30	7/21/16	N	0.080 U	0.49 U		0.75 U		16.0 U			52.9		7.3 U		1.7	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		44.5	2.9	82		4	29.9	1.4	
MW30	10/12/16	N	0.084 J	0.35 U		1.1 JB		13.8 JB			67.3 B		6.2 U		3.8	0.062 U	0.28 U	0.26 U	0.23 U	0.24 U		52.2	3.8	86		1.6 H	30.5	NA	
MW31	4/12/16	N	0.080 U	0.49 U		0.75 U		20.9 JB			7.7 B		7.3 U		0.030 Jp	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U		122 B	0.99 J		125	0.68	4.0	0.59 J	
MW31	7/20/16	N	0.080 U	0.49 U		0.86 J		16.0 U			2.2 J		7.3 U		4.6	0.063 U	0.35 U	0.25 U	0.23 U	0.52 U		105 B	0.76 J	100		0.49	1.9	0.68 J	
MW31	10/13/16	N	0.11 JB	0.35 U		0.76 JB		5.3 U			0.25 U		6.2 U		3.7	0.062 UH	0.28 U	0.26 U	0.23 U	0.24 U		110	0.63 J	104		0.46 H	1.5	0.29 J^	
RW01	10/9/97	N													1 U														
RW01	4/23/01	N													0.1 U	5.3 U	0.5 U	5 U	5 U										
RW01	9/11/01	N													0.071 J	0.26 U	0.44 U	0.5 U	0.4 U	1.2 U									
RW01	9/28/01	N													0.1 U														
RW01	9/28/01	N2													0.05 U														
RW01	5/14/02	N													0.23	5 U	1 U	5 U	2 J	2 J									
RW01	8/6/02	N													0.04	5 U	1 U	5 U	5 U	5 U									
RW01	4/29/03	N													0.1 J	7.1 U	0.5 U	5 U	5 U	5 U									
RW01	9/23/03	N													0.28	0.97 U	0.25 U	2.5 U	2.5 U	2.5 U									
RW01	11/20/03	N													0.24														
RW01	5/4/04	FD													0.134 UB	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U									
RW01	5/4/04	N													0.140 UB	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U									
RW01	9/22/04	FD													1.51	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U									
RW01	9/22/04	N													0.201	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U									
RW01	11/1/04	N													0.0952 U														
RW01	5/10/05	FD													0.053 J	0.93 U	0.50 U	5.0 U	5.0 U	5.0 U									
RW01	5/10/05	N													0.068 J	0.93 U	0.50 U	5.0 U	5.0 U	5.0 U									
RW01	7/7/05	FD													0.035 J	0.96 U	0.50 U	5.0 U	5.0 U	5.0 U									
RW01	7/7/05	N													0.043 J	0.95 U	0.50 U	5.0 U	5.0 U	5.0 U									
RW01	9/27/05	FD													0.049 J	0.93 UJ	0.50 U	5.0 U	5.0 U	5.0 U									
RW01	9/27/05	N													0.050 J	0.92 UJ	0.50 U	5.0 U	5.0 U	5.0 U									
RW01	5/31/06	FD													0.055 J	0.94 U	0.50 U	5.0 U	5.0 U	5.0 U									
RW01	5/31/06	N													0.048 J	0.93 U	0.50 U	5.0 U	5.0 U	5.0 U									
RW01	9/25/06	FD													0.023 J	0.93 U	0.50 U	5.0 U	5.0 U	5.0 U									
RW01	9/25/06	N													0.11 U	0.93 U	0.50 U	5.0 U	5.0 U	5.0 U									
RW01	5/9/07	FD													0.048 J	0.95 R	1.0 U	1.0 U	1.0 U	2.0 U									

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Arsenic (dissolved)	Arsenic	Copper (dissolved)	Copper	Iron (dissolved)	Iron	Magnesium	Manganese (dissolved)	Manganese	Zinc (dissolved)	Zinc	Pentachlorophenol	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, hydroxide (as CaCO3)	Alkalinity, total (as CaCO3)	Chloride	Hardness, carbonate	Hardness	Nitrate (as N)	Sulfate	TOC averages	Total organic carbon (TOC)
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
RW01	5/9/07	N													0.035 J	0.95 R	1.0 U	1.0 U	1.0 U	2.0 U									
RW01	9/18/07	FD													0.27 R	0.93 R	1.0 U	1.0 U	1.0 U	2.0 U									
RW01	9/18/07	N													0.093 UJ	0.93 R	1.0 U	1.0 U	1.0 U	2.0 U									
RW01	5/20/08	FD													0.066 J	0.95 U	1.0 UJ	1.0 U	1.0 U	2.0 UJ									
RW01	5/20/08	N													0.060 J	0.95 U	1.0 UJ	1.0 U	1.0 U	2.0 UJ									
RW01	10/23/08	FD														1 U													
RW01	10/23/08	N														1 U													
RW01	12/11/08	FD													0.1 U		0.1 U	0.4 U	0.4 U	1.0 U									
RW01	12/11/08	N													0.1 UJ		0.1 U	0.4 U	0.4 U	1.0 U									
RW01	6/2/09	FD													0.1 UJ	1.0 UJ	0.5 UB	2.0 UB	2.0 UB	5.0 UB									
RW01	6/2/09	N													0.1 UJ	1.0 UJ	0.5 UB	2.0 UB	2.0 UB	5.0 U									
RW01	7/6/09	FD															0.5 U	2.0 U	2.0 U	5.0 U									
RW01	7/6/09	N															0.5 U	2.0 U	2.0 U	5.0 U									
RW01	10/7/09	FD													0.1 UJ	0.997 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ									
RW01	10/7/09	N													0.1 UJ	1 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ									
RW01	5/19/10	FD													0.1 U	1.0 U	0.4 U	5 U	5 U	5 U									
RW01	5/19/10	N													0.1 U	1.0 U	0.4 UJ	5 UJ	5 UJ	5 UJ									
RW01	10/5/10	FD													0.1 U	1.0 U	0.1 U	0.4 U	0.4 U	1 U									
RW01	10/5/10	N													0.1 U	1.0 U	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ									
RW01	11/30/10	N															0.1 U	0.4 U	0.4 U	1 U									
RW01	6/30/11	FD													0.1 U	1 U	0.1 U	0.4 U	0.4 U	1 U									
RW01	6/30/11	N													0.1 U	0.997 U	0.1 U	0.4 U	0.4 U	1 U									
RW01	10/20/11	FD													0.039 J	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW01	10/20/11	N													0.040 J	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW01	12/16/11	FD													0.031 R														
RW01	12/16/11	N													0.096 UJ														
RW01	5/23/12	FD													0.017 J	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW01	5/23/12	N													0.019 J	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW01	7/11/12	FD													0.035 J														
RW01	7/11/12	FD2													0.033 J														
RW01	7/11/12	N													0.027 J														
RW01	10/17/12	FD													0.035 J	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW01	10/17/12	N													0.045 J	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW01	12/3/12	FD													0.094 UJ														
RW01	12/3/12	FD2													0.095 U														
RW01	12/3/12	N													0.094 UJ														
RW01	12/3/12	N2													0.095 U														
RW01	5/21/13	FD													0.029 J	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW01	5/21/13	N													0.031 J	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW01	10/8/13	N													0.040 J	0.20 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW01	10/8/13	N2													0.097 U	0.20 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW01	5/13/14	N													0.051 J														
RW01	9/25/14	N													0.043 J	0.060 U	0.24 U	0.23 U	0.22 U	0.43 U									
RW01	4/21/15	N													0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW01	10/15/15	N													0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									

Appendix A.1
Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Arsenic (dissolved)	Arsenic	Copper (dissolved)	Copper	Iron (dissolved)	Iron	Magnesium	Manganese (dissolved)	Manganese	Zinc (dissolved)	Zinc	Pentachlorophenol	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, hydroxide (as CaCO3)	Alkalinity, total (as CaCO3)	Chloride	Hardness, carbonate	Hardness	Nitrate (as N)	Sulfate	TOC averages	Total organic carbon (TOC)
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
RW01	4/5/16	N													0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW02	10/9/97	FD													2														
RW02	10/9/97	N													0.9 J														
RW02	10/24/97	N													1 U														
RW02	4/8/98	N													1 U														
RW02	4/24/01	N													0.1 U	5.4 U	0.1 U	1 U	1 U	1 U									
RW02	9/11/01	N													9.5	0.25 U	0.44 U	0.5 U	0.4 U	1.2 U									
RW02	9/28/01	N													0.1 U														
RW02	9/28/01	N2													0.1 U														
RW02	9/28/01	N3													0.05 U														
RW02	9/28/01	N4													0.05 U														
RW02	5/14/02	N													0.1	5 U	1 U	5 U	5 U	5 U									
RW02	8/6/02	N													0.04 U	5 U	1 U	5 U	5 U	5 U									
RW02	8/6/02	N2													0.04 U	5 U	1 U	5 U	5 U	5 U									
RW02	4/29/03	N													0.11 U	6.8 U	0.5 U	5 U	5 U	5 U									
RW02	9/24/03	N													0.11 U	0.97 U	0.25 U	2.5 U	2.5 U	2.5 U									
RW02	9/24/03	N2													0.11 U	0.96 U	0.25 U	2.5 U	2.5 U	2.5 U									
RW02	5/4/04	N													0.0252 UB	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U									
RW02	9/22/04	N													0.398	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U									
RW02	11/1/04	N													0.0962 U														
RW02	5/10/05	N													0.11 U	0.93 U	0.50 U	5.0 U	5.0 U	5.0 U									
RW02	9/27/05	N													0.11 U	0.92 UJ	0.50 U	5.0 U	5.0 U	5.0 U									
RW02	5/31/06	N													0.11 UJ	0.93 U	0.50 U	5.0 U	5.0 U	5.0 U									
RW02	9/25/06	N													0.11 U	0.93 U	0.50 U	5.0 U	5.0 U	5.0 U									
RW02	5/9/07	N													0.092 UJ	0.97 R	1.0 U	1.0 U	1.0 U	2.0 U									
RW02	9/18/07	N													0.093 UJ	0.93 R	1.0 U	1.0 U	1.0 U	2.0 U									
RW02	5/20/08	N													0.095 UJ	0.95 U	1.0 UJ	1.0 U	1.0 U	2.0 UJ									
RW02	10/23/08	N														1.33 U													
RW02	12/10/08	N													0.1 U		0.1 U	0.4 U	0.4 U	1.0 U									
RW02	6/2/09	N													0.1 UJ	1.0 UJ	0.5 U	2.0 U	2.0 U	5.0 U									
RW02	10/7/09	N													0.1 UJ	0.997 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ									
RW02	5/19/10	N													0.1 U	1.0 U	0.4 U	5 U	5 U	5 U									
RW02	10/5/10	N													0.1 U	1.0 U	0.1 U	0.4 U	0.4 U	1 U									
RW02	6/30/11	N													0.1 U	0.999 U	0.1 U	0.4 U	0.4 U	1 U									
RW02	10/20/11	N													0.095 U	0.20 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW02	5/23/12	N													0.097 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW02	10/17/12	N													0.037 J	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW02	10/17/12	N2													0.057 J														
RW02	10/17/12	N3													0.094 UJ														
RW02	12/3/12	N													0.095 U														
RW02	12/3/12	N2													0.094 UJ														
RW02	5/21/13	N													0.097 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW02	10/8/13	N													0.094 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW02	5/13/14	N													0.095 U														
RW02	9/25/14	N													0.015 U	0.060 U	0.24 U	0.23 U	0.22 U	0.43 U									

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Arsenic (dissolved)	Arsenic	Copper (dissolved)	Copper	Iron (dissolved)	Iron	Magnesium	Manganese (dissolved)	Manganese	Zinc (dissolved)	Zinc	Pentachlorophenol	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, hydroxide (as CaCO3)	Alkalinity, total (as CaCO3)	Chloride	Hardness, carbonate	Hardness	Nitrate (as N)	Sulfate	TOC averages	Total organic carbon (TOC)
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
RW02	4/21/15	N													0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW02	10/15/15	N													0.015 U	0.061 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW02	4/5/16	N													0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW03	10/9/97	N													1 U														
RW03	9/11/01	N													0.1 J	0.28 U	0.44 U	0.5 U	0.4 U	1.2 U									
RW03	9/28/01	N													0.1 U														
RW03	9/28/01	N2													0.05 U														
RW03	5/14/02	N													0.094 J	5 U	1 U	5 U	5 U	5 U									
RW03	8/6/02	N													0.04 U	5 U	1 U	5 U	5 U	5 U									
RW03	4/29/03	N													0.11 U	6.8 U	0.5 U	5 U	5 U	5 U									
RW03	9/23/03	N													0.11 U	0.96 U	0.25 U	2.5 U	2.5 U	2.5 U									
RW03	5/4/04	N													0.0952 U	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U									
RW03	9/22/04	N													2.18	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U									
RW03	11/1/04	N													0.0962 U														
RW03	5/10/05	N													0.11 U	0.93 U	0.50 U	5.0 U	5.0 U	5.0 U									
RW03	9/27/05	N													0.11 U	0.93 UJ	0.50 U	5.0 U	5.0 U	5.0 U									
RW03	5/31/06	N													0.11 UJ	0.94 U	0.50 U	5.0 U	5.0 U	5.0 U									
RW03	9/25/06	N													0.11 U	0.93 U	0.50 U	5.0 U	5.0 U	5.0 U									
RW03	5/9/07	N													0.092 UJ	0.95 R	1.0 U	1.0 U	1.0 U	2.0 U									
RW03	9/18/07	N													0.093 UJ	0.93 R	1.0 U	1.0 U	1.0 U	2.0 U									
RW03	5/20/08	N													0.097 UJ	0.96 U	1.0 UJ	1.0 U	1.0 U	2.0 UJ									
RW03	10/23/08	N													1 U														
RW03	12/10/08	N													0.1 U		0.1 U	0.4 U	0.4 U	1.0 U									
RW03	6/2/09	N													0.1 UJ	1.0 UJ	0.5 U	2.0 U	2.0 U	5.0 U									
RW03	10/7/09	N													0.1 UJ	0.997 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ									
RW03	5/19/10	N													0.1 U	1.0 U	0.4 UJ	5 UJ	5 UJ	5 UJ									
RW03	10/5/10	N													0.1 U	1.0 U	0.1 U	0.4 U	0.4 U	1 U									
RW03	6/30/11	N													0.1 U	0.994 U	0.1 U	0.4 U	0.4 U	1 U									
RW03	10/20/11	N													0.095 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW03	5/23/12	N													0.097 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW03	10/17/12	N													0.015 J	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW03	12/3/12	N													0.095 U														
RW03	12/3/12	N2													0.095 UJ														
RW03	5/21/13	N													0.053 J	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW03	10/8/13	N													0.096 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW03	5/13/14	N													0.095 U														
RW03	9/25/14	FD													0.015 U	0.060 U	0.24 U	0.23 U	0.22 U	0.43 U									
RW03	9/25/14	N													0.015 U	0.060 U	0.24 U	0.23 U	0.22 U	0.43 U									
RW03	4/21/15	N													0.015 U	0.063 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW03	10/15/15	N													0.015 U	0.061 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW03	4/5/16	N													0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW04	10/9/97	N													1 U														
RW04	4/23/01	N													0.1 U	5 U	0.5 U	5 U	5 U										
RW04	9/11/01	N													0.073 J	0.25 U	0.44 U	0.5 U	0.4 U	1.2 U									
RW04	9/28/01	N													0.1 U														

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Arsenic (dissolved)	Arsenic	Copper (dissolved)	Copper	Iron (dissolved)	Iron	Magnesium	Manganese (dissolved)	Manganese	Zinc (dissolved)	Zinc	Pentachlorophenol	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, hydroxide (as CaCO3)	Alkalinity, total (as CaCO3)	Chloride	Hardness, carbonate	Hardness	Nitrate (as N)	Sulfate	TOC averages	Total organic carbon (TOC)
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
RW04	9/28/01	N2													0.05 U														
RW04	5/14/02	N													0.13	5 U	1 U	5 U	5 U	5 U									
RW04	8/6/02	N													0.04 U	5 U	1 U	5 U	5 U	5 U									
RW04	4/29/03	N													0.11 U	7.4 U	0.5 U	5 U	5 U	5 U									
RW04	9/23/03	N													0.11 U	0.99 U	0.25 U	2.5 U	2.5 U	2.5 U									
RW04	5/4/04	N													0.100 U	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U									
RW04	9/22/04	N													0.266	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U									
RW04	10/1/04	N													0.0962 R														
RW04	5/10/05	N													0.11 U	0.94 U	0.50 U	5.0 U	5.0 U	5.0 U									
RW04	9/27/05	N													0.11 U	0.91 UJ	0.50 U	5.0 U	5.0 U	5.0 U									
RW04	5/31/06	N													0.11 UJ	0.97 U	0.50 U	5.0 U	5.0 U	5.0 U									
RW04	9/25/06	N													0.11 U	0.93 U	0.50 U	5.0 U	5.0 U	5.0 U									
RW04	5/9/07	N													0.093 UJ	0.96 R	1.0 U	1.0 U	1.0 U	2.0 U									
RW04	9/18/07	N													0.093 UJ	0.93 R	1.0 U	1.0 U	1.0 U	2.0 U									
RW04	5/20/08	N													0.093 UJ	0.96 U	1.0 UJ	1.0 U	1.0 U	2.0 UJ									
RW04	10/23/08	N													1 U														
RW04	12/10/08	N													0.1 U		0.1 U	0.4 U	0.4 U	1.0 U									
RW04	6/2/09	N													0.1 UJ	1.0 UJ	0.5 U	2.0 U	2.0 U	5.0 U									
RW04	10/7/09	N													0.15 J	0.994 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ									
RW04	10/20/09	N													0.1 UJ														
RW04	5/19/10	N													0.1 U	1.0 U	0.4 UJ	5 UJ	5 UJ	5 UJ									
RW04	10/5/10	N													0.1 U	1.0 U	0.1 U	0.4 U	0.4 U	1 U									
RW04	6/30/11	N													0.1 U	0.992 U	0.1 U	0.4 U	0.4 U	1 U									
RW04	10/20/11	N													0.095 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW04	5/23/12	N													0.094 U	0.20 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW04	10/17/12	N													0.071 J	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW04	12/3/12	N													0.095 U														
RW04	12/3/12	N2													0.094 UJ														
RW04	5/21/13	N													0.094 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW04	10/8/13	N													0.095 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW04	5/13/14	N													0.023 J														
RW04	9/25/14	N													0.015 U	0.060 U	0.24 U	0.23 U	0.22 U	0.43 U									
RW04	4/21/15	N													0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW04	10/15/15	N													0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW04	4/5/16	N													0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW05	5/4/04	N													0.0935 U	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U									
RW05	9/22/04	N													0.293	5.00 U	0.500 U	5.00 U	5.00 U	5.00 U									
RW05	11/1/04	N													0.0962 U														
RW05	5/10/05	N													0.11 U	0.93 U	0.50 U	5.0 U	5.0 U	5.0 U									
RW05	9/27/05	N													0.11 U	0.92 UJ	0.50 U	5.0 U	5.0 U	5.0 U									
RW05	5/31/06	N													0.11 UJ	0.94 U	0.50 U	5.0 U	5.0 U	5.0 U									
RW05	9/25/06	N													0.11 U	0.93 U	0.50 U	5.0 U	5.0 U	5.0 U									
RW05	5/9/07	N													0.092 UJ	0.93 R	1.0 U	1.0 U	1.0 U	2.0 U									
RW05	9/18/07	N													0.093 UJ	1.0 R	1.0 U	1.0 U	1.0 U	2.0 U									
RW05	5/20/08	N													0.095 UJ	0.95 U	1.0 UJ	1.0 U	1.0 U	2.0 UJ									

Appendix A.1

Historical Groundwater Analytical Data
Penta Wood Products Superfund Site
Siren, Wisconsin

Location	Date ²	Compound ¹ Units Type ³	Methane	Arsenic (dissolved)	Arsenic	Copper (dissolved)	Copper	Iron (dissolved)	Iron	Magnesium	Manganese (dissolved)	Manganese	Zinc (dissolved)	Zinc	Pentachlorophenol	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Alkalinity, hydroxide (as CaCO3)	Alkalinity, total (as CaCO3)	Chloride	Hardness, carbonate	Hardness	Nitrate (as N)	Sulfate	TOC averages	Total organic carbon (TOC)
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
RW05	10/23/08	N													1 U														
RW05	12/10/08	N													0.1 U		0.1 U	0.4 U	0.4 U	1.0 U									
RW05	6/2/09	N													0.1 UJ	1.0 UJ	0.5 U	2.0 U	2.0 U	5.0 U									
RW05	10/7/09	N													0.1 UJ	0.997 UJ	0.1 UJ	0.4 UJ	0.4 UJ	1 UJ									
RW05	5/19/10	N													0.1 U	1.0 U	0.4 U	5 U	5 U	5 U									
RW05	10/5/10	N													0.1 U	1.0 U	0.1 U	0.4 U	0.4 U	1 U									
RW05	6/30/11	N													0.1 U	0.991 U	0.1 U	0.4 U	0.4 U	1 U									
RW05	10/20/11	N													0.095 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW05	5/23/12	N													0.095 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW05	10/17/12	N													0.030 J	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW05	12/4/12	N													0.095 UJ														
RW05	12/4/12	N2													0.095 U														
RW05	5/21/13	N													0.095 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW05	10/8/13	N													0.098 U	0.19 U	0.50 U	1.0 U	1.0 U	2.0 U									
RW05	5/13/14	N													0.095 U														
RW05	9/25/14	N													0.015 U	0.060 U	0.24 U	0.23 U	0.22 U	0.43 U									
RW05	4/21/15	N													0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW05	10/15/15	N													0.016 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW05	4/5/16	N													0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW06	9/25/14	N													0.015 U	0.060 U	0.24 U	0.23 U	0.22 U	0.43 U									
RW06	4/21/15	N													0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW06	10/15/15	N													0.018 J	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
RW06	4/5/16	N													0.015 U	0.060 U	0.35 U	0.25 U	0.23 U	0.52 U									
EW11D	10/10/16	N	3.2	0.35 U		0.67 JB		793 B			23.6 B		6.2 U		8.4	0.060 U	0.28 U	0.26 U	0.23 U	0.24 U		190	13.6	272		2.7	159	1.0 B	

Appendix A.2

**Historical LNAPL Thickness - Monitoring Wells
Penta Wood Products Superfund Site
Siren, Wisconsin**

Date	Monitoring Well Thickness (feet)			LNAPL
	MW10S	MW18	MW19	MW20
Sep-01	0.01	0.27	0.51	0.11
May-02	0.00	0.29	0.23	0.00
Aug-02	0.00	0.33	0.22	0.00
May-03	0.00	0.00	0.00	0.00
Sep-03	0.00	0.32	0.24	0.04
May-04	0.00	0.45	0.36	0.35
Sep-04	0.21	0.54	0.67	0.52
May-05	0.29	0.48	0.63	0.36
Sep-05	0.87	0.06	0.83	1.15
May-06	0.00	0.00	0.29	0.00
Sep-06	0.00	0.05	0.80	0.69
Apr-07	0.58	0.04	0.74	1.22
May-07	0.58	0.03	0.54	1.20
Sep-07	0.04	0.16	1.07	0.00
May-08	0.40	1.19	0.90	1.71
Oct-08	0.14	0.04	0.00	0.00
Jun-09	0.54	1.58	1.60	1.45
Oct-09	0.63	1.92	1.46	1.02
May-10	0.51	2.01	1.10	0.85
Oct-10	0.00	0.57	0.59	0.00
Jun-11	0.00	0.42	0.79	0.00
Oct-11	0.00	0.53	1.07	0.00
May-12	0.69	0.79	0.80	2.17
Aug-12	0.04	0.43	0.89	0.30
Oct-12	0.00	0.45	0.91	0.88
Dec-12	0.02	0.44	1.06	0.95
May-13	0.17	0.53	0.94	1.08
Oct-13	0.00	0.70	1.25	0.81
May-14	0.00	0.79	0.22	0.22
Sep-14	0.00	0.56	0.30	0.00
2/13/15	0.00	0.56	0.24	0.00
2/20/15	0.00	0.53	0.23	0.00
3/24/15	0.00	0.34	0.52	0.00
4/16/15	0.00	0.58	NM	0.00
5/14/15	0.00	0.57	NM	0.00
10/12/15	0.00	0.42	0.07	0.01
4/4/16	0.00	0.66	0.25	0.01
7/18/16	0.00	0.52	0.00	0.00
7/18/16	0.00	0.67	0.01	0.01

Notes:

NM - Not Measured

Appendix A.3

**Historical Groundwater Extraction Summary
Penta Wood Products Superfund Site
Siren, Wisconsin**

Operation Period	Volume of Groundwater Extracted (gallons)
09/27/00 to 12/18/00	11,712,960
02/02/01 to 02/08/01	691,200
03/16/01 to 06/10/01	9,288,000
06/15/01 to 09/27/01	6,822,720
02/27/04 to 12/31/04	18,548,154
01/01/05 to 12/31/05	21,374,796
01/01/06 to 12/31/06	14,759,392
01/01/07 to 12/31/07	16,551,336
01/01/08 to 12/31/08	18,118,696
01/01/09 to 12/31/09	18,533,648
01/01/10 to 12/31/10	18,561,632
01/01/11 to 12/31/11	17,796,668
01/01/12 to 12/31/12	23,051,892
01/01/13 to 12/31/13	29,793,563
01/01/14 to 12/31/14	18,415,098
01/01/15 to 06/30/15	6,282,127
07/01/15 to 11/23/15	5,125,729
Total Gallons Extracted	255,427,611

Appendix A.4

**Historical Influent Pentachlorophenol Concentrations
Penta Wood Products Superfund Site
Siren, Wisconsin**

Date	Influent PCP Concentration (ug/L)
02/27/2004 to 12/31/2004*	9,227
01/01/2005 to 12/31/2005*	7,300
01/01/2006 to 12/31/2006*	6,425
01/01/2007 to 12/31/2007*	3,557
01/01/2008 to 12/31/2008*	3,255
March 2009	3,560
July 2009	3,140
September 2009	2,800
December 2009	2,030
March 2010	2050 J
June 2010	1,970
September 2010	1,830
December 2010	1,940
March 2011	2,470
June 2011	2,170
August 2011	1,700
October 2011	1,600
February 2012	2,600
May 2012	2,200
July 2012	1,900
October 2012	1,800
February 2013	1,100
May 2013	1,100
July 2013	1,800
October 2013	1,400
February 2014	1,800
May 2014	1,600
August 2014	2,100
September 2014	2,400
October 2014	2,400
November 2014	2,100
December 2014	4,600
January 2015	1,800
February 2015	480
March 2015	390
April 2015*	1,767
May 2015*	355
June 2015	550
July 2015*	1,100
August 2015	370
September 2015	750
October 2015	600
November 2015	1,100

Note:

* Average PCP influent concentration for that time period.

Appendix A.5

**Historical Hazardous Waste Generation Summary
Penta Wood Products Superfund Site
Siren, Wisconsin**

Date	Filter Cake (lb)	Misc. Debris (lb)	Carbon (lb)	LNAPL (lb)	Water (gallons)	Yearly Total (lb)
2000	0	200	6,000	5,009*	0	11,209
2001	0	400	56,100	6,166*	0	62,666
2002	0	1,400	48,000	10,790*	27,756	87,946
2003	0	600	0	3,083*	1,376	5,059
2004	155,960	3,200	102,000	53,522*	0	314,682
2005	178,784	1,290	104,860	23,847*	0	308,924
2006	112,640	1,200	136,520	52,892*	0	303,252
2007	174,020	2,200	245,377	77,615*	0	517,387
2008	211,402	3,176	70,007	28,036	0	312,621
2009	233,840	1,116	49,757	35,659	0	320,372
2010	210,940	0	81,227	34,937	0	327,104
2011	292,903	0	74,247	0	0	367,150
2012	182,280	0	65,420	25,493	0	273,193
2013	156,760	0	46,571	27,252	0	230,582
2014	110,754	13,513	65,995	11,720	0	201,982
2015	0	0	22,248	0	0	22,248
2016	0	15,212 [†]	34,877	14,374	0	49,251

Note:

* - Volume shows the amount of waste disposed offsite and is estimated to be approximately 50 percent pure LNAPL and 50 percent mixture of water and emulsified LNAPL.

† - Miscellaneous debris includes sludge, filter cake, and drill cuttings from system decommissioning.
lb - pounds

Appendix A.6

**LNAPL Thickness and Recovery Summary - Extraction Wells
Penta Wood Products Superfund Site
Siren, Wisconsin**

Well ID	Date	Depth to Water (feet) ¹	Depth to LNAPL (feet) ¹	LNAPL Thickness (feet)	Recovered LNAPL Volume (gallons)	Comments
EW02	2/18/2015	97.51	NP	0.00	NA	Groundwater extraction rate increased to 10 gpm
EW02	2/20/2015	97.52	NP	0.00	NA	
EW02	2/24/2015	97.59	NP	0.00	NA	
EW02	3/10/2015	97.67	NP	0.00	NA	
EW02	3/24/2015	97.76	NP	0.00	NA	
EW02	4/10/2015	97.79	NP	0.00	NA	
EW02	4/16/2015	97.76	NP	0.00	NA	
EW02	5/8/2015	97.77	NP	0.00	NA	Groundwater extraction rate increased to 12 gpm on 4/30/2015
EW02	5/21/2015	97.89	NP	0.00	NA	
EW02	6/3/2015	97.92	NP	0.00	NA	
EW02	6/16/2015	97.99	NP	0.00	NA	
EW02	7/8/2015	98.12	NP	0.00	NA	
EW02	7/21/2015	98.11	NP	0.00	NA	
EW02	7/29/2015	98.11	NP	0.00	NA	Groundwater extraction rate increased to 13.5 gpm
EW02	8/5/2015	98.18	NP	0.00	NA	
EW02	8/19/2015	98.11	NP	0.00	NA	
EW02	9/4/2015	97.83	NP	0.00	NA	
EW02	9/21/2015	97.76	NP	0.00	NA	
EW02	10/8/2015	97.72	NP	0.00	NA	
EW02	10/22/2015	97.64	NP	0.00	NA	
EW02	11/2/2015	97.58	NP	0.00	NA	
EW02	11/23/2015	NM	NM	NM	NA	Groundwater extraction pump turned off for pilot study
				Total LNAPL Recovered	0.0	

Appendix A.6

**LNAPL Thickness and Recovery Summary - Extraction Wells
Penta Wood Products Superfund Site
Siren, Wisconsin**

Well ID	Date	Depth to Water (feet) ¹	Depth to LNAPL (feet) ¹	LNAPL Thickness (feet)	Recovered LNAPL Volume (gallons)	Comments
EW04	11/4/2014	114.30	NP	0.00	NA	
EW04	12/11/2014	115.39	NP	0.00	NA	
EW04	12/23/2014	115.34	NP	0.00	NA	Groundwater extraction system shutdown pending carbon change-out
EW04	12/30/2014	115.26	NP	0.00	NA	Groundwater extraction system remained shutdown pending carbon change-out
EW04	1/8/2015	115.22	NP	0.00	NA	Groundwater extraction system remained shutdown pending carbon change-out
EW04	1/19/2015	115.23	NP	0.00	NA	Groundwater extraction system restarted after carbon change-out
EW04	1/22/2015	115.36	NP	0.00	NA	
EW04	1/30/2015	115.47	NP	0.00	NA	
EW04	2/3/2015	115.48	NP	0.00	NA	
EW04	2/13/2015	115.51	NP	0.00	NA	
EW04	2/17/2015	115.48	NP	0.00	NA	Groundwater extraction rate increased to 10 gpm
EW04	2/18/2015	115.51	NP	0.00	NA	
EW04	2/20/2015	115.43	NP	0.00	NA	
EW04	2/24/2015	115.53	NP	0.00	NA	
EW04	3/10/2015	115.58	NP	0.00	NA	
EW04	3/24/2015	115.67	NP	0.00	NA	
EW04	4/10/2015	115.69	NP	0.00	NA	
EW04	4/16/2015	115.69	NP	0.00	NA	
EW04	5/8/2015	115.69	NP	0.00	NA	Groundwater extraction rate increased to 12 gpm on 4/30/2015
EW04	5/21/2015	115.74	NP	0.00	NA	
EW04	6/3/2015	115.75	NP	0.00	NA	
EW04	6/16/2015	115.82	NP	0.00	NA	
EW04	7/8/2015	115.93	NP	0.00	NA	
EW04	7/21/2015	115.92	NP	0.00	NA	
EW04	7/29/2015	115.91	NP	0.00	NA	Groundwater extraction rate increased to 13.5 gpm
EW04	8/5/2015	115.97	NP	0.00	NA	
EW04	8/19/2015	115.95	NP	0.00	NA	
EW04	9/4/2015	115.78	NP	0.00	NA	
EW04	9/21/2015	115.61	NP	0.00	NA	
EW04	10/8/2015	115.58	NP	0.00	NA	
EW04	10/22/2015	115.58	NP	0.00	NA	
EW04	11/2/2015	115.45	NP	0.00	NA	
EW04	11/23/2015	NM	NM	NM	NA	Groundwater extraction pump turned off for pilot study
				Total LNAPL Recovered	0.0	

Appendix A.6

**LNAPL Thickness and Recovery Summary - Extraction Wells
Penta Wood Products Superfund Site
Siren, Wisconsin**

Well ID	Date	Depth to Water (feet) ¹	Depth to LNAPL (feet) ¹	LNAPL Thickness (feet)	Recovered LNAPL Volume (gallons)	Comments
EW05	11/4/2014	83.35	83.25	0.10	NA	
EW05	11/6/2014	NM	NM	NM	<0.1	
EW05	11/7/2014	91.51	91.44	0.07	NA	
EW05	11/11/2014	91.75	91.56	0.19	NA	
EW05	11/12/2014	91.65	91.48	0.17	NA	Temporary system shutdown due to alarm condition
EW05	11/17/2014	91.64	91.51	0.13	NA	
EW05	12/1/2014	91.58	91.46	0.12	NA	
EW05	12/8/2014	91.55	91.51	0.04	NA	
EW05	12/11/2014	91.65	91.52	0.13	NA	
EW05	12/23/2014	91.40	91.39	0.01	NA	Groundwater extraction system shutdown pending carbon change-out
EW05	12/30/2014	91.37	91.36	0.01	NA	Groundwater extraction system remained shutdown pending carbon change-out
EW05	1/8/2015	91.31	NP	0.00	NA	Groundwater extraction system remained shutdown pending carbon change-out
EW05	1/19/2015	91.32	NP	0.00	NA	Groundwater extraction system restarted after carbon change-out
EW05	1/22/2015	91.95	91.45	0.50	NA	
EW05	1/30/2015	92.00	91.49	0.51	0.1	Measurements recorded prior to LNAPL removal
EW05	2/3/2015	92.17	91.54	0.63	NA	
EW05	2/13/2015	92.14	91.54	0.60	NA	Groundwater extraction pump turned off
EW05	2/17/2015	91.72	91.49	0.23	NA	
EW05	2/20/2015	91.96	91.54	0.42	NA	
EW05	2/24/2015	91.91	91.56	0.35	NA	
EW05	2/27/2015	NM	NM	NM	0.3	Measurements recorded prior to LNAPL removal
EW05	3/10/2015	92.30	91.58	0.72	0.1	Measurements recorded prior to LNAPL removal
EW05	3/26/2015	92.42	91.62	0.80	NA	
EW05	3/31/2015	NM	NM	NM	0.5	
EW05	4/10/2015	92.50	91.71	0.79	NA	
EW05	4/16/2015	92.51	91.69	0.82	NA	
EW05	4/27/2015	NM	NM	NM	1.0	
EW05	5/8/2015	92.03	91.70	0.33	NA	
EW05	5/21/2015	92.34	91.76	0.58	1.0	
EW05	6/3/2015	92.29	91.79	0.50	0.4	
EW05	6/16/2015	92.40	91.86	0.54	0.3	
EW05	7/8/2015	92.34	91.95	0.39	NA	
EW05	7/10/2015	NM	NM	NM	0.5	
EW05	7/21/2015	92.58	91.93	0.65	NA	
EW05	7/23/2015	NM	NM	NM	0.5	
EW05	7/29/2015	92.69	91.96	0.73	NA	
EW05	8/5/2015	92.60	92.04	0.56	NA	
EW05	8/7/2015	NM	NM	NM	0.3	
EW05	8/19/2015	92.45	91.94	0.51	NA	
EW05	8/21/2015	NM	NM	NM	0.3	
EW05	9/4/2015	92.02	91.82	0.20	NA	
EW05	9/11/2015	NM	NM	NM	<0.1	
EW05	9/21/2015	91.67	91.66	0.01	NA	
EW05	10/8/2015	91.87	91.67	0.20	NA	
EW05	10/22/2015	91.66	91.65	0.01	NA	
EW05	11/2/2015	91.51	91.50	0.01	NA	
Total LNAPL Recovered					5.5	

Appendix A.6

**LNAPL Thickness and Recovery Summary - Extraction Wells
Penta Wood Products Superfund Site
Siren, Wisconsin**

Well ID	Date	Depth to Water (feet) ¹	Depth to LNAPL (feet) ¹	LNAPL Thickness (feet)	Recovered LNAPL Volume (gallons)	Comments
EW06	11/5/2014	111.22	98.06	13.16	12.0	
EW06	11/12/2014	107.80	98.30	9.50	NA	Temporary system shutdown due to alarm condition
EW06	11/17/2014	110.34	98.52	11.82	NA	
EW06	11/24/2014	111.05	98.45	12.60	10.0	
EW06	11/25/2014	105.63	98.55	7.08	NA	
EW06	12/1/2014	108.60	98.53	10.07	NA	
EW06	12/4/2014	109.35	98.48	10.87	NA	
EW06	12/8/2014	101.90	97.89	4.01	NA	
EW06	12/11/2014	111.91	98.01	13.90	NA	Measurements recorded prior to LNAPL removal
EW06	12/11/2014	100.35	98.40	1.95	12.0	Measurements recorded immediately after LNAPL removal
EW06	12/15/2014	108.40	98.01	10.39	NA	
EW06	12/23/2014	109.35	98.01	11.34	NA	Measurements recorded prior to LNAPL removal
EW06	12/23/2014	99.50	98.35	1.15	13.0	Measurements recorded immediately after LNAPL removal, groundwater extraction system shutdown pending carbon change-out
EW06	12/30/2014	98.59	97.83	0.76	NA	Groundwater extraction system remained shutdown pending carbon change-out
EW06	1/8/2015	99.00	97.92	1.08	NA	Groundwater extraction system remained shutdown pending carbon change-out
EW06	1/19/2015	99.54	97.80	1.74	NA	Groundwater extraction system restarted after carbon change-out
EW06	1/22/2015	111.10	98.18	12.92	NA	
EW06	1/23/2015	98.90	98.50	0.40	12.0	Measurements recorded immediately after LNAPL removal
EW06	1/30/2015	109.35	98.22	11.13	NA	
EW06	2/3/2015	112.61	98.22	14.39	12.0	Measurements recorded prior to LNAPL removal
EW06	2/13/2015	112.44	98.22	14.22	14.0	Groundwater extraction pump turned off
EW06	2/17/2015	101.95	98.12	3.83	NA	
EW06	2/20/2015	105.20	98.18	7.02	NA	
EW06	2/24/2015	105.37	98.02	7.35	8.0	Measurements recorded prior to LNAPL removal
EW06	3/10/2015	108.36	98.22	10.14	8.0	Measurements recorded prior to LNAPL removal
EW06	3/24/2015	NM	NM	NM	8.0	Not measured due to equipment breakdown
EW06	3/26/2015	105.87	98.21	7.66	NA	
EW06	4/10/2015	105.55	98.39	7.16	10.0	
EW06	4/16/2015	106.02	98.36	7.66	10.0	
EW06	4/30/2015	106.33	98.47	7.86	8.0	Groundwater extraction rate increased to 6 gpm
EW06	5/8/2015	100.72	98.32	2.40	4.0	
EW06	5/21/2015	106.84	98.27	8.57	10.0	
EW06	6/3/2015	106.55	98.41	8.14	NA	
EW06	6/4/2015	NM	NM	NM	10.0	
EW06	6/16/2015	105.85	98.49	7.36	7.0	
EW06	7/8/2015	107.10	98.42	8.68	20.0	
EW06	7/10/2015	107.10	98.60	8.50	17.0	
EW06	7/21/2015	107.90	98.54	9.36	17.0	
EW06	7/29/2015	105.87	98.59	7.28	NA	Groundwater extraction rate decreased to 3 gpm
EW06	8/5/2015	105.98	98.65	7.33	14.0	
EW06	8/7/2015	NM	NM	NM	14.0	
EW06	8/19/2015	103.95	98.51	5.44	10.0	
EW06	9/4/2015	105.31	98.31	7.00	10.0	
EW06	9/21/2015	104.49	98.28	6.21	10.0	
EW06	10/8/2015	100.38	98.25	2.13	5.0	
EW06	10/22/2015	105.54	98.23	7.31	8.0	
EW06	11/2/2015	105.15	98.05	7.10	NA	
EW06	11/5/2015	NM	NM	NM	8.0	
EW06	11/23/2015	NM	NM	NM	NA	Groundwater extraction pump turned off for pilot study
Total LNAPL Recovered					301.0	

Appendix A.6

**LNAPL Thickness and Recovery Summary - Extraction Wells
Penta Wood Products Superfund Site
Siren, Wisconsin**

Well ID	Date	Depth to Water (feet) ¹	Depth to LNAPL (feet) ¹	LNAPL Thickness (feet)	Recovered LNAPL Volume (gallons)	Comments
EW10	11/4/2014	108.20	103.92	4.28	NA	
EW10	11/5/2014	108.77	104.70	4.07	4.0	
EW10	11/18/2014	107.60	104.35	3.25	NA	
EW10	11/24/2014	107.45	103.94	3.51	0.0	LNAPL pump inoperable, unable to recover LNAPL
EW10	11/25/2014	107.50	103.91	3.59	NA	
EW10	12/1/2014	107.30	104.14	3.16	NA	
EW10	12/4/2014	107.33	104.11	3.22	NA	Measurements recorded prior to LNAPL removal
EW10	12/4/2014	105.35	104.05	1.30	2.0	Measurements recorded immediately after LNAPL removal
EW10	12/8/2014	104.29	103.17	1.12	NA	
EW10	12/11/2014	106.95	104.05	2.90	NA	Measurements recorded prior to LNAPL removal
EW10	12/11/2014	105.46	104.12	1.34	2.0	Measurements recorded immediately after LNAPL removal
EW10	12/15/2014	106.68	104.00	2.68	NA	
EW10	12/23/2014	107.25	103.91	3.34	NA	Measurements recorded prior to LNAPL removal
EW10	12/23/2014	104.75	104.06	0.69	4.0	Measurements recorded immediately after LNAPL removal, groundwater extraction system shutdown pending carbon change-out
EW10	12/30/2014	104.59	103.00	1.59	NA	Groundwater extraction system remained shutdown pending carbon change-out
EW10	1/8/2015	104.55	103.10	1.45	NA	Groundwater extraction system remained shutdown pending carbon change-out
EW10	1/19/2015	104.70	103.00	1.70	NA	Groundwater extraction system restarted after carbon change-out
EW10	1/22/2015	106.38	104.31	2.07	NA	
EW10	1/23/2015	104.40	104.38	0.02	2.0	Measurements recorded immediately after LNAPL removal
EW10	1/30/2015	105.76	104.28	1.48	NA	
EW10	2/3/2015	106.00	104.27	1.73	2.0	Measurements recorded prior to LNAPL removal
EW10	2/13/2015	106.82	104.24	2.58	3.0	Groundwater extraction pump turned off
EW10	2/17/2015	105.80	103.65	2.15	NA	
EW10	2/20/2015	106.40	103.81	2.59	NA	
EW10	2/24/2015	106.85	103.79	3.06	2.0	Measurements recorded prior to LNAPL removal
EW10	3/10/2015	107.80	103.81	3.99	2.0	Measurements recorded prior to LNAPL removal
EW10	3/24/2015	108.21	103.84	4.37	2.0	Measurements recorded prior to LNAPL removal
EW10	4/10/2015	108.96	103.86	5.10	3.0	
EW10	4/16/2015	108.18	103.90	4.28	2.0	
EW10	4/30/2015	107.81	103.84	3.97	2.0	
EW10	5/8/2015	106.84	103.46	3.38	2.5	
EW10	5/21/2015	107.46	103.62	3.84	2.5	
EW10	6/3/2015	107.51	103.60	3.91	NA	
EW10	6/4/2015	NM	NM	NM	2.5	
EW10	6/16/2015	108.20	103.85	4.35	2.0	
EW10	7/8/2015	108.53	103.96	4.57	3.0	
EW10	7/10/2015	107.85	103.97	3.88	NA	
EW10	7/21/2015	108.48	103.96	4.52	3.0	
EW10	7/29/2015	108.10	104.00	4.10	NA	
EW10	8/5/2015	108.85	104.00	4.85	2.5	
EW10	8/19/2015	108.57	103.74	4.83	3.0	
EW10	9/4/2015	108.91	103.60	5.31	3.0	
EW10	9/21/2015	108.35	103.62	4.73	3.0	
EW10	10/8/2015	107.72	103.33	4.39	2.5	
EW10	10/22/2015	109.10	103.56	5.54	3.0	
EW10	11/2/2015	109.50	103.27	6.23	NA	
EW10	11/5/2015	NM	NM	NM	3.0	
Total LNAPL Recovered					67.5	

Appendix A.6

**LNAPL Thickness and Recovery Summary - Extraction Wells
Penta Wood Products Superfund Site
Siren, Wisconsin**

Well ID	Date	Depth to Water (feet) ¹	Depth to LNAPL (feet) ¹	LNAPL Thickness (feet)	Recovered LNAPL Volume (gallons)	Comments
EW12	11/4/2014	105.26	105.04	0.22	NA	
EW12	11/6/2014	NM	NM	NM	<0.1	
EW12	11/7/2014	108.26	108.15	0.11	NA	
EW12	11/11/2014	108.39	108.22	0.17	NA	
EW12	11/12/2014	101.16	101.14	0.02	NA	Temporary system shutdown due to alarm condition
EW12	11/17/2014	108.00	107.98	0.02	NA	
EW12	12/8/2014	100.99	NP	0.00	NA	
EW12	12/11/2014	108.98	108.97	0.01	NA	
EW12	12/23/2014	109.75	NP	0.00	NA	Groundwater extraction system shutdown pending carbon change-out
EW12	12/30/2014	101.10	100.88	0.22	NA	Groundwater extraction system remained shutdown pending carbon change-out
EW12	1/8/2015	101.20	100.84	0.36	NA	Groundwater extraction system remained shutdown pending carbon change-out
EW12	1/19/2015	101.35	100.85	0.50	NA	Groundwater extraction system restarted after carbon change-out
EW12	1/22/2015	108.16	108.15	0.01	NA	
EW12	1/30/2015	108.96	108.96	0.00	NA	
EW12	2/3/2015	109.13	109.13	0.00	NA	
EW12	2/13/2015	109.98	NP	0.00	NA	Groundwater extraction pump turned off
EW12	2/17/2015	101.56	101.08	0.48	NA	
EW12	2/20/2015	101.90	101.32	0.58	NA	
EW12	2/24/2015	102.01	101.31	0.70	NA	
EW12	2/27/2015	NM	NM	NM	0.1	Measurements recorded prior to LNAPL removal
EW12	3/10/2015	102.35	101.35	1.00	0.1	Measurements recorded prior to LNAPL removal
EW12	3/24/2015	102.45	101.33	1.12	NA	
EW12	3/31/2015	NM	NM	NM	1.0	
EW12	4/10/2015	102.22	101.36	0.86	NA	
EW12	4/16/2015	102.32	101.36	0.96	NA	
EW12	4/27/2015	NM	NM	NM	1.0	
EW12	5/8/2015	101.99	101.19	0.80	NA	
EW12	5/21/2015	102.39	101.40	0.99	1.0	
EW12	6/3/2015	102.34	101.45	0.89	0.4	
EW12	6/16/2015	102.27	101.50	0.77	0.3	
EW12	7/8/2015	102.26	101.54	0.72	NA	
EW12	7/10/2015	NM	NM	NM	0.5	
EW12	7/21/2015	102.10	101.61	0.49	NA	
EW12	7/23/2015	NM	NM	NM	0.5	
EW12	7/29/2015	102.11	101.65	0.46	NA	
EW12	8/5/2015	102.39	101.69	0.70	NA	
EW12	8/7/2015	NM	NM	NM	0.3	
EW12	8/19/2015	101.27	100.45	0.82	NA	
EW12	8/21/2015	NM	NM	NM	0.1	
EW12	9/4/2015	101.87	101.47	0.40	NA	
EW12	9/11/2015	NM	NM	NM	0.3	
EW12	9/21/2015	101.60	101.29	0.31	NA	
EW12	10/1/2015	NM	NM	NM	0.2	
EW12	10/8/2015	101.39	101.15	0.24	NA	
EW12	10/22/2015	101.52	101.23	0.29	NA	
EW12	11/2/2015	101.51	101.18	0.33	NA	
Total LNAPL Recovered					5.9	

Appendix A.6

**LNAPL Thickness and Recovery Summary - Extraction Wells
Penta Wood Products Superfund Site
Siren, Wisconsin**

Well ID	Date	Depth to Water (feet) ¹	Depth to LNAPL (feet) ¹	LNAPL Thickness (feet)	Recovered LNAPL Volume (gallons)	Comments
EW13	11/4/2014	111.48	NP	0.00	NA	
EW13	12/11/2014	114.81	NP	0.00	NA	
EW13	12/23/2014	115.11	NP	0.00	NA	Groundwater extraction system shutdown pending carbon change-out
EW13	12/30/2014	107.34	NP	0.00	NA	Groundwater extraction system remained shutdown pending carbon change-out
EW13	1/8/2015	107.27	NP	0.00	NA	Groundwater extraction system remained shutdown pending carbon change-out
EW13	1/19/2015	107.33	NP	0.00	NA	Groundwater extraction system restarted after carbon change-out
EW13	1/22/2015	115.05	NP	0.00	NA	
EW13	1/30/2015	115.49	NP	0.00	NA	
EW13	2/3/2015	115.28	NP	0.00	NA	
EW13	2/13/2015	115.74	NP	0.00	NA	
EW13	2/17/2015	117.05	NP	0.00	NA	Groundwater extraction rate increased to 10 gpm
EW13	2/18/2015	119.19	NP	0.00	NA	
EW13	2/20/2015	119.37	NP	0.00	NA	
EW13	2/24/2015	119.50	NP	0.00	NA	
EW13	3/10/2015	120.13	NP	0.00	NA	
EW13	3/24/2015	116.72	NP	0.00	NA	
EW13	4/10/2015	118.55	NP	0.00	NA	
EW13	4/16/2015	120.92	NP	0.00	NA	
EW13	5/8/2015	107.18	NP	0.00	NA	Groundwater extraction pump turned off on 4/30/2015
EW13	5/21/2015	104.94	NP	0.00	NA	
EW13	6/3/2015	105.88	NP	0.00	NA	
EW13	6/16/2015	106.44	NP	0.00	NA	
EW13	7/8/2015	107.42	NP	0.00	NA	
EW13	7/21/2015	107.70	NP	0.00	NA	
EW13	7/29/2015	107.91	NP	0.00	NA	
EW13	8/5/2015	107.89	NP	0.00	NA	
EW13	8/19/2015	107.80	NP	0.00	NA	
EW13	9/4/2015	107.63	NP	0.00	NA	
EW13	9/21/2015	107.63	NP	0.00	NA	
EW13	10/8/2015	107.49	NP	0.00	NA	
EW13	10/22/2015	107.72	NP	0.00	NA	
EW13	11/2/2015	107.48	NP	0.00	NA	
				Total LNAPL Recovered	0.0	

Appendix A.6

**LNAPL Thickness and Recovery Summary - Extraction Wells
Penta Wood Products Superfund Site
Siren, Wisconsin**

Well ID	Date	Depth to Water (feet) ¹	Depth to LNAPL (feet) ¹	LNAPL Thickness (feet)	Recovered LNAPL Volume (gallons)	Comments
EW14	11/4/2014	112.55	112.45	0.10	NA	
EW14	11/6/2014	NM	NM	NM	<0.1	
EW14	11/7/2014	112.54	112.49	0.05	NA	
EW14	11/11/2014	112.68	112.60	0.08	NA	
EW14	11/12/2014	112.91	112.87	0.04	NA	Temporary system shutdown due to alarm condition
EW14	11/17/2014	111.82	111.55	0.27	NA	
EW14	12/8/2014	112.89	112.85	0.04	NA	
EW14	12/11/2014	113.83	113.75	0.08	NA	
EW14	12/23/2014	113.74	113.65	0.09	NA	Groundwater extraction system shutdown pending carbon change-out
EW14	12/30/2014	112.85	112.76	0.09	NA	Groundwater extraction system remained shutdown pending carbon change-out
EW14	1/8/2015	112.77	112.71	0.06	NA	Groundwater extraction system remained shutdown pending carbon change-out
EW14	1/19/2015	112.92	112.78	0.14	NA	Groundwater extraction system restarted after carbon change-out
EW14	1/22/2015	113.80	113.72	0.08	NA	
EW14	1/30/2015	113.79	113.66	0.13	<0.1	
EW14	2/3/2015	113.74	113.65	0.09	NA	
EW14	2/13/2015	113.90	113.68	0.22	NA	
EW14	2/17/2015	113.85	113.79	0.06	NA	Groundwater extraction rate increased to 10 gpm
EW14	2/18/2015	114.29	114.21	0.08	NA	
EW14	2/20/2015	114.26	114.18	0.08	NA	
EW14	2/24/2015	114.25	114.21	0.04	NA	
EW14	3/10/2015	114.36	114.30	0.06	NA	
EW14	3/24/2015	114.41	114.36	0.05	NA	
EW14	3/31/2015	NM	NM	NM	<0.1	
EW14	4/10/2015	114.43	114.42	0.01	NA	
EW14	4/16/2015	114.47	114.44	0.03	NA	
EW14	5/8/2015	113.30	113.14	0.16	NA	Groundwater extraction pump turned off on 4/30/2015
EW14	5/21/2015	113.71	113.49	0.22	NA	
EW14	6/3/2015	113.72	113.50	0.22	0.2	
EW14	6/16/2015	113.71	113.58	0.13	0.1	
EW14	7/8/2015	113.71	113.62	0.09	NA	
EW14	7/21/2015	113.78	113.68	0.10	NA	
EW14	7/29/2015	113.83	113.72	0.11	NA	
EW14	8/5/2015	113.84	113.72	0.12	NA	
EW14	8/7/2015	NM	NM	NM	<0.1	
EW14	8/19/2015	113.80	113.70	0.10	NA	
EW14	9/4/2015	113.68	113.59	0.09	NA	
EW14	9/11/2015	NM	NM	NM	<0.1	
EW14	9/21/2015	113.43	113.38	0.05	NA	
EW14	10/8/2015	113.12	113.06	0.06	NA	
EW14	10/22/2015	113.48	113.39	0.09	NA	
EW14	11/2/2015	113.44	113.32	0.12	NA	
Total LNAPL Recovered					0.8	
Total LNAPL Recovered (all wells)					380.7	Since system modification in October 2014; system shutdown and LNAPL recovery terminated in November 2015

Notes:

¹ Depth to water and depth to LNAPL measurements before December 2014 were not consistently recorded from the same benchmark location/elevation. Measurements were consistently recorded from the same benchmark location at the top of the well vault starting in December 2014.

NM - Not measured
 NP - LNAPL was not present in a measurable quantity
 NA - Not applicable

Appendix B

Groundwater Sample Laboratory Reports

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Canton

4101 Shuffel Street NW

North Canton, OH 44720

Tel: (330)497-9396

TestAmerica Job ID: 240-70706-1

Client Project/Site: 86165-03-11, Penta Wood

For:

GHD Services Inc.

1801 Old Highway 8 NW

Suite 114

St. Paul, Minnesota 55112

Attn: Mr. Grant Anderson



Authorized for release by:

10/25/2016 3:37:45 PM

Denise Heckler, Project Manager II

(330)966-9477

denise.heckler@testamericainc.com

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

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

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Definitions/Glossary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
D	Surrogate or matrix spike recoveries were not obtained because the extract was diluted for analysis; also compounds analyzed at a dilution may be flagged with a D.
X	Surrogate is outside control limits

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Reported value was between the limit of detection and the limit of quantitation.

General Chemistry

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
F1	MS and/or MSD Recovery is outside acceptance limits.
H	Sample was prepped or analyzed beyond the specified holding time
J	Reported value was between the limit of detection and the limit of quantitation.
F2	MS/MSD RPD exceeds control limits

Glossary

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

Case Narrative

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Job ID: 240-70706-1

Laboratory: TestAmerica Canton

Narrative

Job Narrative 240-70706-1

Comments

Per GHD via email on October 13, 2016: Sample -01 is a rinse blank and should only be analyzed for: Metals, PCP, BTEX and Naphthalene.

Receipt

The samples were received on 10/12/2016 9:20 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 9 coolers at receipt time were 0.6° C, 1.0° C, 1.2° C, 1.4° C, 1.8° C, 2.4° C, 2.6° C, 3.6° C and 4.6° C.

Receipt Exceptions

Method(s) 9060: Two containers for the following sample was received empty: W-161010-PS-01 (240-70706-1).

The following sample was listed on the Chain of Custody (COC); however, no sample was received: Trip Blank 001 (240-70706-11).

GC/MS VOA

Method(s) 8260B: The reporting limit (RL) provided for the following analyte (Benzene) falls below the laboratory's verified standard quantitation limit: Results reported below the verified standard quantitation limit have less certainty (i.e., are estimated) and must be used at the client's discretion. The continuing calibration blanks and method blanks may not support the lower RL.

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

GC/MS Semi VOA

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

GC VOA

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

GC Semi VOA

Method(s) 8151A: The following sample was diluted due to the abundance of target analytes: W-161010-PS-03 (240-70706-3)

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

Metals

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

General Chemistry

Method(s) 300.0: The following sample were analyzed outside of analytical holding time due to instrument failure: W-161010-PS-02 (240-70706-2), W-161010-PS-02 (240-70706-2[MSJ]), W-161010-PS-02 (240-70706-2[MSD]) and W-161010-PS-05 (240-70706-5).

Method(s) 300.0: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for analytical batch 240-251049 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

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

Organic Prep

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

VOA Prep

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

Method Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8270C	Semivolatile Organic Compounds (GC/MS)	SW846	TAL CAN
RSK-175	Dissolved Gases (GC)	RSK	TAL CAN
8151A	Herbicides (GC)	SW846	TAL PIT
6020	Metals (ICP/MS)	SW846	TAL CAN
2320B-1997	Alkalinity, Total	SM	TAL CAN
2340C-1997	Hardness, Total	SM	TAL CAN
300.0	Anions, Ion Chromatography	MCAWW	TAL CAN
9060	Organic Carbon, Total (TOC)	SW846	TAL CAN

Protocol References:

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

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

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

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

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-70706-1	W-161010-PS-01	Water	10/10/16 10:30	10/12/16 09:20
240-70706-2	W-161010-PS-02	Water	10/10/16 12:40	10/12/16 09:20
240-70706-3	W-161010-PS-03	Water	10/10/16 14:05	10/12/16 09:20
240-70706-4	W-161010-PS-04	Water	10/10/16 14:45	10/12/16 09:20
240-70706-5	W-161010-PS-05	Water	10/10/16 15:55	10/12/16 09:20
240-70706-6	W-161010-PS-06	Water	10/10/16 16:00	10/12/16 09:20
240-70706-7	W-161011-PS-07	Water	10/11/16 09:35	10/12/16 09:20
240-70706-8	W-161011-PS-08	Water	10/11/16 10:25	10/12/16 09:20
240-70706-9	W-161011-PS-09	Water	10/11/16 11:20	10/12/16 09:20
240-70706-10	W-161011-PS-10	Water	10/11/16 12:15	10/12/16 09:20



Detection Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Client Sample ID: W-161010-PS-01

Lab Sample ID: 240-70706-1

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Copper	0.71	J B	2.0	0.36	ug/L	1		6020	Dissolved
Iron	10.1	J B	100	5.3	ug/L	1		6020	Dissolved
Manganese	0.45	J B	5.0	0.25	ug/L	1		6020	Dissolved

Client Sample ID: W-161010-PS-02

Lab Sample ID: 240-70706-2

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Pentachlorophenol	0.37		0.094	0.015	ug/L	4		8151A	Total/NA
Arsenic	0.87	J	5.0	0.35	ug/L	1		6020	Dissolved
Copper	2.3	B	2.0	0.36	ug/L	1		6020	Dissolved
Iron	23.2	J B	100	5.3	ug/L	1		6020	Dissolved
Manganese	0.94	J B	5.0	0.25	ug/L	1		6020	Dissolved
Alkalinity	49.3		5.0	1.9	mg/L	1		2320B-1997	Total/NA
Hardness as calcium carbonate	56.0		5.0	3.1	mg/L	1		2340C-1997	Total/NA
Chloride	0.98	J	1.0	0.41	mg/L	1		300.0	Total/NA
Nitrate as N	0.58	H F1	0.10	0.035	mg/L	1		300.0	Total/NA
Sulfate	3.1	F1	1.0	0.13	mg/L	1		300.0	Total/NA
Total Organic Carbon	1.9	B	1.0	0.080	mg/L	1		9060	Total/NA

Client Sample ID: W-161010-PS-03

Lab Sample ID: 240-70706-3

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Methane	3.2		0.50	0.080	ug/L	1		RSK-175	Total/NA
Pentachlorophenol	8.4		1.2	0.18	ug/L	50		8151A	Total/NA
Copper	0.67	J B	2.0	0.36	ug/L	1		6020	Dissolved
Iron	793	B	100	5.3	ug/L	1		6020	Dissolved
Manganese	23.6	B	5.0	0.25	ug/L	1		6020	Dissolved
Alkalinity	190		5.0	1.9	mg/L	1		2320B-1997	Total/NA
Hardness as calcium carbonate	272		5.0	3.1	mg/L	1		2340C-1997	Total/NA
Chloride	13.6		1.0	0.41	mg/L	1		300.0	Total/NA
Nitrate as N	2.7		0.10	0.035	mg/L	1		300.0	Total/NA
Sulfate	159		1.0	0.13	mg/L	1		300.0	Total/NA
Total Organic Carbon	1.0	B	1.0	0.080	mg/L	1		9060	Total/NA

Client Sample ID: W-161010-PS-04

Lab Sample ID: 240-70706-4

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Pentachlorophenol	0.70		0.094	0.015	ug/L	4		8151A	Total/NA
Arsenic	0.40	J	5.0	0.35	ug/L	1		6020	Dissolved
Copper	3.0	B	2.0	0.36	ug/L	1		6020	Dissolved
Iron	114	B	100	5.3	ug/L	1		6020	Dissolved
Manganese	97.9	B	5.0	0.25	ug/L	1		6020	Dissolved
Alkalinity	64.7		5.0	1.9	mg/L	1		2320B-1997	Total/NA
Hardness as calcium carbonate	118		5.0	3.1	mg/L	1		2340C-1997	Total/NA
Chloride	7.9		1.0	0.41	mg/L	1		300.0	Total/NA
Nitrate as N	7.9		0.10	0.035	mg/L	1		300.0	Total/NA
Sulfate	39.1		1.0	0.13	mg/L	1		300.0	Total/NA
Total Organic Carbon	4.7	B	1.0	0.080	mg/L	1		9060	Total/NA

Client Sample ID: W-161010-PS-05

Lab Sample ID: 240-70706-5

This Detection Summary does not include radiochemical test results.

TestAmerica Canton

Detection Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Client Sample ID: W-161010-PS-05 (Continued)

Lab Sample ID: 240-70706-5

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Pentachlorophenol	0.23		0.096	0.015	ug/L	4		8151A	Total/NA
Copper	0.62	J B	2.0	0.36	ug/L	1		6020	Dissolved
Iron	5.4	J B	100	5.3	ug/L	1		6020	Dissolved
Manganese	0.46	J B	5.0	0.25	ug/L	1		6020	Dissolved
Alkalinity	31.1		5.0	1.9	mg/L	1		2320B-1997	Total/NA
Hardness as calcium carbonate	52.0		5.0	3.1	mg/L	1		2340C-1997	Total/NA
Chloride	17.5		1.0	0.41	mg/L	1		300.0	Total/NA
Nitrate as N	1.6	H	0.10	0.035	mg/L	1		300.0	Total/NA
Sulfate	2.8		1.0	0.13	mg/L	1		300.0	Total/NA
Total Organic Carbon	0.44	J B	1.0	0.080	mg/L	1		9060	Total/NA

Client Sample ID: W-161010-PS-06

Lab Sample ID: 240-70706-6

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Pentachlorophenol	0.17		0.097	0.015	ug/L	4		8151A	Total/NA
Copper	0.71	J B	2.0	0.36	ug/L	1		6020	Dissolved
Manganese	0.27	J B	5.0	0.25	ug/L	1		6020	Dissolved
Alkalinity	31.1		5.0	1.9	mg/L	1		2320B-1997	Total/NA
Hardness as calcium carbonate	54.0		5.0	3.1	mg/L	1		2340C-1997	Total/NA
Chloride	16.9		1.0	0.41	mg/L	1		300.0	Total/NA
Nitrate as N	1.6		0.10	0.035	mg/L	1		300.0	Total/NA
Sulfate	2.7		1.0	0.13	mg/L	1		300.0	Total/NA
Total Organic Carbon	0.44	J B	1.0	0.080	mg/L	1		9060	Total/NA

Client Sample ID: W-161011-PS-07

Lab Sample ID: 240-70706-7

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.71	J	5.0	0.35	ug/L	1		6020	Dissolved
Copper	0.90	J B	2.0	0.36	ug/L	1		6020	Dissolved
Manganese	0.38	J B	5.0	0.25	ug/L	1		6020	Dissolved
Alkalinity	194		5.0	1.9	mg/L	1		2320B-1997	Total/NA
Hardness as calcium carbonate	230		5.0	3.1	mg/L	1		2340C-1997	Total/NA
Chloride	32.3		1.0	0.41	mg/L	1		300.0	Total/NA
Nitrate as N	1.9		0.10	0.035	mg/L	1		300.0	Total/NA
Sulfate	8.1		1.0	0.13	mg/L	1		300.0	Total/NA
Total Organic Carbon	0.54	J B	1.0	0.080	mg/L	1		9060	Total/NA

Client Sample ID: W-161011-PS-08

Lab Sample ID: 240-70706-8

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.80	J	5.0	0.35	ug/L	1		6020	Dissolved
Copper	0.76	J B	2.0	0.36	ug/L	1		6020	Dissolved
Manganese	0.28	J B	5.0	0.25	ug/L	1		6020	Dissolved
Alkalinity	208		5.0	1.9	mg/L	1		2320B-1997	Total/NA
Hardness as calcium carbonate	348		5.0	3.1	mg/L	1		2340C-1997	Total/NA
Chloride	17.0		1.0	0.41	mg/L	1		300.0	Total/NA
Nitrate as N	2.7		0.10	0.035	mg/L	1		300.0	Total/NA
Sulfate	136		1.0	0.13	mg/L	1		300.0	Total/NA
Total Organic Carbon	0.36	J B	1.0	0.080	mg/L	1		9060	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Canton

Detection Summary

Client: GHD Services Inc.
 Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Client Sample ID: W-161011-PS-09

Lab Sample ID: 240-70706-9

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Pentachlorophenol	5.7		0.095	0.015	ug/L	4		8151A	Total/NA
Arsenic	0.38	J	5.0	0.35	ug/L	1		6020	Dissolved
Copper	1.8	J B	2.0	0.36	ug/L	1		6020	Dissolved
Iron	6.2	J B	100	5.3	ug/L	1		6020	Dissolved
Manganese	0.44	J B	5.0	0.25	ug/L	1		6020	Dissolved
Alkalinity	30.5		5.0	1.9	mg/L	1		2320B-1997	Total/NA
Hardness as calcium carbonate	82.0		5.0	3.1	mg/L	1		2340C-1997	Total/NA
Chloride	74.4		1.0	0.41	mg/L	1		300.0	Total/NA
Nitrate as N	1.8		0.10	0.035	mg/L	1		300.0	Total/NA
Sulfate	6.6		1.0	0.13	mg/L	1		300.0	Total/NA
Total Organic Carbon	0.61	J B	1.0	0.080	mg/L	1		9060	Total/NA

Client Sample ID: W-161011-PS-10

Lab Sample ID: 240-70706-10

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Methane	1.5		0.50	0.080	ug/L	1		RSK-175	Total/NA
Pentachlorophenol	0.45		0.094	0.015	ug/L	4		8151A	Total/NA
Copper	1.7	J B	2.0	0.36	ug/L	1		6020	Dissolved
Iron	171	B	100	5.3	ug/L	1		6020	Dissolved
Manganese	14.8	B	5.0	0.25	ug/L	1		6020	Dissolved
Alkalinity	233		5.0	1.9	mg/L	1		2320B-1997	Total/NA
Hardness as calcium carbonate	268		5.0	3.1	mg/L	1		2340C-1997	Total/NA
Chloride	46.8		1.0	0.41	mg/L	1		300.0	Total/NA
Nitrate as N	1.8		0.10	0.035	mg/L	1		300.0	Total/NA
Sulfate	12.7		1.0	0.13	mg/L	1		300.0	Total/NA
Total Organic Carbon	1.1	B	1.0	0.080	mg/L	1		9060	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Canton

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Client Sample ID: W-161010-PS-01

Lab Sample ID: 240-70706-1

Date Collected: 10/10/16 10:30

Matrix: Water

Date Received: 10/12/16 09:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/18/16 17:42	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/18/16 17:42	1
Toluene	<0.23		1.0	0.23	ug/L			10/18/16 17:42	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/18/16 17:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	123		63 - 132		10/18/16 17:42	1
4-Bromofluorobenzene (Surr)	96		73 - 120		10/18/16 17:42	1
Toluene-d8 (Surr)	101		73 - 124		10/18/16 17:42	1
Dibromofluoromethane (Surr)	99		80 - 120		10/18/16 17:42	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.060		0.19	0.060	ug/L		10/17/16 08:33	10/18/16 19:32	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	59		42 - 120	10/17/16 08:33	10/18/16 19:32	1
2-Fluorophenol (Surr)	27		10 - 120	10/17/16 08:33	10/18/16 19:32	1
2,4,6-Tribromophenol (Surr)	56		35 - 125	10/17/16 08:33	10/18/16 19:32	1
Nitrobenzene-d5 (Surr)	65		36 - 120	10/17/16 08:33	10/18/16 19:32	1
Phenol-d5 (Surr)	15		10 - 120	10/17/16 08:33	10/18/16 19:32	1
Terphenyl-d14 (Surr)	64		17 - 120	10/17/16 08:33	10/18/16 19:32	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.015		0.097	0.015	ug/L		10/15/16 10:30	10/21/16 12:53	4

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	41		18 - 125	10/15/16 10:30	10/21/16 12:53	4

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.35		5.0	0.35	ug/L		10/13/16 14:00	10/21/16 00:30	1
Copper	0.71	J B	2.0	0.36	ug/L		10/13/16 14:00	10/21/16 00:30	1
Iron	10.1	J B	100	5.3	ug/L		10/13/16 14:00	10/21/16 00:30	1
Manganese	0.45	J B	5.0	0.25	ug/L		10/13/16 14:00	10/21/16 00:30	1
Zinc	<6.2		20.0	6.2	ug/L		10/13/16 14:00	10/21/16 00:30	1

TestAmerica Canton

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Client Sample ID: W-161010-PS-02

Lab Sample ID: 240-70706-2

Date Collected: 10/10/16 12:40

Matrix: Water

Date Received: 10/12/16 09:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/19/16 00:38	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/19/16 00:38	1
Toluene	<0.23		1.0	0.23	ug/L			10/19/16 00:38	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/19/16 00:38	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	125		63 - 132		10/19/16 00:38	1
4-Bromofluorobenzene (Surr)	103		73 - 120		10/19/16 00:38	1
Toluene-d8 (Surr)	113		73 - 124		10/19/16 00:38	1
Dibromofluoromethane (Surr)	114		80 - 120		10/19/16 00:38	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.060		0.19	0.060	ug/L		10/17/16 12:43	10/20/16 11:29	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	63		42 - 120	10/17/16 12:43	10/20/16 11:29	1
2-Fluorophenol (Surr)	30		10 - 120	10/17/16 12:43	10/20/16 11:29	1
2,4,6-Tribromophenol (Surr)	70		35 - 125	10/17/16 12:43	10/20/16 11:29	1
Nitrobenzene-d5 (Surr)	60		36 - 120	10/17/16 12:43	10/20/16 11:29	1
Phenol-d5 (Surr)	17		10 - 120	10/17/16 12:43	10/20/16 11:29	1
Terphenyl-d14 (Surr)	61		17 - 120	10/17/16 12:43	10/20/16 11:29	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.080		0.50	0.080	ug/L			10/23/16 16:51	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	88		76 - 121		10/23/16 16:51	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	0.37		0.094	0.015	ug/L		10/15/16 10:30	10/21/16 13:17	4

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	64		18 - 125	10/15/16 10:30	10/21/16 13:17	4

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.87	J	5.0	0.35	ug/L		10/13/16 14:00	10/20/16 23:52	1
Copper	2.3	B	2.0	0.36	ug/L		10/13/16 14:00	10/20/16 23:52	1
Iron	23.2	J B	100	5.3	ug/L		10/13/16 14:00	10/20/16 23:52	1
Manganese	0.94	J B	5.0	0.25	ug/L		10/13/16 14:00	10/20/16 23:52	1
Zinc	<6.2		20.0	6.2	ug/L		10/13/16 14:00	10/20/16 23:52	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	49.3		5.0	1.9	mg/L			10/18/16 17:50	1
Hardness as calcium carbonate	56.0		5.0	3.1	mg/L			10/14/16 08:07	1
Chloride	0.98	J	1.0	0.41	mg/L			10/16/16 01:20	1
Nitrate as N	0.58	H F1	0.10	0.035	mg/L			10/12/16 14:01	1

TestAmerica Canton

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Client Sample ID: W-161010-PS-02

Lab Sample ID: 240-70706-2

Date Collected: 10/10/16 12:40

Matrix: Water

Date Received: 10/12/16 09:20

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	3.1	F1	1.0	0.13	mg/L			10/12/16 14:01	1
Total Organic Carbon	1.9	B	1.0	0.080	mg/L			10/13/16 20:25	1

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Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Client Sample ID: W-161010-PS-03

Lab Sample ID: 240-70706-3

Date Collected: 10/10/16 14:05

Matrix: Water

Date Received: 10/12/16 09:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/18/16 18:04	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/18/16 18:04	1
Toluene	<0.23		1.0	0.23	ug/L			10/18/16 18:04	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/18/16 18:04	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	121		63 - 132		10/18/16 18:04	1
4-Bromofluorobenzene (Surr)	93		73 - 120		10/18/16 18:04	1
Toluene-d8 (Surr)	106		73 - 124		10/18/16 18:04	1
Dibromofluoromethane (Surr)	100		80 - 120		10/18/16 18:04	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.060		0.19	0.060	ug/L		10/17/16 08:33	10/20/16 11:38	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	69		42 - 120	10/17/16 08:33	10/20/16 11:38	1
2-Fluorophenol (Surr)	34		10 - 120	10/17/16 08:33	10/20/16 11:38	1
2,4,6-Tribromophenol (Surr)	61		35 - 125	10/17/16 08:33	10/20/16 11:38	1
Nitrobenzene-d5 (Surr)	71		36 - 120	10/17/16 08:33	10/20/16 11:38	1
Phenol-d5 (Surr)	19		10 - 120	10/17/16 08:33	10/20/16 11:38	1
Terphenyl-d14 (Surr)	62		17 - 120	10/17/16 08:33	10/20/16 11:38	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	3.2		0.50	0.080	ug/L			10/23/16 17:43	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	84		76 - 121		10/23/16 17:43	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	8.4		1.2	0.18	ug/L		10/15/16 10:30	10/24/16 12:02	50

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	0	X D	18 - 125	10/15/16 10:30	10/24/16 12:02	50

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.35		5.0	0.35	ug/L		10/13/16 14:00	10/21/16 00:35	1
Copper	0.67	J B	2.0	0.36	ug/L		10/13/16 14:00	10/21/16 00:35	1
Iron	793	B	100	5.3	ug/L		10/13/16 14:00	10/21/16 00:35	1
Manganese	23.6	B	5.0	0.25	ug/L		10/13/16 14:00	10/21/16 00:35	1
Zinc	<6.2		20.0	6.2	ug/L		10/13/16 14:00	10/21/16 00:35	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	190		5.0	1.9	mg/L			10/18/16 18:41	1
Hardness as calcium carbonate	272		5.0	3.1	mg/L			10/14/16 08:40	1
Chloride	13.6		1.0	0.41	mg/L			10/12/16 13:00	1
Nitrate as N	2.7		0.10	0.035	mg/L			10/12/16 13:00	1

TestAmerica Canton

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Client Sample ID: W-161010-PS-03

Lab Sample ID: 240-70706-3

Date Collected: 10/10/16 14:05

Matrix: Water

Date Received: 10/12/16 09:20

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	159		1.0	0.13	mg/L			10/12/16 13:00	1
Total Organic Carbon	1.0	B	1.0	0.080	mg/L			10/13/16 22:52	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Client Sample ID: W-161010-PS-04

Lab Sample ID: 240-70706-4

Date Collected: 10/10/16 14:45

Matrix: Water

Date Received: 10/12/16 09:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/18/16 18:26	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/18/16 18:26	1
Toluene	<0.23		1.0	0.23	ug/L			10/18/16 18:26	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/18/16 18:26	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	121		63 - 132		10/18/16 18:26	1
4-Bromofluorobenzene (Surr)	97		73 - 120		10/18/16 18:26	1
Toluene-d8 (Surr)	106		73 - 124		10/18/16 18:26	1
Dibromofluoromethane (Surr)	103		80 - 120		10/18/16 18:26	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.060		0.19	0.060	ug/L		10/17/16 08:33	10/18/16 13:17	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	80		42 - 120	10/17/16 08:33	10/18/16 13:17	1
2-Fluorophenol (Surr)	30		10 - 120	10/17/16 08:33	10/18/16 13:17	1
2,4,6-Tribromophenol (Surr)	58		35 - 125	10/17/16 08:33	10/18/16 13:17	1
Nitrobenzene-d5 (Surr)	83		36 - 120	10/17/16 08:33	10/18/16 13:17	1
Phenol-d5 (Surr)	17		10 - 120	10/17/16 08:33	10/18/16 13:17	1
Terphenyl-d14 (Surr)	76		17 - 120	10/17/16 08:33	10/18/16 13:17	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.080		0.50	0.080	ug/L			10/23/16 18:00	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	85		76 - 121		10/23/16 18:00	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	0.70		0.094	0.015	ug/L		10/15/16 10:30	10/24/16 12:49	4

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	68		18 - 125	10/15/16 10:30	10/24/16 12:49	4

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.40	J	5.0	0.35	ug/L		10/13/16 14:00	10/21/16 00:39	1
Copper	3.0	B	2.0	0.36	ug/L		10/13/16 14:00	10/21/16 00:39	1
Iron	114	B	100	5.3	ug/L		10/13/16 14:00	10/21/16 00:39	1
Manganese	97.9	B	5.0	0.25	ug/L		10/13/16 14:00	10/21/16 00:39	1
Zinc	<6.2		20.0	6.2	ug/L		10/13/16 14:00	10/21/16 00:39	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	64.7		5.0	1.9	mg/L			10/18/16 19:13	1
Hardness as calcium carbonate	118		5.0	3.1	mg/L			10/14/16 08:42	1
Chloride	7.9		1.0	0.41	mg/L			10/12/16 13:20	1
Nitrate as N	7.9		0.10	0.035	mg/L			10/12/16 13:20	1

TestAmerica Canton

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Client Sample ID: W-161010-PS-04

Lab Sample ID: 240-70706-4

Date Collected: 10/10/16 14:45

Matrix: Water

Date Received: 10/12/16 09:20

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	39.1		1.0	0.13	mg/L			10/12/16 13:20	1
Total Organic Carbon	4.7	B	1.0	0.080	mg/L			10/13/16 23:19	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Client Sample ID: W-161010-PS-05

Lab Sample ID: 240-70706-5

Date Collected: 10/10/16 15:55

Matrix: Water

Date Received: 10/12/16 09:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/18/16 18:47	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/18/16 18:47	1
Toluene	<0.23		1.0	0.23	ug/L			10/18/16 18:47	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/18/16 18:47	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	126		63 - 132		10/18/16 18:47	1
4-Bromofluorobenzene (Surr)	92		73 - 120		10/18/16 18:47	1
Toluene-d8 (Surr)	104		73 - 124		10/18/16 18:47	1
Dibromofluoromethane (Surr)	102		80 - 120		10/18/16 18:47	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.062		0.20	0.062	ug/L		10/17/16 08:33	10/18/16 13:40	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	83		42 - 120	10/17/16 08:33	10/18/16 13:40	1
2-Fluorophenol (Surr)	39		10 - 120	10/17/16 08:33	10/18/16 13:40	1
2,4,6-Tribromophenol (Surr)	73		35 - 125	10/17/16 08:33	10/18/16 13:40	1
Nitrobenzene-d5 (Surr)	81		36 - 120	10/17/16 08:33	10/18/16 13:40	1
Phenol-d5 (Surr)	21		10 - 120	10/17/16 08:33	10/18/16 13:40	1
Terphenyl-d14 (Surr)	79		17 - 120	10/17/16 08:33	10/18/16 13:40	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.080		0.50	0.080	ug/L			10/23/16 18:17	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	82		76 - 121		10/23/16 18:17	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	0.23		0.096	0.015	ug/L		10/15/16 10:30	10/21/16 15:17	4

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	59		18 - 125	10/15/16 10:30	10/21/16 15:17	4

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.35		5.0	0.35	ug/L		10/13/16 14:00	10/21/16 00:43	1
Copper	0.62	J B	2.0	0.36	ug/L		10/13/16 14:00	10/21/16 00:43	1
Iron	5.4	J B	100	5.3	ug/L		10/13/16 14:00	10/21/16 00:43	1
Manganese	0.46	J B	5.0	0.25	ug/L		10/13/16 14:00	10/21/16 00:43	1
Zinc	<6.2		20.0	6.2	ug/L		10/13/16 14:00	10/21/16 00:43	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	31.1		5.0	1.9	mg/L			10/18/16 19:29	1
Hardness as calcium carbonate	52.0		5.0	3.1	mg/L			10/14/16 08:45	1
Chloride	17.5		1.0	0.41	mg/L			10/12/16 16:02	1
Nitrate as N	1.6	H	0.10	0.035	mg/L			10/12/16 16:02	1

TestAmerica Canton

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Client Sample ID: W-161010-PS-05

Lab Sample ID: 240-70706-5

Date Collected: 10/10/16 15:55

Matrix: Water

Date Received: 10/12/16 09:20

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	2.8		1.0	0.13	mg/L			10/12/16 16:02	1
Total Organic Carbon	0.44	J B	1.0	0.080	mg/L			10/13/16 23:46	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Client Sample ID: W-161010-PS-06

Lab Sample ID: 240-70706-6

Date Collected: 10/10/16 16:00

Matrix: Water

Date Received: 10/12/16 09:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/18/16 19:09	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/18/16 19:09	1
Toluene	<0.23		1.0	0.23	ug/L			10/18/16 19:09	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/18/16 19:09	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	122		63 - 132		10/18/16 19:09	1
4-Bromofluorobenzene (Surr)	99		73 - 120		10/18/16 19:09	1
Toluene-d8 (Surr)	104		73 - 124		10/18/16 19:09	1
Dibromofluoromethane (Surr)	106		80 - 120		10/18/16 19:09	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.066		0.21	0.066	ug/L		10/17/16 08:33	10/18/16 14:04	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	63		42 - 120	10/17/16 08:33	10/18/16 14:04	1
2-Fluorophenol (Surr)	25		10 - 120	10/17/16 08:33	10/18/16 14:04	1
2,4,6-Tribromophenol (Surr)	62		35 - 125	10/17/16 08:33	10/18/16 14:04	1
Nitrobenzene-d5 (Surr)	62		36 - 120	10/17/16 08:33	10/18/16 14:04	1
Phenol-d5 (Surr)	14		10 - 120	10/17/16 08:33	10/18/16 14:04	1
Terphenyl-d14 (Surr)	72		17 - 120	10/17/16 08:33	10/18/16 14:04	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.080		0.50	0.080	ug/L			10/23/16 18:34	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	81		76 - 121		10/23/16 18:34	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	0.17		0.097	0.015	ug/L		10/15/16 10:30	10/21/16 15:41	4

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	100		18 - 125	10/15/16 10:30	10/21/16 15:41	4

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.35		5.0	0.35	ug/L		10/13/16 14:00	10/21/16 00:48	1
Copper	0.71	J B	2.0	0.36	ug/L		10/13/16 14:00	10/21/16 00:48	1
Iron	<5.3		100	5.3	ug/L		10/13/16 14:00	10/21/16 00:48	1
Manganese	0.27	J B	5.0	0.25	ug/L		10/13/16 14:00	10/21/16 00:48	1
Zinc	<6.2		20.0	6.2	ug/L		10/13/16 14:00	10/21/16 00:48	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	31.1		5.0	1.9	mg/L			10/18/16 19:37	1
Hardness as calcium carbonate	54.0		5.0	3.1	mg/L			10/14/16 08:47	1
Chloride	16.9		1.0	0.41	mg/L			10/16/16 00:19	1
Nitrate as N	1.6		0.10	0.035	mg/L			10/12/16 13:41	1

TestAmerica Canton

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Client Sample ID: W-161010-PS-06

Lab Sample ID: 240-70706-6

Date Collected: 10/10/16 16:00

Matrix: Water

Date Received: 10/12/16 09:20

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	2.7		1.0	0.13	mg/L			10/12/16 13:41	1
Total Organic Carbon	0.44	J B	1.0	0.080	mg/L			10/14/16 00:13	1

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Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Client Sample ID: W-161011-PS-07

Lab Sample ID: 240-70706-7

Date Collected: 10/11/16 09:35

Matrix: Water

Date Received: 10/12/16 09:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/18/16 19:31	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/18/16 19:31	1
Toluene	<0.23		1.0	0.23	ug/L			10/18/16 19:31	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/18/16 19:31	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	116		63 - 132		10/18/16 19:31	1
4-Bromofluorobenzene (Surr)	94		73 - 120		10/18/16 19:31	1
Toluene-d8 (Surr)	98		73 - 124		10/18/16 19:31	1
Dibromofluoromethane (Surr)	101		80 - 120		10/18/16 19:31	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.060		0.19	0.060	ug/L		10/17/16 12:43	10/20/16 12:45	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	74		42 - 120	10/17/16 12:43	10/20/16 12:45	1
2-Fluorophenol (Surr)	31		10 - 120	10/17/16 12:43	10/20/16 12:45	1
2,4,6-Tribromophenol (Surr)	68		35 - 125	10/17/16 12:43	10/20/16 12:45	1
Nitrobenzene-d5 (Surr)	64		36 - 120	10/17/16 12:43	10/20/16 12:45	1
Phenol-d5 (Surr)	16		10 - 120	10/17/16 12:43	10/20/16 12:45	1
Terphenyl-d14 (Surr)	77		17 - 120	10/17/16 12:43	10/20/16 12:45	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.080		0.50	0.080	ug/L			10/23/16 18:51	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	81		76 - 121		10/23/16 18:51	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.015		0.094	0.015	ug/L		10/15/16 10:30	10/21/16 16:52	4

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	51		18 - 125	10/15/16 10:30	10/21/16 16:52	4

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.71	J	5.0	0.35	ug/L		10/13/16 14:00	10/21/16 00:52	1
Copper	0.90	J B	2.0	0.36	ug/L		10/13/16 14:00	10/21/16 00:52	1
Iron	<5.3		100	5.3	ug/L		10/13/16 14:00	10/21/16 00:52	1
Manganese	0.38	J B	5.0	0.25	ug/L		10/13/16 14:00	10/21/16 00:52	1
Zinc	<6.2		20.0	6.2	ug/L		10/13/16 14:00	10/21/16 00:52	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	194		5.0	1.9	mg/L			10/18/16 19:47	1
Hardness as calcium carbonate	230		5.0	3.1	mg/L			10/14/16 08:50	1
Chloride	32.3		1.0	0.41	mg/L			10/12/16 16:22	1
Nitrate as N	1.9		0.10	0.035	mg/L			10/12/16 16:22	1

TestAmerica Canton

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Client Sample ID: W-161011-PS-07

Lab Sample ID: 240-70706-7

Date Collected: 10/11/16 09:35

Matrix: Water

Date Received: 10/12/16 09:20

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	8.1		1.0	0.13	mg/L			10/12/16 16:22	1
Total Organic Carbon	0.54	J B	1.0	0.080	mg/L			10/14/16 00:40	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Client Sample ID: W-161011-PS-08

Lab Sample ID: 240-70706-8

Date Collected: 10/11/16 10:25

Matrix: Water

Date Received: 10/12/16 09:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/18/16 19:53	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/18/16 19:53	1
Toluene	<0.23		1.0	0.23	ug/L			10/18/16 19:53	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/18/16 19:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	120		63 - 132		10/18/16 19:53	1
4-Bromofluorobenzene (Surr)	100		73 - 120		10/18/16 19:53	1
Toluene-d8 (Surr)	101		73 - 124		10/18/16 19:53	1
Dibromofluoromethane (Surr)	114		80 - 120		10/18/16 19:53	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.060		0.19	0.060	ug/L		10/17/16 12:43	10/20/16 13:10	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	71		42 - 120	10/17/16 12:43	10/20/16 13:10	1
2-Fluorophenol (Surr)	30		10 - 120	10/17/16 12:43	10/20/16 13:10	1
2,4,6-Tribromophenol (Surr)	63		35 - 125	10/17/16 12:43	10/20/16 13:10	1
Nitrobenzene-d5 (Surr)	65		36 - 120	10/17/16 12:43	10/20/16 13:10	1
Phenol-d5 (Surr)	17		10 - 120	10/17/16 12:43	10/20/16 13:10	1
Terphenyl-d14 (Surr)	72		17 - 120	10/17/16 12:43	10/20/16 13:10	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.080		0.50	0.080	ug/L			10/23/16 19:25	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	78		76 - 121		10/23/16 19:25	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.015		0.094	0.015	ug/L		10/15/16 10:30	10/21/16 17:16	4

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	55		18 - 125	10/15/16 10:30	10/21/16 17:16	4

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.80	J	5.0	0.35	ug/L		10/13/16 14:00	10/21/16 00:56	1
Copper	0.76	J B	2.0	0.36	ug/L		10/13/16 14:00	10/21/16 00:56	1
Iron	<5.3		100	5.3	ug/L		10/13/16 14:00	10/21/16 00:56	1
Manganese	0.28	J B	5.0	0.25	ug/L		10/13/16 14:00	10/21/16 00:56	1
Zinc	<6.2		20.0	6.2	ug/L		10/13/16 14:00	10/21/16 00:56	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	208		5.0	1.9	mg/L			10/18/16 19:58	1
Hardness as calcium carbonate	348		5.0	3.1	mg/L			10/14/16 08:52	1
Chloride	17.0		1.0	0.41	mg/L			10/12/16 16:42	1
Nitrate as N	2.7		0.10	0.035	mg/L			10/12/16 16:42	1

TestAmerica Canton

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Client Sample ID: W-161011-PS-08

Lab Sample ID: 240-70706-8

Date Collected: 10/11/16 10:25

Matrix: Water

Date Received: 10/12/16 09:20

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	136		1.0	0.13	mg/L			10/12/16 16:42	1
Total Organic Carbon	0.36	J B	1.0	0.080	mg/L			10/14/16 01:06	1

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Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Client Sample ID: W-161011-PS-09

Lab Sample ID: 240-70706-9

Date Collected: 10/11/16 11:20

Matrix: Water

Date Received: 10/12/16 09:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/18/16 20:15	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/18/16 20:15	1
Toluene	<0.23		1.0	0.23	ug/L			10/18/16 20:15	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/18/16 20:15	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	122		63 - 132		10/18/16 20:15	1
4-Bromofluorobenzene (Surr)	105		73 - 120		10/18/16 20:15	1
Toluene-d8 (Surr)	104		73 - 124		10/18/16 20:15	1
Dibromofluoromethane (Surr)	113		80 - 120		10/18/16 20:15	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.060		0.19	0.060	ug/L		10/17/16 12:43	10/20/16 13:35	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	66		42 - 120	10/17/16 12:43	10/20/16 13:35	1
2-Fluorophenol (Surr)	26		10 - 120	10/17/16 12:43	10/20/16 13:35	1
2,4,6-Tribromophenol (Surr)	62		35 - 125	10/17/16 12:43	10/20/16 13:35	1
Nitrobenzene-d5 (Surr)	60		36 - 120	10/17/16 12:43	10/20/16 13:35	1
Phenol-d5 (Surr)	14		10 - 120	10/17/16 12:43	10/20/16 13:35	1
Terphenyl-d14 (Surr)	69		17 - 120	10/17/16 12:43	10/20/16 13:35	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.080		0.50	0.080	ug/L			10/23/16 19:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	78		76 - 121		10/23/16 19:42	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	5.7		0.095	0.015	ug/L		10/15/16 10:30	10/21/16 17:40	4

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	64		18 - 125	10/15/16 10:30	10/21/16 17:40	4

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.38	J	5.0	0.35	ug/L		10/13/16 14:00	10/21/16 01:01	1
Copper	1.8	J B	2.0	0.36	ug/L		10/13/16 14:00	10/21/16 01:01	1
Iron	6.2	J B	100	5.3	ug/L		10/13/16 14:00	10/21/16 01:01	1
Manganese	0.44	J B	5.0	0.25	ug/L		10/13/16 14:00	10/21/16 01:01	1
Zinc	<6.2		20.0	6.2	ug/L		10/13/16 14:00	10/21/16 01:01	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	30.5		5.0	1.9	mg/L			10/18/16 20:06	1
Hardness as calcium carbonate	82.0		5.0	3.1	mg/L			10/14/16 08:55	1
Chloride	74.4		1.0	0.41	mg/L			10/12/16 17:02	1
Nitrate as N	1.8		0.10	0.035	mg/L			10/12/16 17:02	1

TestAmerica Canton

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Client Sample ID: W-161011-PS-09

Lab Sample ID: 240-70706-9

Date Collected: 10/11/16 11:20

Matrix: Water

Date Received: 10/12/16 09:20

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	6.6		1.0	0.13	mg/L			10/12/16 17:02	1
Total Organic Carbon	0.61	J B	1.0	0.080	mg/L			10/14/16 01:34	1

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Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Client Sample ID: W-161011-PS-10

Lab Sample ID: 240-70706-10

Date Collected: 10/11/16 12:15

Matrix: Water

Date Received: 10/12/16 09:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/18/16 20:37	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/18/16 20:37	1
Toluene	<0.23		1.0	0.23	ug/L			10/18/16 20:37	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/18/16 20:37	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	127		63 - 132		10/18/16 20:37	1
4-Bromofluorobenzene (Surr)	102		73 - 120		10/18/16 20:37	1
Toluene-d8 (Surr)	101		73 - 124		10/18/16 20:37	1
Dibromofluoromethane (Surr)	116		80 - 120		10/18/16 20:37	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.062		0.20	0.062	ug/L		10/18/16 12:10	10/21/16 11:25	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	65		42 - 120	10/18/16 12:10	10/21/16 11:25	1
2-Fluorophenol (Surr)	34		10 - 120	10/18/16 12:10	10/21/16 11:25	1
2,4,6-Tribromophenol (Surr)	62		35 - 125	10/18/16 12:10	10/21/16 11:25	1
Nitrobenzene-d5 (Surr)	65		36 - 120	10/18/16 12:10	10/21/16 11:25	1
Phenol-d5 (Surr)	18		10 - 120	10/18/16 12:10	10/21/16 11:25	1
Terphenyl-d14 (Surr)	67		17 - 120	10/18/16 12:10	10/21/16 11:25	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	1.5		0.50	0.080	ug/L			10/23/16 19:59	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	81		76 - 121		10/23/16 19:59	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	0.45		0.094	0.015	ug/L		10/15/16 10:30	10/21/16 18:04	4

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	55		18 - 125	10/15/16 10:30	10/21/16 18:04	4

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.35		5.0	0.35	ug/L		10/13/16 14:00	10/21/16 01:05	1
Copper	1.7	J B	2.0	0.36	ug/L		10/13/16 14:00	10/21/16 01:05	1
Iron	171	B	100	5.3	ug/L		10/13/16 14:00	10/21/16 01:05	1
Manganese	14.8	B	5.0	0.25	ug/L		10/13/16 14:00	10/21/16 01:05	1
Zinc	<6.2		20.0	6.2	ug/L		10/13/16 14:00	10/21/16 01:05	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	233		5.0	1.9	mg/L			10/18/16 20:16	1
Hardness as calcium carbonate	268		5.0	3.1	mg/L			10/14/16 08:57	1
Chloride	46.8		1.0	0.41	mg/L			10/12/16 17:22	1
Nitrate as N	1.8		0.10	0.035	mg/L			10/12/16 17:22	1

TestAmerica Canton

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Client Sample ID: W-161011-PS-10

Lab Sample ID: 240-70706-10

Date Collected: 10/11/16 12:15

Matrix: Water

Date Received: 10/12/16 09:20

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	12.7		1.0	0.13	mg/L			10/12/16 17:22	1
Total Organic Carbon	1.1	B	1.0	0.080	mg/L			10/14/16 02:01	1

Surrogate Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		12DCE (63-132)	BFB (73-120)	TOL (73-124)	DBFM (80-120)
240-70706-1	W-161010-PS-01	123	96	101	99
240-70706-2	W-161010-PS-02	125	103	113	114
240-70706-2 MS	W-161010-PS-02	130	102	118	107
240-70706-2 MSD	W-161010-PS-02	127	105	116	110
240-70706-3	W-161010-PS-03	121	93	106	100
240-70706-4	W-161010-PS-04	121	97	106	103
240-70706-5	W-161010-PS-05	126	92	104	102
240-70706-6	W-161010-PS-06	122	99	104	106
240-70706-7	W-161011-PS-07	116	94	98	101
240-70706-8	W-161011-PS-08	120	100	101	114
240-70706-9	W-161011-PS-09	122	105	104	113
240-70706-10	W-161011-PS-10	127	102	101	116
LCS 240-252003/4	Lab Control Sample	123	101	101	98
MB 240-252003/6	Method Blank	120	93	102	102

Surrogate Legend

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

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)					
		FBP (42-120)	2FP (10-120)	TBP (35-125)	NBZ (36-120)	PHL (10-120)	TPH (17-120)
240-70706-1	W-161010-PS-01	59	27	56	65	15	64
240-70706-2	W-161010-PS-02	63	30	70	60	17	61
240-70706-2 MS	W-161010-PS-02	70	37	73	69	23	41
240-70706-2 MSD	W-161010-PS-02	75	32	77	74	18	41
240-70706-3	W-161010-PS-03	69	34	61	71	19	62
240-70706-4	W-161010-PS-04	80	30	58	83	17	76
240-70706-5	W-161010-PS-05	83	39	73	81	21	79
240-70706-6	W-161010-PS-06	63	25	62	62	14	72
240-70706-7	W-161011-PS-07	74	31	68	64	16	77
240-70706-8	W-161011-PS-08	71	30	63	65	17	72
240-70706-9	W-161011-PS-09	66	26	62	60	14	69
240-70706-10	W-161011-PS-10	65	34	62	65	18	67
LCS 240-251667/23-A	Lab Control Sample	93	65	86	89	43	96
LCS 240-251757/24-A	Lab Control Sample	70	60	70	69	42	81
LCS 240-251958/19-A	Lab Control Sample	88	67	99	84	48	108
MB 240-251667/22-A	Method Blank	86	63	74	82	44	98
MB 240-251757/23-A	Method Blank	66	49	60	57	34	78
MB 240-251958/18-A	Method Blank	80	57	57	74	39	97

Surrogate Legend

FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
TBP = 2,4,6-Tribromophenol (Surr)

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Surrogate Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14 (Surr)

Method: RSK-175 - Dissolved Gases (GC)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)	
		Trifluoroet (76-121)	
240-70706-2	W-161010-PS-02	88	
240-70706-2 MS	W-161010-PS-02	83	
240-70706-2 MSD	W-161010-PS-02	85	
240-70706-3	W-161010-PS-03	84	
240-70706-4	W-161010-PS-04	85	
240-70706-5	W-161010-PS-05	82	
240-70706-6	W-161010-PS-06	81	
240-70706-7	W-161011-PS-07	81	
240-70706-8	W-161011-PS-08	78	
240-70706-9	W-161011-PS-09	78	
240-70706-10	W-161011-PS-10	81	
LCS 240-252645/5	Lab Control Sample	87	
MB 240-252645/4	Method Blank	89	

Surrogate Legend

1,1,1-Trifluoroethane = 1,1,1-Trifluoroethane

Method: 8151A - Herbicides (GC)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)	
		DCPA1 (18-125)	DCPA2 (18-125)
240-70706-1	W-161010-PS-01	36	41
240-70706-2	W-161010-PS-02	63	64
240-70706-2 MS	W-161010-PS-02	66	64
240-70706-2 MSD	W-161010-PS-02	63	58
240-70706-3	W-161010-PS-03	0 X D	0 X D
240-70706-4	W-161010-PS-04	68	67
240-70706-5	W-161010-PS-05	52	59
240-70706-6	W-161010-PS-06	100	93
240-70706-7	W-161011-PS-07	45	51
240-70706-8	W-161011-PS-08	49	55
240-70706-9	W-161011-PS-09	64	51
240-70706-10	W-161011-PS-10	54	55
LCS 180-191291/2-A	Lab Control Sample	51	53
MB 180-191291/1-A	Method Blank	83	95

Surrogate Legend

DCPA = 2,4-Dichlorophenylacetic acid

QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-252003/6
Matrix: Water
Analysis Batch: 252003

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/18/16 17:20	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/18/16 17:20	1
Toluene	<0.23		1.0	0.23	ug/L			10/18/16 17:20	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/18/16 17:20	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	120		63 - 132		10/18/16 17:20	1
4-Bromofluorobenzene (Surr)	93		73 - 120		10/18/16 17:20	1
Toluene-d8 (Surr)	102		73 - 124		10/18/16 17:20	1
Dibromofluoromethane (Surr)	102		80 - 120		10/18/16 17:20	1

Lab Sample ID: LCS 240-252003/4
Matrix: Water
Analysis Batch: 252003

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	10.0	9.87		ug/L		99	80 - 120
Ethylbenzene	10.0	9.80		ug/L		98	80 - 120
Toluene	10.0	10.2		ug/L		102	80 - 121
Xylenes, Total	20.0	19.5		ug/L		97	80 - 120
m-Xylene & p-Xylene	10.0	9.88		ug/L		99	80 - 120
o-Xylene	10.0	9.59		ug/L		96	80 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	123		63 - 132
4-Bromofluorobenzene (Surr)	101		73 - 120
Toluene-d8 (Surr)	101		73 - 124
Dibromofluoromethane (Surr)	98		80 - 120

Lab Sample ID: 240-70706-2 MS
Matrix: Water
Analysis Batch: 252003

Client Sample ID: W-161010-PS-02
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	<0.28		10.0	9.93		ug/L		99	67 - 126
Ethylbenzene	<0.26		10.0	9.18		ug/L		92	66 - 123
Toluene	<0.23		10.0	10.8		ug/L		108	63 - 130
Xylenes, Total	<0.24		20.0	18.1		ug/L		90	60 - 126
m-Xylene & p-Xylene	<0.24		10.0	8.83		ug/L		88	58 - 127
o-Xylene	<0.28		10.0	9.26		ug/L		93	61 - 126

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	130		63 - 132
4-Bromofluorobenzene (Surr)	102		73 - 120
Toluene-d8 (Surr)	118		73 - 124
Dibromofluoromethane (Surr)	107		80 - 120

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QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

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

Lab Sample ID: 240-70706-2 MSD

Matrix: Water

Analysis Batch: 252003

Client Sample ID: W-161010-PS-02

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	<0.28		10.0	9.44		ug/L		94	67 - 126	5	31
Ethylbenzene	<0.26		10.0	8.89		ug/L		89	66 - 123	3	34
Toluene	<0.23		10.0	10.2		ug/L		102	63 - 130	6	33
Xylenes, Total	<0.24		20.0	17.9		ug/L		89	60 - 126	1	35
m-Xylene & p-Xylene	<0.24		10.0	8.87		ug/L		89	58 - 127	0	35
o-Xylene	<0.28		10.0	8.99		ug/L		90	61 - 126	3	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	127		63 - 132
4-Bromofluorobenzene (Surr)	105		73 - 120
Toluene-d8 (Surr)	116		73 - 124
Dibromofluoromethane (Surr)	110		80 - 120

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-251667/22-A

Matrix: Water

Analysis Batch: 251864

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 251667

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.063		0.20	0.063	ug/L		10/17/16 08:33	10/18/16 08:35	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	86		42 - 120	10/17/16 08:33	10/18/16 08:35	1
2-Fluorophenol (Surr)	63		10 - 120	10/17/16 08:33	10/18/16 08:35	1
2,4,6-Tribromophenol (Surr)	74		35 - 125	10/17/16 08:33	10/18/16 08:35	1
Nitrobenzene-d5 (Surr)	82		36 - 120	10/17/16 08:33	10/18/16 08:35	1
Phenol-d5 (Surr)	44		10 - 120	10/17/16 08:33	10/18/16 08:35	1
Terphenyl-d14 (Surr)	98		17 - 120	10/17/16 08:33	10/18/16 08:35	1

Lab Sample ID: LCS 240-251667/23-A

Matrix: Water

Analysis Batch: 251864

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 251667

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Naphthalene	20.0	17.6		ug/L		88	54 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2-Fluorobiphenyl (Surr)	93		42 - 120
2-Fluorophenol (Surr)	65		10 - 120
2,4,6-Tribromophenol (Surr)	86		35 - 125
Nitrobenzene-d5 (Surr)	89		36 - 120
Phenol-d5 (Surr)	43		10 - 120
Terphenyl-d14 (Surr)	96		17 - 120

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QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-251757/23-A
Matrix: Water
Analysis Batch: 252060

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 251757

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.063		0.20	0.063	ug/L		10/17/16 12:43	10/19/16 10:29	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	66		42 - 120	10/17/16 12:43	10/19/16 10:29	1
2-Fluorophenol (Surr)	49		10 - 120	10/17/16 12:43	10/19/16 10:29	1
2,4,6-Tribromophenol (Surr)	60		35 - 125	10/17/16 12:43	10/19/16 10:29	1
Nitrobenzene-d5 (Surr)	57		36 - 120	10/17/16 12:43	10/19/16 10:29	1
Phenol-d5 (Surr)	34		10 - 120	10/17/16 12:43	10/19/16 10:29	1
Terphenyl-d14 (Surr)	78		17 - 120	10/17/16 12:43	10/19/16 10:29	1

Lab Sample ID: LCS 240-251757/24-A
Matrix: Water
Analysis Batch: 252060

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 251757

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Naphthalene	20.0	13.1		ug/L		65	54 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2-Fluorobiphenyl (Surr)	70		42 - 120
2-Fluorophenol (Surr)	60		10 - 120
2,4,6-Tribromophenol (Surr)	70		35 - 125
Nitrobenzene-d5 (Surr)	69		36 - 120
Phenol-d5 (Surr)	42		10 - 120
Terphenyl-d14 (Surr)	81		17 - 120

Lab Sample ID: 240-70706-2 MS
Matrix: Water
Analysis Batch: 252250

Client Sample ID: W-161010-PS-02
Prep Type: Total/NA
Prep Batch: 251757

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Naphthalene	<0.060		21.3	13.9		ug/L		65	37 - 120

Surrogate	MS %Recovery	MS Qualifier	Limits
2-Fluorobiphenyl (Surr)	70		42 - 120
2-Fluorophenol (Surr)	37		10 - 120
2,4,6-Tribromophenol (Surr)	73		35 - 125
Nitrobenzene-d5 (Surr)	69		36 - 120
Phenol-d5 (Surr)	23		10 - 120
Terphenyl-d14 (Surr)	41		17 - 120

Lab Sample ID: 240-70706-2 MSD
Matrix: Water
Analysis Batch: 252250

Client Sample ID: W-161010-PS-02
Prep Type: Total/NA
Prep Batch: 251757

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	RPD Limit
Naphthalene	<0.060		19.0	13.2		ug/L		69	37 - 120	6	33

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QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-70706-2 MSD
Matrix: Water
Analysis Batch: 252250

Client Sample ID: W-161010-PS-02
Prep Type: Total/NA
Prep Batch: 251757

Surrogate	MSD %Recovery	MSD Qualifier	Limits
2-Fluorobiphenyl (Surr)	75		42 - 120
2-Fluorophenol (Surr)	32		10 - 120
2,4,6-Tribromophenol (Surr)	77		35 - 125
Nitrobenzene-d5 (Surr)	74		36 - 120
Phenol-d5 (Surr)	18		10 - 120
Terphenyl-d14 (Surr)	41		17 - 120

Lab Sample ID: MB 240-251958/18-A
Matrix: Water
Analysis Batch: 252258

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 251958

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.063		0.20	0.063	ug/L		10/18/16 12:18	10/20/16 10:54	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	80		42 - 120	10/18/16 12:18	10/20/16 10:54	1
2-Fluorophenol (Surr)	57		10 - 120	10/18/16 12:18	10/20/16 10:54	1
2,4,6-Tribromophenol (Surr)	57		35 - 125	10/18/16 12:18	10/20/16 10:54	1
Nitrobenzene-d5 (Surr)	74		36 - 120	10/18/16 12:18	10/20/16 10:54	1
Phenol-d5 (Surr)	39		10 - 120	10/18/16 12:18	10/20/16 10:54	1
Terphenyl-d14 (Surr)	97		17 - 120	10/18/16 12:18	10/20/16 10:54	1

Lab Sample ID: LCS 240-251958/19-A
Matrix: Water
Analysis Batch: 252258

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 251958

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Naphthalene	20.0	16.1		ug/L		81	54 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2-Fluorobiphenyl (Surr)	88		42 - 120
2-Fluorophenol (Surr)	67		10 - 120
2,4,6-Tribromophenol (Surr)	99		35 - 125
Nitrobenzene-d5 (Surr)	84		36 - 120
Phenol-d5 (Surr)	48		10 - 120
Terphenyl-d14 (Surr)	108		17 - 120

Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 240-252645/4
Matrix: Water
Analysis Batch: 252645

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.080		0.50	0.080	ug/L			10/23/16 16:17	1

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QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

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

Lab Sample ID: MB 240-252645/4
Matrix: Water
Analysis Batch: 252645

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

Surrogate	<i>MB</i> %Recovery	<i>MB</i> Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	89		76 - 121		10/23/16 16:17	1

Lab Sample ID: LCS 240-252645/5
Matrix: Water
Analysis Batch: 252645

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Methane	199	193		ug/L		97	80 - 130

Surrogate	<i>LCS</i> %Recovery	<i>LCS</i> Qualifier	Limits
1,1,1-Trifluoroethane	87		76 - 121

Lab Sample ID: 240-70706-2 MS
Matrix: Water
Analysis Batch: 252645

Client Sample ID: W-161010-PS-02
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Methane	<0.080		199	199		ug/L		100	48 - 159

Surrogate	<i>MS</i> %Recovery	<i>MS</i> Qualifier	Limits
1,1,1-Trifluoroethane	83		76 - 121

Lab Sample ID: 240-70706-2 MSD
Matrix: Water
Analysis Batch: 252645

Client Sample ID: W-161010-PS-02
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Methane	<0.080		199	201		ug/L		101	48 - 159	1	23

Surrogate	<i>MSD</i> %Recovery	<i>MSD</i> Qualifier	Limits
1,1,1-Trifluoroethane	85		76 - 121

Method: 8151A - Herbicides (GC)

Lab Sample ID: MB 180-191291/1-A
Matrix: Water
Analysis Batch: 191929

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 191291

Analyte	<i>MB</i> Result	<i>MB</i> Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.016		0.10	0.016	ug/L		10/15/16 10:30	10/21/16 12:29	4

Surrogate	<i>MB</i> %Recovery	<i>MB</i> Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	95		18 - 125	10/15/16 10:30	10/21/16 12:29	4

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QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Method: 8151A - Herbicides (GC) (Continued)

Lab Sample ID: LCS 180-191291/2-A
Matrix: Water
Analysis Batch: 191929

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 191291

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Pentachlorophenol	1.00	1.03		ug/L		103	30 - 150
Surrogate		LCS %Recovery	LCS Qualifier				Limits
2,4-Dichlorophenylacetic acid		53					18 - 125

Lab Sample ID: 240-70706-2 MS
Matrix: Water
Analysis Batch: 191929

Client Sample ID: W-161010-PS-02
Prep Type: Total/NA
Prep Batch: 191291

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Pentachlorophenol	0.37		0.943	1.38		ug/L		107	30 - 150
Surrogate		MS %Recovery							Limits
2,4-Dichlorophenylacetic acid		66							18 - 125

Lab Sample ID: 240-70706-2 MSD
Matrix: Water
Analysis Batch: 191929

Client Sample ID: W-161010-PS-02
Prep Type: Total/NA
Prep Batch: 191291

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Pentachlorophenol	0.37		0.943	1.65		ug/L		136	30 - 150	18	35
Surrogate		MSD %Recovery							Limits		Limit
2,4-Dichlorophenylacetic acid		63							18 - 125		

Method: 6020 - Metals (ICP/MS)

Lab Sample ID: MB 240-251212/1-A
Matrix: Water
Analysis Batch: 252428

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 251212

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.35		5.0	0.35	ug/L		10/13/16 14:00	10/20/16 23:43	1
Copper	2.86		2.0	0.36	ug/L		10/13/16 14:00	10/20/16 23:43	1
Iron	94.34	J	100	5.3	ug/L		10/13/16 14:00	10/20/16 23:43	1
Manganese	0.654	J	5.0	0.25	ug/L		10/13/16 14:00	10/20/16 23:43	1
Zinc	<6.2		20.0	6.2	ug/L		10/13/16 14:00	10/20/16 23:43	1

Lab Sample ID: LCS 240-251212/2-A
Matrix: Water
Analysis Batch: 252428

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 251212

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Arsenic	1000	960.7		ug/L		96	80 - 120
Copper	1000	1109		ug/L		111	80 - 120
Iron	10000	10690		ug/L		107	80 - 120
Manganese	1000	1075		ug/L		108	80 - 120

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QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Method: 6020 - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 240-251212/2-A
Matrix: Water
Analysis Batch: 252428

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 251212

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Zinc	1000	1086		ug/L		109	80 - 120

Lab Sample ID: 240-70706-2 MS
Matrix: Water
Analysis Batch: 252428

Client Sample ID: W-161010-PS-02
Prep Type: Dissolved
Prep Batch: 251212

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	0.87	J	1000	926.2		ug/L		93	75 - 125
Copper	2.3	B	1000	1052		ug/L		105	75 - 125
Iron	23.2	J B	10000	10170		ug/L		101	75 - 125
Manganese	0.94	J B	1000	1020		ug/L		102	75 - 125
Zinc	<6.2		1000	1030		ug/L		103	75 - 125

Lab Sample ID: 240-70706-2 MSD
Matrix: Water
Analysis Batch: 252428

Client Sample ID: W-161010-PS-02
Prep Type: Dissolved
Prep Batch: 251212

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Arsenic	0.87	J	1000	917.1		ug/L		92	75 - 125	1	20
Copper	2.3	B	1000	1053		ug/L		105	75 - 125	0	20
Iron	23.2	J B	10000	10170		ug/L		101	75 - 125	0	20
Manganese	0.94	J B	1000	1016		ug/L		101	75 - 125	0	20
Zinc	<6.2		1000	1032		ug/L		103	75 - 125	0	20

Method: 2320B-1997 - Alkalinity, Total

Lab Sample ID: MB 240-252082/30
Matrix: Water
Analysis Batch: 252082

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	<1.9		5.0	1.9	mg/L			10/18/16 19:06	1

Lab Sample ID: MB 240-252082/5
Matrix: Water
Analysis Batch: 252082

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	<1.9		5.0	1.9	mg/L			10/18/16 14:49	1

Lab Sample ID: LCS 240-252082/29
Matrix: Water
Analysis Batch: 252082

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	368	374.6		mg/L		102	86 - 123

TestAmerica Canton

QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Method: 2320B-1997 - Alkalinity, Total (Continued)

Lab Sample ID: LCS 240-252082/4
Matrix: Water
Analysis Batch: 252082

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	368	370.5		mg/L		101	86 - 123

Lab Sample ID: 240-70706-2 MS
Matrix: Water
Analysis Batch: 252082

Client Sample ID: W-161010-PS-02
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	49.3		500	563.2		mg/L		103	10 - 190

Lab Sample ID: 240-70706-2 MSD
Matrix: Water
Analysis Batch: 252082

Client Sample ID: W-161010-PS-02
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Alkalinity	49.3		500	582.2		mg/L		107	10 - 190	3	35

Lab Sample ID: 240-70706-2 DU
Matrix: Water
Analysis Batch: 252082

Client Sample ID: W-161010-PS-02
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Alkalinity	49.3		49.43		mg/L		0.3	20

Lab Sample ID: 240-70706-4 DU
Matrix: Water
Analysis Batch: 252082

Client Sample ID: W-161010-PS-04
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Alkalinity	64.7		65.80		mg/L		2	20

Method: 2340C-1997 - Hardness, Total

Lab Sample ID: MB 240-251399/1
Matrix: Water
Analysis Batch: 251399

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	<3.1		5.0	3.1	mg/L			10/14/16 08:00	1

Lab Sample ID: LCS 240-251399/2
Matrix: Water
Analysis Batch: 251399

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Hardness as calcium carbonate	170	164.0		mg/L		96	80 - 120

TestAmerica Canton

QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Method: 2340C-1997 - Hardness, Total (Continued)

Lab Sample ID: 240-70706-2 MS

Matrix: Water

Analysis Batch: 251399

Client Sample ID: W-161010-PS-02

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Hardness as calcium carbonate	56.0		200	248.0		mg/L		96	80 - 120

Lab Sample ID: 240-70706-2 MSD

Matrix: Water

Analysis Batch: 251399

Client Sample ID: W-161010-PS-02

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Hardness as calcium carbonate	56.0		200	250.0		mg/L		97	80 - 120	1	10

Lab Sample ID: 240-70706-2 DU

Matrix: Water

Analysis Batch: 251399

Client Sample ID: W-161010-PS-02

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Hardness as calcium carbonate	56.0		56.00		mg/L		0	20

Lab Sample ID: 240-70706-3 DU

Matrix: Water

Analysis Batch: 251399

Client Sample ID: W-161010-PS-03

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Hardness as calcium carbonate	272		274.0		mg/L		0.7	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 240-250846/27

Matrix: Water

Analysis Batch: 250846

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.41		1.0	0.41	mg/L			10/12/16 11:48	1
Sulfate	<0.13		1.0	0.13	mg/L			10/12/16 11:48	1

Lab Sample ID: MB 240-250846/3

Matrix: Water

Analysis Batch: 250846

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.41		1.0	0.41	mg/L			10/12/16 03:45	1
Sulfate	<0.13		1.0	0.13	mg/L			10/12/16 03:45	1

Lab Sample ID: LCS 240-250846/28

Matrix: Water

Analysis Batch: 250846

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.99		mg/L		102	90 - 110
Sulfate	50.0	52.25		mg/L		104	90 - 110

TestAmerica Canton

QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 240-250846/4
Matrix: Water
Analysis Batch: 250846

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.91		mg/L		102	90 - 110
Sulfate	50.0	52.01		mg/L		104	90 - 110

Lab Sample ID: 240-70706-2 MS
Matrix: Water
Analysis Batch: 250846

Client Sample ID: W-161010-PS-02
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	3.1	F1	50.0	64.83	F1	mg/L		123	80 - 120

Lab Sample ID: 240-70706-2 MSD
Matrix: Water
Analysis Batch: 250846

Client Sample ID: W-161010-PS-02
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Sulfate	3.1	F1	50.0	47.79	F2	mg/L		89	80 - 120	30	15

Lab Sample ID: MB 240-251049/27
Matrix: Water
Analysis Batch: 251049

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	<0.035		0.10	0.035	mg/L			10/12/16 11:48	1

Lab Sample ID: LCS 240-251049/28
Matrix: Water
Analysis Batch: 251049

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	2.50	2.57		mg/L		103	90 - 110

Lab Sample ID: 240-70706-2 MS
Matrix: Water
Analysis Batch: 251049

Client Sample ID: W-161010-PS-02
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	0.58	H F1	2.50	3.79	H F1	mg/L		128	80 - 120

Lab Sample ID: 240-70706-2 MSD
Matrix: Water
Analysis Batch: 251049

Client Sample ID: W-161010-PS-02
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Nitrate as N	0.58	H F1	2.50	2.90	H F2	mg/L		93	80 - 120	27	15

TestAmerica Canton

QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: MB 240-251493/3
Matrix: Water
Analysis Batch: 251493

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.41		1.0	0.41	mg/L			10/15/16 21:18	1

Lab Sample ID: LCS 240-251493/4
Matrix: Water
Analysis Batch: 251493

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	48.52		mg/L		97	90 - 110

Lab Sample ID: 240-70706-2 MS
Matrix: Water
Analysis Batch: 251493

Client Sample ID: W-161010-PS-02
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	0.98	J	50.0	49.96		mg/L		98	80 - 120

Lab Sample ID: 240-70706-2 MSD
Matrix: Water
Analysis Batch: 251493

Client Sample ID: W-161010-PS-02
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	0.98	J	50.0	51.20		mg/L		100	80 - 120	2	15

Method: 9060 - Organic Carbon, Total (TOC)

Lab Sample ID: MB 240-251349/4
Matrix: Water
Analysis Batch: 251349

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	0.231	J	1.0	0.080	mg/L			10/13/16 14:44	1

Lab Sample ID: LCS 240-251349/6
Matrix: Water
Analysis Batch: 251349

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	46.3	50.08		mg/L		108	80 - 120

Lab Sample ID: LLCS 240-251349/5
Matrix: Water
Analysis Batch: 251349

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

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	4.63	5.03		mg/L		109	88 - 115

TestAmerica Canton

QC Sample Results

Client: GHD Services Inc.
 Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

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

Lab Sample ID: 240-70706-2 MS

Matrix: Water

Analysis Batch: 251349

Client Sample ID: W-161010-PS-02

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	1.9	B	25.0	24.84		mg/L		92	65 - 134

Lab Sample ID: 240-70706-2 MSD

Matrix: Water

Analysis Batch: 251349

Client Sample ID: W-161010-PS-02

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon	1.9	B	25.0	25.06		mg/L		92	65 - 134	1	10

QC Association Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

GC/MS VOA

Analysis Batch: 252003

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70706-1	W-161010-PS-01	Total/NA	Water	8260B	
240-70706-2	W-161010-PS-02	Total/NA	Water	8260B	
240-70706-3	W-161010-PS-03	Total/NA	Water	8260B	
240-70706-4	W-161010-PS-04	Total/NA	Water	8260B	
240-70706-5	W-161010-PS-05	Total/NA	Water	8260B	
240-70706-6	W-161010-PS-06	Total/NA	Water	8260B	
240-70706-7	W-161011-PS-07	Total/NA	Water	8260B	
240-70706-8	W-161011-PS-08	Total/NA	Water	8260B	
240-70706-9	W-161011-PS-09	Total/NA	Water	8260B	
240-70706-10	W-161011-PS-10	Total/NA	Water	8260B	
MB 240-252003/6	Method Blank	Total/NA	Water	8260B	
LCS 240-252003/4	Lab Control Sample	Total/NA	Water	8260B	
240-70706-2 MS	W-161010-PS-02	Total/NA	Water	8260B	
240-70706-2 MSD	W-161010-PS-02	Total/NA	Water	8260B	

GC/MS Semi VOA

Prep Batch: 251667

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70706-1	W-161010-PS-01	Total/NA	Water	3510C	
240-70706-3	W-161010-PS-03	Total/NA	Water	3510C	
240-70706-4	W-161010-PS-04	Total/NA	Water	3510C	
240-70706-5	W-161010-PS-05	Total/NA	Water	3510C	
240-70706-6	W-161010-PS-06	Total/NA	Water	3510C	
MB 240-251667/22-A	Method Blank	Total/NA	Water	3510C	
LCS 240-251667/23-A	Lab Control Sample	Total/NA	Water	3510C	

Prep Batch: 251757

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70706-2	W-161010-PS-02	Total/NA	Water	3510C	
240-70706-7	W-161011-PS-07	Total/NA	Water	3510C	
240-70706-8	W-161011-PS-08	Total/NA	Water	3510C	
240-70706-9	W-161011-PS-09	Total/NA	Water	3510C	
MB 240-251757/23-A	Method Blank	Total/NA	Water	3510C	
LCS 240-251757/24-A	Lab Control Sample	Total/NA	Water	3510C	
240-70706-2 MS	W-161010-PS-02	Total/NA	Water	3510C	
240-70706-2 MSD	W-161010-PS-02	Total/NA	Water	3510C	

Analysis Batch: 251864

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70706-1	W-161010-PS-01	Total/NA	Water	8270C	251667
240-70706-4	W-161010-PS-04	Total/NA	Water	8270C	251667
240-70706-5	W-161010-PS-05	Total/NA	Water	8270C	251667
240-70706-6	W-161010-PS-06	Total/NA	Water	8270C	251667
MB 240-251667/22-A	Method Blank	Total/NA	Water	8270C	251667
LCS 240-251667/23-A	Lab Control Sample	Total/NA	Water	8270C	251667

Prep Batch: 251958

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70706-10	W-161011-PS-10	Total/NA	Water	3510C	

TestAmerica Canton

QC Association Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

GC/MS Semi VOA (Continued)

Prep Batch: 251958 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 240-251958/18-A	Method Blank	Total/NA	Water	3510C	
LCS 240-251958/19-A	Lab Control Sample	Total/NA	Water	3510C	

Analysis Batch: 252060

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 240-251757/23-A	Method Blank	Total/NA	Water	8270C	251757
LCS 240-251757/24-A	Lab Control Sample	Total/NA	Water	8270C	251757

Analysis Batch: 252250

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70706-2	W-161010-PS-02	Total/NA	Water	8270C	251757
240-70706-7	W-161011-PS-07	Total/NA	Water	8270C	251757
240-70706-8	W-161011-PS-08	Total/NA	Water	8270C	251757
240-70706-9	W-161011-PS-09	Total/NA	Water	8270C	251757
240-70706-2 MS	W-161010-PS-02	Total/NA	Water	8270C	251757
240-70706-2 MSD	W-161010-PS-02	Total/NA	Water	8270C	251757

Analysis Batch: 252258

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 240-251958/18-A	Method Blank	Total/NA	Water	8270C	251958
LCS 240-251958/19-A	Lab Control Sample	Total/NA	Water	8270C	251958

Analysis Batch: 252265

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70706-3	W-161010-PS-03	Total/NA	Water	8270C	251667

Analysis Batch: 252448

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70706-10	W-161011-PS-10	Total/NA	Water	8270C	251958

GC VOA

Analysis Batch: 252645

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70706-2	W-161010-PS-02	Total/NA	Water	RSK-175	
240-70706-3	W-161010-PS-03	Total/NA	Water	RSK-175	
240-70706-4	W-161010-PS-04	Total/NA	Water	RSK-175	
240-70706-5	W-161010-PS-05	Total/NA	Water	RSK-175	
240-70706-6	W-161010-PS-06	Total/NA	Water	RSK-175	
240-70706-7	W-161011-PS-07	Total/NA	Water	RSK-175	
240-70706-8	W-161011-PS-08	Total/NA	Water	RSK-175	
240-70706-9	W-161011-PS-09	Total/NA	Water	RSK-175	
240-70706-10	W-161011-PS-10	Total/NA	Water	RSK-175	
MB 240-252645/4	Method Blank	Total/NA	Water	RSK-175	
LCS 240-252645/5	Lab Control Sample	Total/NA	Water	RSK-175	
240-70706-2 MS	W-161010-PS-02	Total/NA	Water	RSK-175	
240-70706-2 MSD	W-161010-PS-02	Total/NA	Water	RSK-175	

TestAmerica Canton

QC Association Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

GC Semi VOA

Prep Batch: 191291

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70706-1	W-161010-PS-01	Total/NA	Water	8151A	
240-70706-2	W-161010-PS-02	Total/NA	Water	8151A	
240-70706-3	W-161010-PS-03	Total/NA	Water	8151A	
240-70706-4	W-161010-PS-04	Total/NA	Water	8151A	
240-70706-5	W-161010-PS-05	Total/NA	Water	8151A	
240-70706-6	W-161010-PS-06	Total/NA	Water	8151A	
240-70706-7	W-161011-PS-07	Total/NA	Water	8151A	
240-70706-8	W-161011-PS-08	Total/NA	Water	8151A	
240-70706-9	W-161011-PS-09	Total/NA	Water	8151A	
240-70706-10	W-161011-PS-10	Total/NA	Water	8151A	
MB 180-191291/1-A	Method Blank	Total/NA	Water	8151A	
LCS 180-191291/2-A	Lab Control Sample	Total/NA	Water	8151A	
240-70706-2 MS	W-161010-PS-02	Total/NA	Water	8151A	
240-70706-2 MSD	W-161010-PS-02	Total/NA	Water	8151A	

Analysis Batch: 191929

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70706-1	W-161010-PS-01	Total/NA	Water	8151A	191291
240-70706-2	W-161010-PS-02	Total/NA	Water	8151A	191291
240-70706-5	W-161010-PS-05	Total/NA	Water	8151A	191291
240-70706-6	W-161010-PS-06	Total/NA	Water	8151A	191291
240-70706-7	W-161011-PS-07	Total/NA	Water	8151A	191291
240-70706-8	W-161011-PS-08	Total/NA	Water	8151A	191291
240-70706-9	W-161011-PS-09	Total/NA	Water	8151A	191291
240-70706-10	W-161011-PS-10	Total/NA	Water	8151A	191291
MB 180-191291/1-A	Method Blank	Total/NA	Water	8151A	191291
LCS 180-191291/2-A	Lab Control Sample	Total/NA	Water	8151A	191291
240-70706-2 MS	W-161010-PS-02	Total/NA	Water	8151A	191291
240-70706-2 MSD	W-161010-PS-02	Total/NA	Water	8151A	191291

Analysis Batch: 192136

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70706-3	W-161010-PS-03	Total/NA	Water	8151A	191291
240-70706-4	W-161010-PS-04	Total/NA	Water	8151A	191291

Metals

Prep Batch: 251212

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70706-1	W-161010-PS-01	Dissolved	Water	3005A	
240-70706-2	W-161010-PS-02	Dissolved	Water	3005A	
240-70706-3	W-161010-PS-03	Dissolved	Water	3005A	
240-70706-4	W-161010-PS-04	Dissolved	Water	3005A	
240-70706-5	W-161010-PS-05	Dissolved	Water	3005A	
240-70706-6	W-161010-PS-06	Dissolved	Water	3005A	
240-70706-7	W-161011-PS-07	Dissolved	Water	3005A	
240-70706-8	W-161011-PS-08	Dissolved	Water	3005A	
240-70706-9	W-161011-PS-09	Dissolved	Water	3005A	
240-70706-10	W-161011-PS-10	Dissolved	Water	3005A	
MB 240-251212/1-A	Method Blank	Total Recoverable	Water	3005A	

TestAmerica Canton

QC Association Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Metals (Continued)

Prep Batch: 251212 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 240-251212/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
240-70706-2 MS	W-161010-PS-02	Dissolved	Water	3005A	
240-70706-2 MSD	W-161010-PS-02	Dissolved	Water	3005A	

Analysis Batch: 252428

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70706-1	W-161010-PS-01	Dissolved	Water	6020	251212
240-70706-2	W-161010-PS-02	Dissolved	Water	6020	251212
240-70706-3	W-161010-PS-03	Dissolved	Water	6020	251212
240-70706-4	W-161010-PS-04	Dissolved	Water	6020	251212
240-70706-5	W-161010-PS-05	Dissolved	Water	6020	251212
240-70706-6	W-161010-PS-06	Dissolved	Water	6020	251212
240-70706-7	W-161011-PS-07	Dissolved	Water	6020	251212
240-70706-8	W-161011-PS-08	Dissolved	Water	6020	251212
240-70706-9	W-161011-PS-09	Dissolved	Water	6020	251212
240-70706-10	W-161011-PS-10	Dissolved	Water	6020	251212
MB 240-251212/1-A	Method Blank	Total Recoverable	Water	6020	251212
LCS 240-251212/2-A	Lab Control Sample	Total Recoverable	Water	6020	251212
240-70706-2 MS	W-161010-PS-02	Dissolved	Water	6020	251212
240-70706-2 MSD	W-161010-PS-02	Dissolved	Water	6020	251212

General Chemistry

Analysis Batch: 250846

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70706-2	W-161010-PS-02	Total/NA	Water	300.0	
240-70706-3	W-161010-PS-03	Total/NA	Water	300.0	
240-70706-4	W-161010-PS-04	Total/NA	Water	300.0	
240-70706-5	W-161010-PS-05	Total/NA	Water	300.0	
240-70706-6	W-161010-PS-06	Total/NA	Water	300.0	
240-70706-7	W-161011-PS-07	Total/NA	Water	300.0	
240-70706-8	W-161011-PS-08	Total/NA	Water	300.0	
240-70706-9	W-161011-PS-09	Total/NA	Water	300.0	
240-70706-10	W-161011-PS-10	Total/NA	Water	300.0	
MB 240-250846/27	Method Blank	Total/NA	Water	300.0	
MB 240-250846/3	Method Blank	Total/NA	Water	300.0	
LCS 240-250846/28	Lab Control Sample	Total/NA	Water	300.0	
LCS 240-250846/4	Lab Control Sample	Total/NA	Water	300.0	
240-70706-2 MS	W-161010-PS-02	Total/NA	Water	300.0	
240-70706-2 MSD	W-161010-PS-02	Total/NA	Water	300.0	

Analysis Batch: 251049

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70706-2	W-161010-PS-02	Total/NA	Water	300.0	
240-70706-3	W-161010-PS-03	Total/NA	Water	300.0	
240-70706-4	W-161010-PS-04	Total/NA	Water	300.0	
240-70706-5	W-161010-PS-05	Total/NA	Water	300.0	
240-70706-6	W-161010-PS-06	Total/NA	Water	300.0	
240-70706-7	W-161011-PS-07	Total/NA	Water	300.0	
240-70706-8	W-161011-PS-08	Total/NA	Water	300.0	

TestAmerica Canton

QC Association Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

General Chemistry (Continued)

Analysis Batch: 251049 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70706-9	W-161011-PS-09	Total/NA	Water	300.0	
240-70706-10	W-161011-PS-10	Total/NA	Water	300.0	
MB 240-251049/27	Method Blank	Total/NA	Water	300.0	
LCS 240-251049/28	Lab Control Sample	Total/NA	Water	300.0	
240-70706-2 MS	W-161010-PS-02	Total/NA	Water	300.0	
240-70706-2 MSD	W-161010-PS-02	Total/NA	Water	300.0	

Analysis Batch: 251349

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70706-2	W-161010-PS-02	Total/NA	Water	9060	
240-70706-3	W-161010-PS-03	Total/NA	Water	9060	
240-70706-4	W-161010-PS-04	Total/NA	Water	9060	
240-70706-5	W-161010-PS-05	Total/NA	Water	9060	
240-70706-6	W-161010-PS-06	Total/NA	Water	9060	
240-70706-7	W-161011-PS-07	Total/NA	Water	9060	
240-70706-8	W-161011-PS-08	Total/NA	Water	9060	
240-70706-9	W-161011-PS-09	Total/NA	Water	9060	
240-70706-10	W-161011-PS-10	Total/NA	Water	9060	
MB 240-251349/4	Method Blank	Total/NA	Water	9060	
LCS 240-251349/6	Lab Control Sample	Total/NA	Water	9060	
LLCS 240-251349/5	Lab Control Sample	Total/NA	Water	9060	
240-70706-2 MS	W-161010-PS-02	Total/NA	Water	9060	
240-70706-2 MSD	W-161010-PS-02	Total/NA	Water	9060	

Analysis Batch: 251399

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70706-2	W-161010-PS-02	Total/NA	Water	2340C-1997	
240-70706-3	W-161010-PS-03	Total/NA	Water	2340C-1997	
240-70706-4	W-161010-PS-04	Total/NA	Water	2340C-1997	
240-70706-5	W-161010-PS-05	Total/NA	Water	2340C-1997	
240-70706-6	W-161010-PS-06	Total/NA	Water	2340C-1997	
240-70706-7	W-161011-PS-07	Total/NA	Water	2340C-1997	
240-70706-8	W-161011-PS-08	Total/NA	Water	2340C-1997	
240-70706-9	W-161011-PS-09	Total/NA	Water	2340C-1997	
240-70706-10	W-161011-PS-10	Total/NA	Water	2340C-1997	
MB 240-251399/1	Method Blank	Total/NA	Water	2340C-1997	
LCS 240-251399/2	Lab Control Sample	Total/NA	Water	2340C-1997	
240-70706-2 MS	W-161010-PS-02	Total/NA	Water	2340C-1997	
240-70706-2 MSD	W-161010-PS-02	Total/NA	Water	2340C-1997	
240-70706-2 DU	W-161010-PS-02	Total/NA	Water	2340C-1997	
240-70706-3 DU	W-161010-PS-03	Total/NA	Water	2340C-1997	

Analysis Batch: 251493

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70706-2	W-161010-PS-02	Total/NA	Water	300.0	
240-70706-6	W-161010-PS-06	Total/NA	Water	300.0	
MB 240-251493/3	Method Blank	Total/NA	Water	300.0	
LCS 240-251493/4	Lab Control Sample	Total/NA	Water	300.0	
240-70706-2 MS	W-161010-PS-02	Total/NA	Water	300.0	
240-70706-2 MSD	W-161010-PS-02	Total/NA	Water	300.0	

TestAmerica Canton

QC Association Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

General Chemistry (Continued)

Analysis Batch: 252082

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70706-2	W-161010-PS-02	Total/NA	Water	2320B-1997	
240-70706-3	W-161010-PS-03	Total/NA	Water	2320B-1997	
240-70706-4	W-161010-PS-04	Total/NA	Water	2320B-1997	
240-70706-5	W-161010-PS-05	Total/NA	Water	2320B-1997	
240-70706-6	W-161010-PS-06	Total/NA	Water	2320B-1997	
240-70706-7	W-161011-PS-07	Total/NA	Water	2320B-1997	
240-70706-8	W-161011-PS-08	Total/NA	Water	2320B-1997	
240-70706-9	W-161011-PS-09	Total/NA	Water	2320B-1997	
240-70706-10	W-161011-PS-10	Total/NA	Water	2320B-1997	
MB 240-252082/30	Method Blank	Total/NA	Water	2320B-1997	
MB 240-252082/5	Method Blank	Total/NA	Water	2320B-1997	
LCS 240-252082/29	Lab Control Sample	Total/NA	Water	2320B-1997	
LCS 240-252082/4	Lab Control Sample	Total/NA	Water	2320B-1997	
240-70706-2 MS	W-161010-PS-02	Total/NA	Water	2320B-1997	
240-70706-2 MSD	W-161010-PS-02	Total/NA	Water	2320B-1997	
240-70706-2 DU	W-161010-PS-02	Total/NA	Water	2320B-1997	
240-70706-4 DU	W-161010-PS-04	Total/NA	Water	2320B-1997	

Lab Chronicle

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Client Sample ID: W-161010-PS-01

Date Collected: 10/10/16 10:30

Date Received: 10/12/16 09:20

Lab Sample ID: 240-70706-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	252003	10/18/16 17:42	LRW	TAL CAN
Total/NA	Prep	3510C			251667	10/17/16 08:33	CS	TAL CAN
Total/NA	Analysis	8270C		1	251864	10/18/16 19:32	JMG	TAL CAN
Total/NA	Prep	8151A			191291	10/15/16 10:30	CBY	TAL PIT
Total/NA	Analysis	8151A		4	191929	10/21/16 12:53	JMO	TAL PIT
Dissolved	Prep	3005A			251212	10/13/16 14:00	AJC	TAL CAN
Dissolved	Analysis	6020		1	252428	10/21/16 00:30	AS1	TAL CAN

Client Sample ID: W-161010-PS-02

Date Collected: 10/10/16 12:40

Date Received: 10/12/16 09:20

Lab Sample ID: 240-70706-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	252003	10/19/16 00:38	LRW	TAL CAN
Total/NA	Prep	3510C			251757	10/17/16 12:43	JDR	TAL CAN
Total/NA	Analysis	8270C		1	252250	10/20/16 11:29	MRU	TAL CAN
Total/NA	Analysis	RSK-175		1	252645	10/23/16 16:51	BPM	TAL CAN
Total/NA	Prep	8151A			191291	10/15/16 10:30	CBY	TAL PIT
Total/NA	Analysis	8151A		4	191929	10/21/16 13:17	JMO	TAL PIT
Dissolved	Prep	3005A			251212	10/13/16 14:00	AJC	TAL CAN
Dissolved	Analysis	6020		1	252428	10/20/16 23:52	AS1	TAL CAN
Total/NA	Analysis	2320B-1997		1	252082	10/18/16 17:50	LKG	TAL CAN
Total/NA	Analysis	2340C-1997		1	251399	10/14/16 08:07	TPH	TAL CAN
Total/NA	Analysis	300.0		1	250846	10/12/16 14:01	LCN	TAL CAN
Total/NA	Analysis	300.0		1	251049	10/12/16 14:01	LCN	TAL CAN
Total/NA	Analysis	300.0		1	251493	10/16/16 01:20	LKG	TAL CAN
Total/NA	Analysis	9060		1	251349	10/13/16 20:25	TPH	TAL CAN

Client Sample ID: W-161010-PS-03

Date Collected: 10/10/16 14:05

Date Received: 10/12/16 09:20

Lab Sample ID: 240-70706-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	252003	10/18/16 18:04	LRW	TAL CAN
Total/NA	Prep	3510C			251667	10/17/16 08:33	CS	TAL CAN
Total/NA	Analysis	8270C		1	252265	10/20/16 11:38	JMG	TAL CAN
Total/NA	Analysis	RSK-175		1	252645	10/23/16 17:43	BPM	TAL CAN
Total/NA	Prep	8151A			191291	10/15/16 10:30	CBY	TAL PIT
Total/NA	Analysis	8151A		50	192136	10/24/16 12:02	JMO	TAL PIT
Dissolved	Prep	3005A			251212	10/13/16 14:00	AJC	TAL CAN
Dissolved	Analysis	6020		1	252428	10/21/16 00:35	AS1	TAL CAN
Total/NA	Analysis	2320B-1997		1	252082	10/18/16 18:41	LKG	TAL CAN

TestAmerica Canton

Lab Chronicle

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Client Sample ID: W-161010-PS-03

Lab Sample ID: 240-70706-3

Date Collected: 10/10/16 14:05

Matrix: Water

Date Received: 10/12/16 09:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2340C-1997		1	251399	10/14/16 08:40	TPH	TAL CAN
Total/NA	Analysis	300.0		1	250846	10/12/16 13:00	LCN	TAL CAN
Total/NA	Analysis	300.0		1	251049	10/12/16 13:00	LCN	TAL CAN
Total/NA	Analysis	9060		1	251349	10/13/16 22:52	TPH	TAL CAN

Client Sample ID: W-161010-PS-04

Lab Sample ID: 240-70706-4

Date Collected: 10/10/16 14:45

Matrix: Water

Date Received: 10/12/16 09:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	252003	10/18/16 18:26	LRW	TAL CAN
Total/NA	Prep	3510C			251667	10/17/16 08:33	CS	TAL CAN
Total/NA	Analysis	8270C		1	251864	10/18/16 13:17	JMG	TAL CAN
Total/NA	Analysis	RSK-175		1	252645	10/23/16 18:00	BPM	TAL CAN
Total/NA	Prep	8151A			191291	10/15/16 10:30	CBY	TAL PIT
Total/NA	Analysis	8151A		4	192136	10/24/16 12:49	JMO	TAL PIT
Dissolved	Prep	3005A			251212	10/13/16 14:00	AJC	TAL CAN
Dissolved	Analysis	6020		1	252428	10/21/16 00:39	AS1	TAL CAN
Total/NA	Analysis	2320B-1997		1	252082	10/18/16 19:13	LKG	TAL CAN
Total/NA	Analysis	2340C-1997		1	251399	10/14/16 08:42	TPH	TAL CAN
Total/NA	Analysis	300.0		1	250846	10/12/16 13:20	LCN	TAL CAN
Total/NA	Analysis	300.0		1	251049	10/12/16 13:20	LCN	TAL CAN
Total/NA	Analysis	9060		1	251349	10/13/16 23:19	TPH	TAL CAN

Client Sample ID: W-161010-PS-05

Lab Sample ID: 240-70706-5

Date Collected: 10/10/16 15:55

Matrix: Water

Date Received: 10/12/16 09:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	252003	10/18/16 18:47	LRW	TAL CAN
Total/NA	Prep	3510C			251667	10/17/16 08:33	CS	TAL CAN
Total/NA	Analysis	8270C		1	251864	10/18/16 13:40	JMG	TAL CAN
Total/NA	Analysis	RSK-175		1	252645	10/23/16 18:17	BPM	TAL CAN
Total/NA	Prep	8151A			191291	10/15/16 10:30	CBY	TAL PIT
Total/NA	Analysis	8151A		4	191929	10/21/16 15:17	JMO	TAL PIT
Dissolved	Prep	3005A			251212	10/13/16 14:00	AJC	TAL CAN
Dissolved	Analysis	6020		1	252428	10/21/16 00:43	AS1	TAL CAN
Total/NA	Analysis	2320B-1997		1	252082	10/18/16 19:29	LKG	TAL CAN
Total/NA	Analysis	2340C-1997		1	251399	10/14/16 08:45	TPH	TAL CAN
Total/NA	Analysis	300.0		1	250846	10/12/16 16:02	LCN	TAL CAN
Total/NA	Analysis	300.0		1	251049	10/12/16 16:02	LCN	TAL CAN

TestAmerica Canton

Lab Chronicle

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Client Sample ID: W-161010-PS-05

Lab Sample ID: 240-70706-5

Date Collected: 10/10/16 15:55

Matrix: Water

Date Received: 10/12/16 09:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9060		1	251349	10/13/16 23:46	TPH	TAL CAN

Client Sample ID: W-161010-PS-06

Lab Sample ID: 240-70706-6

Date Collected: 10/10/16 16:00

Matrix: Water

Date Received: 10/12/16 09:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	252003	10/18/16 19:09	LRW	TAL CAN
Total/NA	Prep	3510C			251667	10/17/16 08:33	CS	TAL CAN
Total/NA	Analysis	8270C		1	251864	10/18/16 14:04	JMG	TAL CAN
Total/NA	Analysis	RSK-175		1	252645	10/23/16 18:34	BPM	TAL CAN
Total/NA	Prep	8151A			191291	10/15/16 10:30	CBY	TAL PIT
Total/NA	Analysis	8151A		4	191929	10/21/16 15:41	JMO	TAL PIT
Dissolved	Prep	3005A			251212	10/13/16 14:00	AJC	TAL CAN
Dissolved	Analysis	6020		1	252428	10/21/16 00:48	AS1	TAL CAN
Total/NA	Analysis	2320B-1997		1	252082	10/18/16 19:37	LKG	TAL CAN
Total/NA	Analysis	2340C-1997		1	251399	10/14/16 08:47	TPH	TAL CAN
Total/NA	Analysis	300.0		1	250846	10/12/16 13:41	LCN	TAL CAN
Total/NA	Analysis	300.0		1	251049	10/12/16 13:41	LCN	TAL CAN
Total/NA	Analysis	300.0		1	251493	10/16/16 00:19	LKG	TAL CAN
Total/NA	Analysis	9060		1	251349	10/14/16 00:13	TPH	TAL CAN

Client Sample ID: W-161011-PS-07

Lab Sample ID: 240-70706-7

Date Collected: 10/11/16 09:35

Matrix: Water

Date Received: 10/12/16 09:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	252003	10/18/16 19:31	LRW	TAL CAN
Total/NA	Prep	3510C			251757	10/17/16 12:43	JDR	TAL CAN
Total/NA	Analysis	8270C		1	252250	10/20/16 12:45	MRU	TAL CAN
Total/NA	Analysis	RSK-175		1	252645	10/23/16 18:51	BPM	TAL CAN
Total/NA	Prep	8151A			191291	10/15/16 10:30	CBY	TAL PIT
Total/NA	Analysis	8151A		4	191929	10/21/16 16:52	JMO	TAL PIT
Dissolved	Prep	3005A			251212	10/13/16 14:00	AJC	TAL CAN
Dissolved	Analysis	6020		1	252428	10/21/16 00:52	AS1	TAL CAN
Total/NA	Analysis	2320B-1997		1	252082	10/18/16 19:47	LKG	TAL CAN
Total/NA	Analysis	2340C-1997		1	251399	10/14/16 08:50	TPH	TAL CAN
Total/NA	Analysis	300.0		1	250846	10/12/16 16:22	LCN	TAL CAN
Total/NA	Analysis	300.0		1	251049	10/12/16 16:22	LCN	TAL CAN
Total/NA	Analysis	9060		1	251349	10/14/16 00:40	TPH	TAL CAN

TestAmerica Canton

Lab Chronicle

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Client Sample ID: W-161011-PS-08

Lab Sample ID: 240-70706-8

Date Collected: 10/11/16 10:25

Matrix: Water

Date Received: 10/12/16 09:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	252003	10/18/16 19:53	LRW	TAL CAN
Total/NA	Prep	3510C			251757	10/17/16 12:43	JDR	TAL CAN
Total/NA	Analysis	8270C		1	252250	10/20/16 13:10	MRU	TAL CAN
Total/NA	Analysis	RSK-175		1	252645	10/23/16 19:25	BPM	TAL CAN
Total/NA	Prep	8151A			191291	10/15/16 10:30	CBY	TAL PIT
Total/NA	Analysis	8151A		4	191929	10/21/16 17:16	JMO	TAL PIT
Dissolved	Prep	3005A			251212	10/13/16 14:00	AJC	TAL CAN
Dissolved	Analysis	6020		1	252428	10/21/16 00:56	AS1	TAL CAN
Total/NA	Analysis	2320B-1997		1	252082	10/18/16 19:58	LKG	TAL CAN
Total/NA	Analysis	2340C-1997		1	251399	10/14/16 08:52	TPH	TAL CAN
Total/NA	Analysis	300.0		1	250846	10/12/16 16:42	LCN	TAL CAN
Total/NA	Analysis	300.0		1	251049	10/12/16 16:42	LCN	TAL CAN
Total/NA	Analysis	9060		1	251349	10/14/16 01:06	TPH	TAL CAN

Client Sample ID: W-161011-PS-09

Lab Sample ID: 240-70706-9

Date Collected: 10/11/16 11:20

Matrix: Water

Date Received: 10/12/16 09:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	252003	10/18/16 20:15	LRW	TAL CAN
Total/NA	Prep	3510C			251757	10/17/16 12:43	JDR	TAL CAN
Total/NA	Analysis	8270C		1	252250	10/20/16 13:35	MRU	TAL CAN
Total/NA	Analysis	RSK-175		1	252645	10/23/16 19:42	BPM	TAL CAN
Total/NA	Prep	8151A			191291	10/15/16 10:30	CBY	TAL PIT
Total/NA	Analysis	8151A		4	191929	10/21/16 17:40	JMO	TAL PIT
Dissolved	Prep	3005A			251212	10/13/16 14:00	AJC	TAL CAN
Dissolved	Analysis	6020		1	252428	10/21/16 01:01	AS1	TAL CAN
Total/NA	Analysis	2320B-1997		1	252082	10/18/16 20:06	LKG	TAL CAN
Total/NA	Analysis	2340C-1997		1	251399	10/14/16 08:55	TPH	TAL CAN
Total/NA	Analysis	300.0		1	250846	10/12/16 17:02	LCN	TAL CAN
Total/NA	Analysis	300.0		1	251049	10/12/16 17:02	LCN	TAL CAN
Total/NA	Analysis	9060		1	251349	10/14/16 01:34	TPH	TAL CAN

Client Sample ID: W-161011-PS-10

Lab Sample ID: 240-70706-10

Date Collected: 10/11/16 12:15

Matrix: Water

Date Received: 10/12/16 09:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	252003	10/18/16 20:37	LRW	TAL CAN
Total/NA	Prep	3510C			251958	10/18/16 12:10	CS	TAL CAN
Total/NA	Analysis	8270C		1	252448	10/21/16 11:25	JMG	TAL CAN
Total/NA	Analysis	RSK-175		1	252645	10/23/16 19:59	BPM	TAL CAN

TestAmerica Canton

Lab Chronicle

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	8151A			191291	10/15/16 10:30	CBY	TAL PIT
Total/NA	Analysis	8151A		4	191929	10/21/16 18:04	JMO	TAL PIT
Dissolved	Prep	3005A			251212	10/13/16 14:00	AJC	TAL CAN
Dissolved	Analysis	6020		1	252428	10/21/16 01:05	AS1	TAL CAN
Total/NA	Analysis	2320B-1997		1	252082	10/18/16 20:16	LKG	TAL CAN
Total/NA	Analysis	2340C-1997		1	251399	10/14/16 08:57	TPH	TAL CAN
Total/NA	Analysis	300.0		1	250846	10/12/16 17:22	LCN	TAL CAN
Total/NA	Analysis	300.0		1	251049	10/12/16 17:22	LCN	TAL CAN
Total/NA	Analysis	9060		1	251349	10/14/16 02:01	TPH	TAL CAN

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Certification Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70706-1

Laboratory: TestAmerica Canton

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Wisconsin	State Program	5	999518190	08-31-17

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
RSK-175		Water	Methane

Laboratory: TestAmerica Pittsburgh

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Wisconsin	State Program	5	998027800	08-31-17



14/018
2.21/2.6

2.0/2.4

Chain of Custody Record

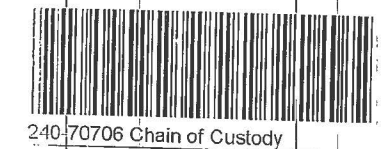
COLUMBUS

240507

Client Information	Sampler: Peter Storz	Lab PM: Heckler, Denise D	Carrier Tracking No(s):	COC No: 240-37523-16440.1
Client Contact: Mr. Grant Anderson	Phone: 651-247-4218	E-Mail: denise.heckler@testamericainc.com		Page: Page 1 of 3
Company: GHD Services Inc.				Job #:

Address: 1801 Old Highway 8 NW Suite 114	Due Date Requested:	STANDARD	Analysis Requested	
City: St. Paul	TAT Requested (days):		Field Filtered Sample (Yes or No)	Perform. MS/MSD (Yes or No)
State, Zip: MN, 55112	PO #: 34001059		2320B - Alkalinity	2340C - Hardness as calcium carbonate
Phone: 651-639-0913(Tel) 651-639-0923(Fax)	WO #: 86165		RSK_176 - Methane	9060 - TOC
Email: grant.anderson@ghd.com	Project #: 24012755	SSOW#:	300 - Nitrate, Chloride, Sulfate	
Project Name: 86165-03-11, Penta Wood				Preservation Codes:
Site:				A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA
				M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2SO4 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform. MS/MSD (Yes or No)	2320B - Alkalinity	2340C - Hardness as calcium carbonate	RSK_176 - Methane	9060 - TOC	300 - Nitrate, Chloride, Sulfate	Total Number of Containers	Special Instructions/Note
W-161010-PS-01				Water	X	X	X	X	X	X	X		
02 (MS/MSD)				Water	X	X	X	X	X	X	X		(MS/MSD)
03				Water	X	X	X	X	X	X	X		
04				Water	X	X	X	X	X	X	X		
05				Water	X	X	X	X	X	X	X		
06				Water	X	X	X	X	X	X	X		
W-161011-PS-07				Water	X	X	X	X	X	X	X		
08				Water	X	X	X	X	X	X	X		
09				Water	X	X	X	X	X	X	X		
10				Water	X	X	X	X	X	X	X		
W-161012-PS-01				Water	X	X	X	X	X	X	X		



Possible Hazard Identification	<input type="checkbox"/> Non-Hazard	<input type="checkbox"/> Flammable	<input type="checkbox"/> Skin Irritant	<input type="checkbox"/> Poison B	<input type="checkbox"/> Unknown	<input type="checkbox"/> Radiological	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)		
Deliverable Requested: I, II, III, IV, Other (specify)							<input type="checkbox"/> Return To Client	<input type="checkbox"/> Disposal By Lab	<input type="checkbox"/> Archive For _____ Months
Empty Kit Relinquished by:	Date:	Time:	Special Instructions/QC Requirements:						

Relinquished by: PS	Date/Time: 10-11-16/1600	Company: GHP	Received by: [Signature]	Date/Time: 10-11-16 0200	Company: TAC
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:			



TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 70704

Client G7 HD Site Name _____
 Cooler Received on 10/12/16 Opened on 10/12/16
 FedEx: 1st Grd Exp UPS FAS Stetson Client Drop Off TestAmerica Courier Other _____

Cooler unpacked by:
DSO

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # _____ Foam Box _____ Client Cooler Box _____ Other _____
 Packing material used: Bubble Wrap _____ Foam _____ Plastic Bag _____ None _____ Other _____
 COOLANT: Wet Ice Blue Ice _____ Dry Ice _____ Water _____ None _____

1. Cooler temperature upon receipt See Multiple Cooler Form
 IR GUN# IR-8 (CF +0.4 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
 IR GUN #36 (CF +1.3°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were custody seals on the outside of the cooler(s)? If Yes Quantity 2 each Yes No
 -Were custody seals on the outside of the cooler(s) signed & dated? Yes No NA
 -Were custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
 3. Shippers' packing slip attached to the cooler(s)? Yes No
 4. Did custody papers accompany the sample(s)? Yes No
 5. Were the custody papers relinquished & signed in the appropriate place? Yes No
 6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
 7. Did all bottles arrive in good condition (Unbroken)? Yes No
 8. Could all bottle labels be reconciled with the COC? Yes No
 9. Were correct bottle(s) used for the test(s) indicated? Yes No
 10. Sufficient quantity received to perform indicated analyses? Yes No
 11. Are these work share samples? Yes No
 If yes, Questions 11-15 have been checked at the originating laboratory.
 11. Were sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC574756
 12. Were VOAs on the COC? Yes No
 13. Were air bubbles >6 mm in any VOA vials? Yes No NA
 14. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ Yes No
 15. Was a LL Hg or Me Hg trip blank present? Yes No

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other _____

Concerning _____

14. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by: _____

Did not receive Trip Blank listed on COC.

Did not receive Bottle for NO3 Analysis for sample W-1610b-PS-01, had to split from Liter amber. Received 2 voas as well for PS-01 empty for TOC analysis.

15. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
 Sample(s) _____ were received in a broken container.
 Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

16. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
 Time preserved: _____ Preservative(s) added/Lot number(s): _____

Temperature readings: _____

<u>Client Sample ID</u>	<u>Lab ID</u>	<u>Container Type</u>	<u>Container pH</u>	<u>Preservative Added (mls)</u>	<u>Lot #</u>
W-161010-PS-01	240-70706-E-1	Plastic 500ml - with Nitric Acid			
W-161010-PS-02	240-70706-AB-2	Plastic 250ml - with Nitric Acid	<2		
W-161010-PS-02	240-70706-AC-2	Plastic 250ml - with Nitric Acid	<2		
W-161010-PS-02	240-70706-AD-2	Plastic 250ml - with Nitric Acid	<2		
W-161010-PS-02	240-70706-AH-2	Plastic 500ml - with Nitric Acid	<2		
W-161010-PS-02	240-70706-AI-2	Plastic 500ml - with Nitric Acid	<2		
W-161010-PS-02	240-70706-AJ-2	Plastic 500ml - with Nitric Acid	<2		
W-161010-PS-03	240-70706-J-3	Plastic 250ml - with Nitric Acid	<2		
W-161010-PS-03	240-70706-L-3	Plastic 500ml - with Nitric Acid	<2		

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Login Sample Receipt Checklist

Client: GHD Services Inc.

Job Number: 240-70706-1

Login Number: 70706
List Number: 2
Creator: Say, Thomas C

List Source: TestAmerica Pittsburgh
List Creation: 10/13/16 02:00 PM

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



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Canton

4101 Shuffel Street NW

North Canton, OH 44720

Tel: (330)497-9396

TestAmerica Job ID: 240-70803-1

Client Project/Site: 86165-03-11, Penta Wood

For:

GHD Services Inc.

1801 Old Highway 8 NW

Suite 114

St. Paul, Minnesota 55112

Attn: Mr. Grant Anderson



Authorized for release by:

10/27/2016 12:43:12 PM

Denise Heckler, Project Manager II

(330)966-9477

denise.heckler@testamericainc.com

LINKS

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results through

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

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

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Definitions/Glossary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
X	Surrogate is outside control limits

GC VOA

Qualifier	Qualifier Description
J	Reported value was between the limit of detection and the limit of quantitation.

GC Semi VOA

Qualifier	Qualifier Description
J	Reported value was between the limit of detection and the limit of quantitation.
p	The %RPD between the primary and confirmation column/detector is >40%. The lower value has been reported.
D	Surrogate or matrix spike recoveries were not obtained because the extract was diluted for analysis; also compounds analyzed at a dilution may be flagged with a D.
X	Surrogate is outside control limits

Metals

Qualifier	Qualifier Description
J	Reported value was between the limit of detection and the limit of quantitation.
B	Compound was found in the blank and sample.

General Chemistry

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
J	Reported value was between the limit of detection and the limit of quantitation.

Glossary

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

Case Narrative

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Job ID: 240-70803-1

Laboratory: TestAmerica Canton

Narrative

Job Narrative 240-70803-1

Comments

No additional comments.

Receipt

The samples were received on 10/13/2016 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 0.6° C and 1.6° C.

Receipt Exceptions

Method(s) 9060: Two containers for the following samples were accidentally knocked off shelf and broken. W-161012-PS-15 (240-70803-5).

GC/MS VOA

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

GC/MS Semi VOA

Method(s) 8270C: The Method Blank for batch 251667 associated with samples W-161012-PS-11 (240-70803-1), W-161012-PS-12 (240-70803-2), W-161012-PS-13 (240-70803-3), W-161012-PS-14 (240-70803-4) and W-161012-PS-15 (240-70803-5) had several surrogates out of control. Upon re-extraction and re-analysis all QC met acceptance criteria, however, sample holding times had been exceeded. Both sets of data have been reported.

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

GC VOA

Method(s) RSK-175: The matrix spike / matrix spike duplicate (MS/MSD) precision for analytical batch 240-252854 was outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) was within acceptance limits. MS recovery low. MSD and LCS passed.

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

GC Semi VOA

Method(s) 8151A: The following sample was diluted due to the abundance of target analytes: W-161012-PS-13 (240-70803-3)

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

Metals

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

General Chemistry

Method(s) 300.0: Reanalysis of the following samples was performed outside of the analytical holding time due to failure of quality control parameters in the initial analysis. W-161012-PS-13 (240-70803-3), W-161012-PS-14 (240-70803-4) and W-161012-PS-15 (240-70803-5).

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

Organic Prep

Method(s) 3510C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 240-252054.

Method(s) 3510C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 240-252470.

Case Narrative

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Job ID: 240-70803-1 (Continued)

Laboratory: TestAmerica Canton (Continued)

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

VOA Prep

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

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Method Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8270C	Semivolatile Organic Compounds (GC/MS)	SW846	TAL CAN
RSK-175	Dissolved Gases (GC)	RSK	TAL CAN
8151A	Herbicides (GC)	SW846	TAL PIT
6020	Metals (ICP/MS)	SW846	TAL CAN
2320B-1997	Alkalinity, Total	SM	TAL CAN
2340C-1997	Hardness, Total	SM	TAL CAN
300.0	Anions, Ion Chromatography	MCAWW	TAL CAN
9060	Organic Carbon, Total (TOC)	SW846	TAL CAN

Protocol References:

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

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

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

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

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-70803-1	W-161012-PS-11	Water	10/12/16 10:00	10/13/16 09:30
240-70803-2	W-161012-PS-12	Water	10/12/16 11:05	10/13/16 09:30
240-70803-3	W-161012-PS-13	Water	10/12/16 11:40	10/13/16 09:30
240-70803-4	W-161012-PS-14	Water	10/12/16 11:40	10/13/16 09:30
240-70803-5	W-161012-PS-15	Water	10/12/16 12:45	10/13/16 09:30
240-70803-6	TRIP BLANK 002	Water	10/12/16 14:00	10/13/16 09:30

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Detection Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Client Sample ID: W-161012-PS-11

Lab Sample ID: 240-70803-1

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Methane	0.16	J	0.50	0.080	ug/L	1		RSK-175	Total/NA
Pentachlorophenol	0.12		0.094	0.015	ug/L	4		8151A	Total/NA
Arsenic	0.46	J	5.0	0.35	ug/L	1		6020	Dissolved
Copper	0.67	J B	2.0	0.36	ug/L	1		6020	Dissolved
Manganese	0.96	J B	5.0	0.25	ug/L	1		6020	Dissolved
Alkalinity	86.2		5.0	1.9	mg/L	1		2320B-1997	Total/NA
Hardness as calcium carbonate	92.0		5.0	3.1	mg/L	1		2340C-1997	Total/NA
Chloride	7.5		1.0	0.41	mg/L	1		300.0	Total/NA
Sulfate	5.2		1.0	0.13	mg/L	1		300.0	Total/NA
Total Organic Carbon	0.59	J	1.0	0.080	mg/L	1		9060	Total/NA
Nitrate as N - RA	0.45	H	0.10	0.035	mg/L	1		300.0	Total/NA

Client Sample ID: W-161012-PS-12

Lab Sample ID: 240-70803-2

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Pentachlorophenol	0.043	J p	0.097	0.015	ug/L	4		8151A	Total/NA
Arsenic	0.41	J	5.0	0.35	ug/L	1		6020	Dissolved
Copper	1.7	J B	2.0	0.36	ug/L	1		6020	Dissolved
Iron	85.4	J B	100	5.3	ug/L	1		6020	Dissolved
Manganese	5.4	B	5.0	0.25	ug/L	1		6020	Dissolved
Alkalinity	67.2		5.0	1.9	mg/L	1		2320B-1997	Total/NA
Hardness as calcium carbonate	70.0		5.0	3.1	mg/L	1		2340C-1997	Total/NA
Chloride	1.7		1.0	0.41	mg/L	1		300.0	Total/NA
Sulfate	3.5		1.0	0.13	mg/L	1		300.0	Total/NA
Total Organic Carbon	0.96	J	1.0	0.080	mg/L	1		9060	Total/NA
Nitrate as N - RA	0.53	H	0.10	0.035	mg/L	1		300.0	Total/NA

Client Sample ID: W-161012-PS-13

Lab Sample ID: 240-70803-3

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Methane	0.092	J	0.50	0.080	ug/L	1		RSK-175	Total/NA
Pentachlorophenol	14		12	1.9	ug/L	500		8151A	Total/NA
Arsenic	0.50	J	5.0	0.35	ug/L	1		6020	Dissolved
Copper	1.6	J B	2.0	0.36	ug/L	1		6020	Dissolved
Iron	10	J B	100	5.3	ug/L	1		6020	Dissolved
Manganese	439	B	5.0	0.25	ug/L	1		6020	Dissolved
Alkalinity	239		5.0	1.9	mg/L	1		2320B-1997	Total/NA
Hardness as calcium carbonate	340		5.0	3.1	mg/L	1		2340C-1997	Total/NA
Chloride	10.8		1.0	0.41	mg/L	1		300.0	Total/NA
Sulfate	124		1.0	0.13	mg/L	1		300.0	Total/NA
Total Organic Carbon	0.71	J	1.0	0.080	mg/L	1		9060	Total/NA
Nitrate as N - RA	1.2	H	0.10	0.035	mg/L	1		300.0	Total/NA

Client Sample ID: W-161012-PS-14

Lab Sample ID: 240-70803-4

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Pentachlorophenol	0.18		0.095	0.015	ug/L	4		8151A	Total/NA
Arsenic	0.40	J	5.0	0.35	ug/L	1		6020	Dissolved
Copper	1.7	J B	2.0	0.36	ug/L	1		6020	Dissolved
Iron	61.7	J B	100	5.3	ug/L	1		6020	Dissolved

This Detection Summary does not include radiochemical test results.

TestAmerica Canton

Detection Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Client Sample ID: W-161012-PS-14 (Continued)

Lab Sample ID: 240-70803-4

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Manganese	5.3	B	5.0	0.25	ug/L	1		6020	Dissolved
Alkalinity	33.1		5.0	1.9	mg/L	1		2320B-1997	Total/NA
Hardness as calcium carbonate	24.0		5.0	3.1	mg/L	1		2340C-1997	Total/NA
Chloride	2.4		1.0	0.41	mg/L	1		300.0	Total/NA
Sulfate	2.2		1.0	0.13	mg/L	1		300.0	Total/NA
Total Organic Carbon	0.58	J	1.0	0.080	mg/L	1		9060	Total/NA
Nitrate as N - RA	0.30	H	0.10	0.035	mg/L	1		300.0	Total/NA

Client Sample ID: W-161012-PS-15

Lab Sample ID: 240-70803-5

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Methane	0.084	J	0.50	0.080	ug/L	1		RSK-175	Total/NA
Pentachlorophenol	3.8		0.095	0.015	ug/L	4		8151A	Total/NA
Copper	1.1	J B	2.0	0.36	ug/L	1		6020	Dissolved
Iron	13.8	J B	100	5.3	ug/L	1		6020	Dissolved
Manganese	67.3	B	5.0	0.25	ug/L	1		6020	Dissolved
Alkalinity	52.2		5.0	1.9	mg/L	1		2320B-1997	Total/NA
Hardness as calcium carbonate	86.0		5.0	3.1	mg/L	1		2340C-1997	Total/NA
Chloride	3.8		1.0	0.41	mg/L	1		300.0	Total/NA
Sulfate	30.5		1.0	0.13	mg/L	1		300.0	Total/NA
Nitrate as N - RA	1.6	H	0.10	0.035	mg/L	1		300.0	Total/NA

Client Sample ID: TRIP BLANK 002

Lab Sample ID: 240-70803-6

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Canton

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Client Sample ID: W-161012-PS-11

Lab Sample ID: 240-70803-1

Date Collected: 10/12/16 10:00

Matrix: Water

Date Received: 10/13/16 09:30

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/20/16 01:16	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/20/16 01:16	1
Toluene	<0.23		1.0	0.23	ug/L			10/20/16 01:16	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/20/16 01:16	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	100		63 - 132		10/20/16 01:16	1
4-Bromofluorobenzene (Surr)	85		73 - 120		10/20/16 01:16	1
Toluene-d8 (Surr)	90		73 - 124		10/20/16 01:16	1
Dibromofluoromethane (Surr)	86		80 - 120		10/20/16 01:16	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.060		0.19	0.060	ug/L		10/19/16 06:19	10/20/16 20:13	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	64		42 - 120	10/19/16 06:19	10/20/16 20:13	1
2-Fluorophenol (Surr)	27		10 - 120	10/19/16 06:19	10/20/16 20:13	1
2,4,6-Tribromophenol (Surr)	61		35 - 125	10/19/16 06:19	10/20/16 20:13	1
Nitrobenzene-d5 (Surr)	62		36 - 120	10/19/16 06:19	10/20/16 20:13	1
Phenol-d5 (Surr)	16		10 - 120	10/19/16 06:19	10/20/16 20:13	1
Terphenyl-d14 (Surr)	61		17 - 120	10/19/16 06:19	10/20/16 20:13	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS) - RE

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	69		42 - 120	10/21/16 09:29	10/24/16 17:16	1
2-Fluorophenol (Surr)	28		10 - 120	10/21/16 09:29	10/24/16 17:16	1
2,4,6-Tribromophenol (Surr)	68		35 - 125	10/21/16 09:29	10/24/16 17:16	1
Nitrobenzene-d5 (Surr)	72		36 - 120	10/21/16 09:29	10/24/16 17:16	1
Phenol-d5 (Surr)	17		10 - 120	10/21/16 09:29	10/24/16 17:16	1
Terphenyl-d14 (Surr)	73		17 - 120	10/21/16 09:29	10/24/16 17:16	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	0.16	J	0.50	0.080	ug/L			10/25/16 16:04	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	81		76 - 121		10/25/16 16:04	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	0.12		0.094	0.015	ug/L		10/15/16 10:30	10/21/16 18:28	4

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	50		18 - 125	10/15/16 10:30	10/21/16 18:28	4

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.46	J	5.0	0.35	ug/L		10/14/16 14:00	10/21/16 03:30	1
Copper	0.67	J B	2.0	0.36	ug/L		10/14/16 14:00	10/21/16 03:30	1
Iron	<5.3		100	5.3	ug/L		10/14/16 14:00	10/21/16 03:30	1

TestAmerica Canton

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Client Sample ID: W-161012-PS-11

Lab Sample ID: 240-70803-1

Date Collected: 10/12/16 10:00

Matrix: Water

Date Received: 10/13/16 09:30

Method: 6020 - Metals (ICP/MS) - Dissolved (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	0.96	J B	5.0	0.25	ug/L		10/14/16 14:00	10/21/16 03:30	1
Zinc	<6.2		20.0	6.2	ug/L		10/14/16 14:00	10/21/16 03:30	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	86.2		5.0	1.9	mg/L			10/14/16 18:06	1
Hardness as calcium carbonate	92.0		5.0	3.1	mg/L			10/27/16 08:56	1
Chloride	7.5		1.0	0.41	mg/L			10/17/16 04:51	1
Sulfate	5.2		1.0	0.13	mg/L			10/17/16 04:51	1
Total Organic Carbon	0.59	J	1.0	0.080	mg/L			10/17/16 11:31	1

General Chemistry - RA

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.45	H	0.10	0.035	mg/L			10/17/16 04:51	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Client Sample ID: W-161012-PS-12

Lab Sample ID: 240-70803-2

Date Collected: 10/12/16 11:05

Matrix: Water

Date Received: 10/13/16 09:30

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/20/16 01:39	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/20/16 01:39	1
Toluene	<0.23		1.0	0.23	ug/L			10/20/16 01:39	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/20/16 01:39	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	100		63 - 132		10/20/16 01:39	1
4-Bromofluorobenzene (Surr)	84		73 - 120		10/20/16 01:39	1
Toluene-d8 (Surr)	89		73 - 124		10/20/16 01:39	1
Dibromofluoromethane (Surr)	86		80 - 120		10/20/16 01:39	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.061		0.20	0.061	ug/L		10/19/16 06:19	10/20/16 17:06	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	60		42 - 120	10/19/16 06:19	10/20/16 17:06	1
2-Fluorophenol (Surr)	25		10 - 120	10/19/16 06:19	10/20/16 17:06	1
2,4,6-Tribromophenol (Surr)	64		35 - 125	10/19/16 06:19	10/20/16 17:06	1
Nitrobenzene-d5 (Surr)	61		36 - 120	10/19/16 06:19	10/20/16 17:06	1
Phenol-d5 (Surr)	16		10 - 120	10/19/16 06:19	10/20/16 17:06	1
Terphenyl-d14 (Surr)	59		17 - 120	10/19/16 06:19	10/20/16 17:06	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS) - RE

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	66		42 - 120	10/21/16 09:29	10/24/16 12:59	1
2-Fluorophenol (Surr)	27		10 - 120	10/21/16 09:29	10/24/16 12:59	1
2,4,6-Tribromophenol (Surr)	71		35 - 125	10/21/16 09:29	10/24/16 12:59	1
Nitrobenzene-d5 (Surr)	64		36 - 120	10/21/16 09:29	10/24/16 12:59	1
Phenol-d5 (Surr)	17		10 - 120	10/21/16 09:29	10/24/16 12:59	1
Terphenyl-d14 (Surr)	66		17 - 120	10/21/16 09:29	10/24/16 12:59	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.080		0.50	0.080	ug/L			10/25/16 16:21	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	81		76 - 121		10/25/16 16:21	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	0.043	J p	0.097	0.015	ug/L		10/15/16 10:30	10/21/16 18:51	4

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	58		18 - 125	10/15/16 10:30	10/21/16 18:51	4

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.41	J	5.0	0.35	ug/L		10/14/16 14:00	10/21/16 03:34	1
Copper	1.7	J B	2.0	0.36	ug/L		10/14/16 14:00	10/21/16 03:34	1
Iron	85.4	J B	100	5.3	ug/L		10/14/16 14:00	10/21/16 03:34	1

TestAmerica Canton

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Client Sample ID: W-161012-PS-12

Lab Sample ID: 240-70803-2

Date Collected: 10/12/16 11:05

Matrix: Water

Date Received: 10/13/16 09:30

Method: 6020 - Metals (ICP/MS) - Dissolved (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	5.4	B	5.0	0.25	ug/L		10/14/16 14:00	10/21/16 03:34	1
Zinc	<6.2		20.0	6.2	ug/L		10/14/16 14:00	10/21/16 03:34	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	67.2		5.0	1.9	mg/L			10/14/16 18:15	1
Hardness as calcium carbonate	70.0		5.0	3.1	mg/L			10/27/16 09:20	1
Chloride	1.7		1.0	0.41	mg/L			10/17/16 05:11	1
Sulfate	3.5		1.0	0.13	mg/L			10/17/16 05:11	1
Total Organic Carbon	0.96	J	1.0	0.080	mg/L			10/17/16 12:17	1

General Chemistry - RA

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.53	H	0.10	0.035	mg/L			10/17/16 05:11	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Client Sample ID: W-161012-PS-13

Lab Sample ID: 240-70803-3

Date Collected: 10/12/16 11:40

Matrix: Water

Date Received: 10/13/16 09:30

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/20/16 02:01	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/20/16 02:01	1
Toluene	<0.23		1.0	0.23	ug/L			10/20/16 02:01	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/20/16 02:01	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	99		63 - 132		10/20/16 02:01	1
4-Bromofluorobenzene (Surr)	82		73 - 120		10/20/16 02:01	1
Toluene-d8 (Surr)	89		73 - 124		10/20/16 02:01	1
Dibromofluoromethane (Surr)	85		80 - 120		10/20/16 02:01	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.060		0.19	0.060	ug/L		10/19/16 06:19	10/20/16 17:30	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	67		42 - 120	10/19/16 06:19	10/20/16 17:30	1
2-Fluorophenol (Surr)	30		10 - 120	10/19/16 06:19	10/20/16 17:30	1
2,4,6-Tribromophenol (Surr)	64		35 - 125	10/19/16 06:19	10/20/16 17:30	1
Nitrobenzene-d5 (Surr)	71		36 - 120	10/19/16 06:19	10/20/16 17:30	1
Phenol-d5 (Surr)	17		10 - 120	10/19/16 06:19	10/20/16 17:30	1
Terphenyl-d14 (Surr)	69		17 - 120	10/19/16 06:19	10/20/16 17:30	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS) - RE

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	69		42 - 120	10/21/16 09:29	10/24/16 17:39	1
2-Fluorophenol (Surr)	28		10 - 120	10/21/16 09:29	10/24/16 17:39	1
2,4,6-Tribromophenol (Surr)	67		35 - 125	10/21/16 09:29	10/24/16 17:39	1
Nitrobenzene-d5 (Surr)	70		36 - 120	10/21/16 09:29	10/24/16 17:39	1
Phenol-d5 (Surr)	16		10 - 120	10/21/16 09:29	10/24/16 17:39	1
Terphenyl-d14 (Surr)	70		17 - 120	10/21/16 09:29	10/24/16 17:39	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	0.092	J	0.50	0.080	ug/L			10/25/16 16:38	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	79		76 - 121		10/25/16 16:38	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	14		12	1.9	ug/L		10/15/16 10:30	10/24/16 13:14	500

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	0	X D	18 - 125	10/15/16 10:30	10/24/16 13:14	500

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.50	J	5.0	0.35	ug/L		10/14/16 14:00	10/21/16 03:38	1
Copper	1.6	J B	2.0	0.36	ug/L		10/14/16 14:00	10/21/16 03:38	1
Iron	10	J B	100	5.3	ug/L		10/14/16 14:00	10/21/16 03:38	1

TestAmerica Canton

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Client Sample ID: W-161012-PS-13

Lab Sample ID: 240-70803-3

Date Collected: 10/12/16 11:40

Matrix: Water

Date Received: 10/13/16 09:30

Method: 6020 - Metals (ICP/MS) - Dissolved (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	439	B	5.0	0.25	ug/L		10/14/16 14:00	10/21/16 03:38	1
Zinc	<6.2		20.0	6.2	ug/L		10/14/16 14:00	10/21/16 03:38	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	239		5.0	1.9	mg/L			10/14/16 18:25	1
Hardness as calcium carbonate	340		5.0	3.1	mg/L			10/27/16 09:28	1
Chloride	10.8		1.0	0.41	mg/L			10/17/16 07:33	1
Sulfate	124		1.0	0.13	mg/L			10/17/16 07:33	1
Total Organic Carbon	0.71	J	1.0	0.080	mg/L			10/17/16 12:44	1

General Chemistry - RA

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	1.2	H	0.10	0.035	mg/L			10/17/16 07:33	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Client Sample ID: W-161012-PS-14

Lab Sample ID: 240-70803-4

Date Collected: 10/12/16 11:40

Matrix: Water

Date Received: 10/13/16 09:30

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/20/16 02:24	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/20/16 02:24	1
Toluene	<0.23		1.0	0.23	ug/L			10/20/16 02:24	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/20/16 02:24	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	101		63 - 132		10/20/16 02:24	1
4-Bromofluorobenzene (Surr)	84		73 - 120		10/20/16 02:24	1
Toluene-d8 (Surr)	91		73 - 124		10/20/16 02:24	1
Dibromofluoromethane (Surr)	84		80 - 120		10/20/16 02:24	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.061		0.19	0.061	ug/L		10/19/16 06:19	10/20/16 16:19	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	73		42 - 120	10/19/16 06:19	10/20/16 16:19	1
2-Fluorophenol (Surr)	32		10 - 120	10/19/16 06:19	10/20/16 16:19	1
2,4,6-Tribromophenol (Surr)	70		35 - 125	10/19/16 06:19	10/20/16 16:19	1
Nitrobenzene-d5 (Surr)	70		36 - 120	10/19/16 06:19	10/20/16 16:19	1
Phenol-d5 (Surr)	19		10 - 120	10/19/16 06:19	10/20/16 16:19	1
Terphenyl-d14 (Surr)	59		17 - 120	10/19/16 06:19	10/20/16 16:19	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS) - RE

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	80		42 - 120	10/21/16 09:29	10/24/16 12:13	1
2-Fluorophenol (Surr)	34		10 - 120	10/21/16 09:29	10/24/16 12:13	1
2,4,6-Tribromophenol (Surr)	72		35 - 125	10/21/16 09:29	10/24/16 12:13	1
Nitrobenzene-d5 (Surr)	80		36 - 120	10/21/16 09:29	10/24/16 12:13	1
Phenol-d5 (Surr)	19		10 - 120	10/21/16 09:29	10/24/16 12:13	1
Terphenyl-d14 (Surr)	60		17 - 120	10/21/16 09:29	10/24/16 12:13	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.080		0.50	0.080	ug/L			10/25/16 16:55	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	80		76 - 121		10/25/16 16:55	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	0.18		0.095	0.015	ug/L		10/15/16 10:30	10/24/16 14:01	4

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	78		18 - 125	10/15/16 10:30	10/24/16 14:01	4

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.40	J	5.0	0.35	ug/L		10/14/16 14:00	10/21/16 03:43	1
Copper	1.7	J B	2.0	0.36	ug/L		10/14/16 14:00	10/21/16 03:43	1
Iron	61.7	J B	100	5.3	ug/L		10/14/16 14:00	10/21/16 03:43	1

TestAmerica Canton

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Client Sample ID: W-161012-PS-14

Lab Sample ID: 240-70803-4

Date Collected: 10/12/16 11:40

Matrix: Water

Date Received: 10/13/16 09:30

Method: 6020 - Metals (ICP/MS) - Dissolved (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	5.3	B	5.0	0.25	ug/L		10/14/16 14:00	10/21/16 03:43	1
Zinc	<6.2		20.0	6.2	ug/L		10/14/16 14:00	10/21/16 03:43	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	33.1		5.0	1.9	mg/L			10/14/16 18:33	1
Hardness as calcium carbonate	24.0		5.0	3.1	mg/L			10/27/16 09:36	1
Chloride	2.4		1.0	0.41	mg/L			10/17/16 08:33	1
Sulfate	2.2		1.0	0.13	mg/L			10/17/16 08:33	1
Total Organic Carbon	0.58	J	1.0	0.080	mg/L			10/17/16 13:39	1

General Chemistry - RA

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.30	H	0.10	0.035	mg/L			10/17/16 08:33	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Client Sample ID: W-161012-PS-15

Lab Sample ID: 240-70803-5

Date Collected: 10/12/16 12:45

Matrix: Water

Date Received: 10/13/16 09:30

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/20/16 02:46	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/20/16 02:46	1
Toluene	<0.23		1.0	0.23	ug/L			10/20/16 02:46	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/20/16 02:46	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	99		63 - 132		10/20/16 02:46	1
4-Bromofluorobenzene (Surr)	84		73 - 120		10/20/16 02:46	1
Toluene-d8 (Surr)	90		73 - 124		10/20/16 02:46	1
Dibromofluoromethane (Surr)	84		80 - 120		10/20/16 02:46	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.062		0.20	0.062	ug/L		10/19/16 06:19	10/20/16 16:43	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	77		42 - 120	10/19/16 06:19	10/20/16 16:43	1
2-Fluorophenol (Surr)	35		10 - 120	10/19/16 06:19	10/20/16 16:43	1
2,4,6-Tribromophenol (Surr)	70		35 - 125	10/19/16 06:19	10/20/16 16:43	1
Nitrobenzene-d5 (Surr)	80		36 - 120	10/19/16 06:19	10/20/16 16:43	1
Phenol-d5 (Surr)	18		10 - 120	10/19/16 06:19	10/20/16 16:43	1
Terphenyl-d14 (Surr)	77		17 - 120	10/19/16 06:19	10/20/16 16:43	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS) - RE

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	72		42 - 120	10/21/16 09:29	10/24/16 12:36	1
2-Fluorophenol (Surr)	32		10 - 120	10/21/16 09:29	10/24/16 12:36	1
2,4,6-Tribromophenol (Surr)	68		35 - 125	10/21/16 09:29	10/24/16 12:36	1
Nitrobenzene-d5 (Surr)	82		36 - 120	10/21/16 09:29	10/24/16 12:36	1
Phenol-d5 (Surr)	20		10 - 120	10/21/16 09:29	10/24/16 12:36	1
Terphenyl-d14 (Surr)	76		17 - 120	10/21/16 09:29	10/24/16 12:36	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	0.084	J	0.50	0.080	ug/L			10/25/16 17:12	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	79		76 - 121		10/25/16 17:12	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	3.8		0.095	0.015	ug/L		10/15/16 10:30	10/21/16 20:03	4

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	7	p X	18 - 125	10/15/16 10:30	10/21/16 20:03	4

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.35		5.0	0.35	ug/L		10/14/16 14:00	10/21/16 03:47	1
Copper	1.1	J B	2.0	0.36	ug/L		10/14/16 14:00	10/21/16 03:47	1
Iron	13.8	J B	100	5.3	ug/L		10/14/16 14:00	10/21/16 03:47	1

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Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Client Sample ID: W-161012-PS-15

Lab Sample ID: 240-70803-5

Date Collected: 10/12/16 12:45

Matrix: Water

Date Received: 10/13/16 09:30

Method: 6020 - Metals (ICP/MS) - Dissolved (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	67.3	B	5.0	0.25	ug/L		10/14/16 14:00	10/21/16 03:47	1
Zinc	<6.2		20.0	6.2	ug/L		10/14/16 14:00	10/21/16 03:47	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	52.2		5.0	1.9	mg/L			10/14/16 18:41	1
Hardness as calcium carbonate	86.0		5.0	3.1	mg/L			10/27/16 09:44	1
Chloride	3.8		1.0	0.41	mg/L			10/17/16 08:53	1
Sulfate	30.5		1.0	0.13	mg/L			10/17/16 08:53	1

General Chemistry - RA

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	1.6	H	0.10	0.035	mg/L			10/17/16 08:53	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Client Sample ID: TRIP BLANK 002

Lab Sample ID: 240-70803-6

Date Collected: 10/12/16 14:00

Matrix: Water

Date Received: 10/13/16 09:30

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/20/16 03:09	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/20/16 03:09	1
Toluene	<0.23		1.0	0.23	ug/L			10/20/16 03:09	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/20/16 03:09	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	101		63 - 132		10/20/16 03:09	1
4-Bromofluorobenzene (Surr)	82		73 - 120		10/20/16 03:09	1
Toluene-d8 (Surr)	89		73 - 124		10/20/16 03:09	1
Dibromofluoromethane (Surr)	86		80 - 120		10/20/16 03:09	1

Surrogate Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		12DCE (63-132)	BFB (73-120)	TOL (73-124)	DBFM (80-120)
240-70803-1	W-161012-PS-11	100	85	90	86
240-70803-2	W-161012-PS-12	100	84	89	86
240-70803-3	W-161012-PS-13	99	82	89	85
240-70803-4	W-161012-PS-14	101	84	91	84
240-70803-5	W-161012-PS-15	99	84	90	84
240-70803-6	TRIP BLANK 002	101	82	89	86
LCS 240-252194/4	Lab Control Sample	96	90	92	88
MB 240-252194/6	Method Blank	100	82	89	85

Surrogate Legend

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

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)					
		FBP (42-120)	2FP (10-120)	TBP (35-125)	NBZ (36-120)	PHL (10-120)	TPH (17-120)
240-70803-1	W-161012-PS-11	64	27	61	62	16	61
240-70803-1 - RE	W-161012-PS-11	69	28	68	72	17	73
240-70803-2	W-161012-PS-12	60	25	64	61	16	59
240-70803-2 - RE	W-161012-PS-12	66	27	71	64	17	66
240-70803-3	W-161012-PS-13	67	30	64	71	17	69
240-70803-3 - RE	W-161012-PS-13	69	28	67	70	16	70
240-70803-4	W-161012-PS-14	73	32	70	70	19	59
240-70803-4 - RE	W-161012-PS-14	80	34	72	80	19	60
240-70803-5	W-161012-PS-15	77	35	70	80	18	77
240-70803-5 - RE	W-161012-PS-15	72	32	68	82	20	76
LCS 240-252054/20-A	Lab Control Sample	79	59	80	81	39	93
LCS 240-252470/20-A	Lab Control Sample	86	82	86	89	73	98
MB 240-252054/19-A	Method Blank	17 X	12	14 X	18 X	7 X	21
MB 240-252470/19-A	Method Blank	86	80	81	88	67	98

Surrogate Legend

FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14 (Surr)

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Surrogate Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Method: RSK-175 - Dissolved Gases (GC)

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	Trifluoroet (76-121)
240-70803-1	W-161012-PS-11	81
240-70803-2	W-161012-PS-12	81
240-70803-3	W-161012-PS-13	79
240-70803-4	W-161012-PS-14	80
240-70803-5	W-161012-PS-15	79
LCS 240-252854/5	Lab Control Sample	89
MB 240-252854/4	Method Blank	90

Surrogate Legend

1,1,1-Trifluoroethane = 1,1,1-Trifluoroethane

Method: 8151A - Herbicides (GC)

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	DCPA1 (18-125)	DCPA2 (18-125)
240-70803-1	W-161012-PS-11	45	50
240-70803-2	W-161012-PS-12	50	58
240-70803-3	W-161012-PS-13	0 X D	0 X D
240-70803-4	W-161012-PS-14	63	78
240-70803-5	W-161012-PS-15	41	7 p X
LCS 180-191291/2-A	Lab Control Sample	51	53
MB 180-191291/1-A	Method Blank	83	95

Surrogate Legend

DCPA = 2,4-Dichlorophenylacetic acid

QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-252194/6
Matrix: Water
Analysis Batch: 252194

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/20/16 00:54	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/20/16 00:54	1
Toluene	<0.23		1.0	0.23	ug/L			10/20/16 00:54	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/20/16 00:54	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	100		63 - 132		10/20/16 00:54	1
4-Bromofluorobenzene (Surr)	82		73 - 120		10/20/16 00:54	1
Toluene-d8 (Surr)	89		73 - 124		10/20/16 00:54	1
Dibromofluoromethane (Surr)	85		80 - 120		10/20/16 00:54	1

Lab Sample ID: LCS 240-252194/4
Matrix: Water
Analysis Batch: 252194

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	10.0	9.58		ug/L		96	80 - 120
Ethylbenzene	10.0	9.15		ug/L		91	80 - 120
Toluene	10.0	9.91		ug/L		99	80 - 121
Xylenes, Total	20.0	18.2		ug/L		91	80 - 120
m-Xylene & p-Xylene	10.0	9.26		ug/L		93	80 - 120
o-Xylene	10.0	8.94		ug/L		89	80 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	96		63 - 132
4-Bromofluorobenzene (Surr)	90		73 - 120
Toluene-d8 (Surr)	92		73 - 124
Dibromofluoromethane (Surr)	88		80 - 120

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-252054/19-A
Matrix: Water
Analysis Batch: 252265

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 252054

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.063		0.20	0.063	ug/L		10/19/16 06:19	10/20/16 09:19	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	17	X	42 - 120	10/19/16 06:19	10/20/16 09:19	1
2-Fluorophenol (Surr)	12		10 - 120	10/19/16 06:19	10/20/16 09:19	1
2,4,6-Tribromophenol (Surr)	14	X	35 - 125	10/19/16 06:19	10/20/16 09:19	1
Nitrobenzene-d5 (Surr)	18	X	36 - 120	10/19/16 06:19	10/20/16 09:19	1
Phenol-d5 (Surr)	7	X	10 - 120	10/19/16 06:19	10/20/16 09:19	1
Terphenyl-d14 (Surr)	21		17 - 120	10/19/16 06:19	10/20/16 09:19	1

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QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-252054/20-A

Matrix: Water

Analysis Batch: 252265

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 252054

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Naphthalene	20.0	15.3		ug/L		76	54 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2-Fluorobiphenyl (Surr)	79		42 - 120
2-Fluorophenol (Surr)	59		10 - 120
2,4,6-Tribromophenol (Surr)	80		35 - 125
Nitrobenzene-d5 (Surr)	81		36 - 120
Phenol-d5 (Surr)	39		10 - 120
Terphenyl-d14 (Surr)	93		17 - 120

Lab Sample ID: MB 240-252470/19-A

Matrix: Water

Analysis Batch: 252706

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 252470

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.063		0.20	0.063	ug/L		10/21/16 09:29	10/24/16 09:30	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	86		42 - 120	10/21/16 09:29	10/24/16 09:30	1
2-Fluorophenol (Surr)	80		10 - 120	10/21/16 09:29	10/24/16 09:30	1
2,4,6-Tribromophenol (Surr)	81		35 - 125	10/21/16 09:29	10/24/16 09:30	1
Nitrobenzene-d5 (Surr)	88		36 - 120	10/21/16 09:29	10/24/16 09:30	1
Phenol-d5 (Surr)	67		10 - 120	10/21/16 09:29	10/24/16 09:30	1
Terphenyl-d14 (Surr)	98		17 - 120	10/21/16 09:29	10/24/16 09:30	1

Lab Sample ID: LCS 240-252470/20-A

Matrix: Water

Analysis Batch: 252706

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 252470

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Naphthalene	20.0	16.1		ug/L		80	54 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2-Fluorobiphenyl (Surr)	86		42 - 120
2-Fluorophenol (Surr)	82		10 - 120
2,4,6-Tribromophenol (Surr)	86		35 - 125
Nitrobenzene-d5 (Surr)	89		36 - 120
Phenol-d5 (Surr)	73		10 - 120
Terphenyl-d14 (Surr)	98		17 - 120

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QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 240-252854/4
Matrix: Water
Analysis Batch: 252854

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.080		0.50	0.080	ug/L			10/25/16 12:40	1
Surrogate	%Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	90		76 - 121					10/25/16 12:40	1

Lab Sample ID: LCS 240-252854/5
Matrix: Water
Analysis Batch: 252854

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Methane	199	201		ug/L		101	80 - 130
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
1,1,1-Trifluoroethane	89		76 - 121				

Method: 8151A - Herbicides (GC)

Lab Sample ID: MB 180-191291/1-A
Matrix: Water
Analysis Batch: 191929

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 191291

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.016		0.10	0.016	ug/L		10/15/16 10:30	10/21/16 12:29	4
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	95		18 - 125				10/15/16 10:30	10/21/16 12:29	4

Lab Sample ID: LCS 180-191291/2-A
Matrix: Water
Analysis Batch: 191929

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 191291

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Pentachlorophenol	1.00	1.03		ug/L		103	30 - 150
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
2,4-Dichlorophenylacetic acid	53		18 - 125				

Method: 6020 - Metals (ICP/MS)

Lab Sample ID: MB 240-251427/1-A
Matrix: Water
Analysis Batch: 252428

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 251427

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.35		5.0	0.35	ug/L		10/14/16 14:00	10/21/16 01:57	1
Copper	0.706	J	2.0	0.36	ug/L		10/14/16 14:00	10/21/16 01:57	1

TestAmerica Canton

QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Method: 6020 - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 240-251427/1-A
Matrix: Water
Analysis Batch: 252428

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 251427

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Iron	13.78	J	100	5.3	ug/L		10/14/16 14:00	10/21/16 01:57	1
Manganese	2.02	J	5.0	0.25	ug/L		10/14/16 14:00	10/21/16 01:57	1
Zinc	9.04	J	20.0	6.2	ug/L		10/14/16 14:00	10/21/16 01:57	1

Lab Sample ID: LCS 240-251427/2-A
Matrix: Water
Analysis Batch: 252428

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 251427

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	1000	910.2		ug/L		91	80 - 120
Copper	1000	1084		ug/L		108	80 - 120
Iron	10000	10410		ug/L		104	80 - 120
Manganese	1000	1022		ug/L		102	80 - 120
Zinc	1000	1053		ug/L		105	80 - 120

Method: 2320B-1997 - Alkalinity, Total

Lab Sample ID: MB 240-251647/5
Matrix: Water
Analysis Batch: 251647

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	<1.9		5.0	1.9	mg/L			10/14/16 17:10	1

Lab Sample ID: LCS 240-251647/4
Matrix: Water
Analysis Batch: 251647

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	368	375.6		mg/L		102	86 - 123

Method: 2340C-1997 - Hardness, Total

Lab Sample ID: MB 240-253223/1
Matrix: Water
Analysis Batch: 253223

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	<3.1		5.0	3.1	mg/L			10/27/16 08:32	1

Lab Sample ID: LCS 240-253223/2
Matrix: Water
Analysis Batch: 253223

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Hardness as calcium carbonate	170	166.0		mg/L		98	80 - 120

TestAmerica Canton

QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Method: 2340C-1997 - Hardness, Total (Continued)

Lab Sample ID: 240-70803-1 MS
Matrix: Water
Analysis Batch: 253223

Client Sample ID: W-161012-PS-11
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Hardness as calcium carbonate	92.0		200	296.0		mg/L		102	80 - 120

Lab Sample ID: 240-70803-1 MSD
Matrix: Water
Analysis Batch: 253223

Client Sample ID: W-161012-PS-11
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Hardness as calcium carbonate	92.0		200	294.0		mg/L		101	80 - 120	1	10

Lab Sample ID: 240-70803-1 DU
Matrix: Water
Analysis Batch: 253223

Client Sample ID: W-161012-PS-11
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Hardness as calcium carbonate	92.0		94.00		mg/L		2	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 240-251322/3
Matrix: Water
Analysis Batch: 251322

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	<0.035		0.10	0.035	mg/L			10/13/16 21:27	1

Lab Sample ID: LCS 240-251322/4
Matrix: Water
Analysis Batch: 251322

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	2.50	2.61		mg/L		104	90 - 110

Lab Sample ID: MB 240-251533/27
Matrix: Water
Analysis Batch: 251533

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.41		1.0	0.41	mg/L			10/16/16 22:09	1
Sulfate	<0.13		1.0	0.13	mg/L			10/16/16 22:09	1

Lab Sample ID: LCS 240-251533/28
Matrix: Water
Analysis Batch: 251533

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	51.18		mg/L		102	90 - 110
Sulfate	50.0	52.13		mg/L		104	90 - 110

TestAmerica Canton

QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: MB 240-251534/27
Matrix: Water
Analysis Batch: 251534

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	<0.035		0.10	0.035	mg/L			10/16/16 22:09	1

Lab Sample ID: LCS 240-251534/28
Matrix: Water
Analysis Batch: 251534

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	2.50	2.58		mg/L		103	90 - 110

Lab Sample ID: MB 240-251537/3
Matrix: Water
Analysis Batch: 251537

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.41		1.0	0.41	mg/L			10/17/16 06:52	1
Sulfate	<0.13		1.0	0.13	mg/L			10/17/16 06:52	1

Lab Sample ID: LCS 240-251537/4
Matrix: Water
Analysis Batch: 251537

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.95		mg/L		102	90 - 110
Sulfate	50.0	51.98		mg/L		104	90 - 110

Lab Sample ID: 240-70803-3 MS
Matrix: Water
Analysis Batch: 251537

Client Sample ID: W-161012-PS-13
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.8		50.0	64.31		mg/L		107	80 - 120
Sulfate	124		50.0	177.0		mg/L		105	80 - 120

Lab Sample ID: 240-70803-3 MSD
Matrix: Water
Analysis Batch: 251537

Client Sample ID: W-161012-PS-13
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.8		50.0	62.67		mg/L		104	80 - 120	3	15
Sulfate	124		50.0	174.9		mg/L		101	80 - 120	1	15

Lab Sample ID: MB 240-251538/3
Matrix: Water
Analysis Batch: 251538

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	<0.035		0.10	0.035	mg/L			10/17/16 06:52	1

TestAmerica Canton

QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 240-251538/4
Matrix: Water
Analysis Batch: 251538

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	2.50	2.57		mg/L		103	90 - 110

Lab Sample ID: 240-70803-3 MS
Matrix: Water
Analysis Batch: 251538

Client Sample ID: W-161012-PS-13
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	1.2	H	2.50	4.21		mg/L		120	80 - 120

Lab Sample ID: 240-70803-3 MSD
Matrix: Water
Analysis Batch: 251538

Client Sample ID: W-161012-PS-13
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate as N	1.2	H	2.50	4.10		mg/L		116	80 - 120	3	15

Method: 9060 - Organic Carbon, Total (TOC)

Lab Sample ID: MB 240-251836/4
Matrix: Water
Analysis Batch: 251836

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	<0.080		1.0	0.080	mg/L			10/17/16 11:07	1

Lab Sample ID: LCS 240-251836/6
Matrix: Water
Analysis Batch: 251836

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	46.3	46.28		mg/L		100	80 - 120

Lab Sample ID: LLCS 240-251836/5
Matrix: Water
Analysis Batch: 251836

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

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	4.63	4.38		mg/L		95	88 - 115

Lab Sample ID: 240-70803-1 MS
Matrix: Water
Analysis Batch: 251836

Client Sample ID: W-161012-PS-11
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	0.59	J	25.0	22.02		mg/L		86	65 - 134

TestAmerica Canton

QC Sample Results

Client: GHD Services Inc.
 Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

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

Lab Sample ID: 240-70803-1 MSD
 Matrix: Water
 Analysis Batch: 251836

Client Sample ID: W-161012-PS-11
 Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon	0.59	J	25.0	22.25		mg/L		87	65 - 134	1	10

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

QC Association Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

GC/MS VOA

Analysis Batch: 252194

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70803-1	W-161012-PS-11	Total/NA	Water	8260B	
240-70803-2	W-161012-PS-12	Total/NA	Water	8260B	
240-70803-3	W-161012-PS-13	Total/NA	Water	8260B	
240-70803-4	W-161012-PS-14	Total/NA	Water	8260B	
240-70803-5	W-161012-PS-15	Total/NA	Water	8260B	
240-70803-6	TRIP BLANK 002	Total/NA	Water	8260B	
MB 240-252194/6	Method Blank	Total/NA	Water	8260B	
LCS 240-252194/4	Lab Control Sample	Total/NA	Water	8260B	

GC/MS Semi VOA

Prep Batch: 252054

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70803-1	W-161012-PS-11	Total/NA	Water	3510C	
240-70803-2	W-161012-PS-12	Total/NA	Water	3510C	
240-70803-3	W-161012-PS-13	Total/NA	Water	3510C	
240-70803-4	W-161012-PS-14	Total/NA	Water	3510C	
240-70803-5	W-161012-PS-15	Total/NA	Water	3510C	
MB 240-252054/19-A	Method Blank	Total/NA	Water	3510C	
LCS 240-252054/20-A	Lab Control Sample	Total/NA	Water	3510C	

Analysis Batch: 252265

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70803-1	W-161012-PS-11	Total/NA	Water	8270C	252054
240-70803-2	W-161012-PS-12	Total/NA	Water	8270C	252054
240-70803-3	W-161012-PS-13	Total/NA	Water	8270C	252054
240-70803-4	W-161012-PS-14	Total/NA	Water	8270C	252054
240-70803-5	W-161012-PS-15	Total/NA	Water	8270C	252054
MB 240-252054/19-A	Method Blank	Total/NA	Water	8270C	252054
LCS 240-252054/20-A	Lab Control Sample	Total/NA	Water	8270C	252054

Prep Batch: 252470

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70803-1 - RE	W-161012-PS-11	Total/NA	Water	3510C	
240-70803-2 - RE	W-161012-PS-12	Total/NA	Water	3510C	
240-70803-3 - RE	W-161012-PS-13	Total/NA	Water	3510C	
240-70803-4 - RE	W-161012-PS-14	Total/NA	Water	3510C	
240-70803-5 - RE	W-161012-PS-15	Total/NA	Water	3510C	
MB 240-252470/19-A	Method Blank	Total/NA	Water	3510C	
LCS 240-252470/20-A	Lab Control Sample	Total/NA	Water	3510C	

Analysis Batch: 252706

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70803-1 - RE	W-161012-PS-11	Total/NA	Water	8270C	252470
240-70803-2 - RE	W-161012-PS-12	Total/NA	Water	8270C	252470
240-70803-3 - RE	W-161012-PS-13	Total/NA	Water	8270C	252470
240-70803-4 - RE	W-161012-PS-14	Total/NA	Water	8270C	252470
240-70803-5 - RE	W-161012-PS-15	Total/NA	Water	8270C	252470
MB 240-252470/19-A	Method Blank	Total/NA	Water	8270C	252470
LCS 240-252470/20-A	Lab Control Sample	Total/NA	Water	8270C	252470

TestAmerica Canton

QC Association Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

GC VOA

Analysis Batch: 252854

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70803-1	W-161012-PS-11	Total/NA	Water	RSK-175	
240-70803-2	W-161012-PS-12	Total/NA	Water	RSK-175	
240-70803-3	W-161012-PS-13	Total/NA	Water	RSK-175	
240-70803-4	W-161012-PS-14	Total/NA	Water	RSK-175	
240-70803-5	W-161012-PS-15	Total/NA	Water	RSK-175	
MB 240-252854/4	Method Blank	Total/NA	Water	RSK-175	
LCS 240-252854/5	Lab Control Sample	Total/NA	Water	RSK-175	

GC Semi VOA

Prep Batch: 191291

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70803-1	W-161012-PS-11	Total/NA	Water	8151A	
240-70803-2	W-161012-PS-12	Total/NA	Water	8151A	
240-70803-3	W-161012-PS-13	Total/NA	Water	8151A	
240-70803-4	W-161012-PS-14	Total/NA	Water	8151A	
240-70803-5	W-161012-PS-15	Total/NA	Water	8151A	
MB 180-191291/1-A	Method Blank	Total/NA	Water	8151A	
LCS 180-191291/2-A	Lab Control Sample	Total/NA	Water	8151A	

Analysis Batch: 191929

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70803-1	W-161012-PS-11	Total/NA	Water	8151A	191291
240-70803-2	W-161012-PS-12	Total/NA	Water	8151A	191291
240-70803-5	W-161012-PS-15	Total/NA	Water	8151A	191291
MB 180-191291/1-A	Method Blank	Total/NA	Water	8151A	191291
LCS 180-191291/2-A	Lab Control Sample	Total/NA	Water	8151A	191291

Analysis Batch: 192136

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70803-3	W-161012-PS-13	Total/NA	Water	8151A	191291
240-70803-4	W-161012-PS-14	Total/NA	Water	8151A	191291

Metals

Prep Batch: 251427

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70803-1	W-161012-PS-11	Dissolved	Water	3005A	
240-70803-2	W-161012-PS-12	Dissolved	Water	3005A	
240-70803-3	W-161012-PS-13	Dissolved	Water	3005A	
240-70803-4	W-161012-PS-14	Dissolved	Water	3005A	
240-70803-5	W-161012-PS-15	Dissolved	Water	3005A	
MB 240-251427/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-251427/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 252428

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70803-1	W-161012-PS-11	Dissolved	Water	6020	251427
240-70803-2	W-161012-PS-12	Dissolved	Water	6020	251427
240-70803-3	W-161012-PS-13	Dissolved	Water	6020	251427

TestAmerica Canton

QC Association Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Metals (Continued)

Analysis Batch: 252428 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70803-4	W-161012-PS-14	Dissolved	Water	6020	251427
240-70803-5	W-161012-PS-15	Dissolved	Water	6020	251427
MB 240-251427/1-A	Method Blank	Total Recoverable	Water	6020	251427
LCS 240-251427/2-A	Lab Control Sample	Total Recoverable	Water	6020	251427

General Chemistry

Analysis Batch: 251322

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70803-1	W-161012-PS-11	Total/NA	Water	300.0	
240-70803-2	W-161012-PS-12	Total/NA	Water	300.0	
240-70803-3	W-161012-PS-13	Total/NA	Water	300.0	
240-70803-4	W-161012-PS-14	Total/NA	Water	300.0	
240-70803-5	W-161012-PS-15	Total/NA	Water	300.0	
MB 240-251322/3	Method Blank	Total/NA	Water	300.0	
LCS 240-251322/4	Lab Control Sample	Total/NA	Water	300.0	
240-70803-4 MS	W-161012-PS-14	Total/NA	Water	300.0	
240-70803-4 MSD	W-161012-PS-14	Total/NA	Water	300.0	

Analysis Batch: 251533

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70803-1	W-161012-PS-11	Total/NA	Water	300.0	
240-70803-2	W-161012-PS-12	Total/NA	Water	300.0	
MB 240-251533/27	Method Blank	Total/NA	Water	300.0	
LCS 240-251533/28	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 251534

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70803-1 - RA	W-161012-PS-11	Total/NA	Water	300.0	
240-70803-2 - RA	W-161012-PS-12	Total/NA	Water	300.0	
MB 240-251534/27	Method Blank	Total/NA	Water	300.0	
LCS 240-251534/28	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 251537

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70803-3	W-161012-PS-13	Total/NA	Water	300.0	
240-70803-4	W-161012-PS-14	Total/NA	Water	300.0	
240-70803-5	W-161012-PS-15	Total/NA	Water	300.0	
MB 240-251537/3	Method Blank	Total/NA	Water	300.0	
LCS 240-251537/4	Lab Control Sample	Total/NA	Water	300.0	
240-70803-3 MS	W-161012-PS-13	Total/NA	Water	300.0	
240-70803-3 MSD	W-161012-PS-13	Total/NA	Water	300.0	

Analysis Batch: 251538

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70803-3 - RA	W-161012-PS-13	Total/NA	Water	300.0	
240-70803-4 - RA	W-161012-PS-14	Total/NA	Water	300.0	
240-70803-5 - RA	W-161012-PS-15	Total/NA	Water	300.0	
MB 240-251538/3	Method Blank	Total/NA	Water	300.0	
LCS 240-251538/4	Lab Control Sample	Total/NA	Water	300.0	

TestAmerica Canton

QC Association Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

General Chemistry (Continued)

Analysis Batch: 251538 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70803-3 MS	W-161012-PS-13	Total/NA	Water	300.0	
240-70803-3 MSD	W-161012-PS-13	Total/NA	Water	300.0	

Analysis Batch: 251647

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70803-1	W-161012-PS-11	Total/NA	Water	2320B-1997	
240-70803-2	W-161012-PS-12	Total/NA	Water	2320B-1997	
240-70803-3	W-161012-PS-13	Total/NA	Water	2320B-1997	
240-70803-4	W-161012-PS-14	Total/NA	Water	2320B-1997	
240-70803-5	W-161012-PS-15	Total/NA	Water	2320B-1997	
MB 240-251647/5	Method Blank	Total/NA	Water	2320B-1997	
LCS 240-251647/4	Lab Control Sample	Total/NA	Water	2320B-1997	

Analysis Batch: 251836

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70803-1	W-161012-PS-11	Total/NA	Water	9060	
240-70803-2	W-161012-PS-12	Total/NA	Water	9060	
240-70803-3	W-161012-PS-13	Total/NA	Water	9060	
240-70803-4	W-161012-PS-14	Total/NA	Water	9060	
MB 240-251836/4	Method Blank	Total/NA	Water	9060	
LCS 240-251836/6	Lab Control Sample	Total/NA	Water	9060	
LLCS 240-251836/5	Lab Control Sample	Total/NA	Water	9060	
240-70803-1 MS	W-161012-PS-11	Total/NA	Water	9060	
240-70803-1 MSD	W-161012-PS-11	Total/NA	Water	9060	

Analysis Batch: 253223

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70803-1	W-161012-PS-11	Total/NA	Water	2340C-1997	
240-70803-2	W-161012-PS-12	Total/NA	Water	2340C-1997	
240-70803-3	W-161012-PS-13	Total/NA	Water	2340C-1997	
240-70803-4	W-161012-PS-14	Total/NA	Water	2340C-1997	
240-70803-5	W-161012-PS-15	Total/NA	Water	2340C-1997	
MB 240-253223/1	Method Blank	Total/NA	Water	2340C-1997	
LCS 240-253223/2	Lab Control Sample	Total/NA	Water	2340C-1997	
240-70803-1 MS	W-161012-PS-11	Total/NA	Water	2340C-1997	
240-70803-1 MSD	W-161012-PS-11	Total/NA	Water	2340C-1997	
240-70803-1 DU	W-161012-PS-11	Total/NA	Water	2340C-1997	

Lab Chronicle

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Client Sample ID: W-161012-PS-11

Lab Sample ID: 240-70803-1

Date Collected: 10/12/16 10:00

Matrix: Water

Date Received: 10/13/16 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	252194	10/20/16 01:16	LRW	TAL CAN
Total/NA	Prep	3510C			252054	10/19/16 06:19	SDE	TAL CAN
Total/NA	Analysis	8270C		1	252265	10/20/16 20:13	JMG	TAL CAN
Total/NA	Prep	3510C	RE		252470	10/21/16 09:29	JDR	TAL CAN
Total/NA	Analysis	8270C	RE	1	252706	10/24/16 17:16	JMG	TAL CAN
Total/NA	Analysis	RSK-175		1	252854	10/25/16 16:04	BPM	TAL CAN
Total/NA	Prep	8151A			191291	10/15/16 10:30	CBY	TAL PIT
Total/NA	Analysis	8151A		4	191929	10/21/16 18:28	JMO	TAL PIT
Dissolved	Prep	3005A			251427	10/14/16 14:00	AJC	TAL CAN
Dissolved	Analysis	6020		1	252428	10/21/16 03:30	AS1	TAL CAN
Total/NA	Analysis	2320B-1997		1	251647	10/14/16 18:06	LKG	TAL CAN
Total/NA	Analysis	2340C-1997		1	253223	10/27/16 08:56	TPH	TAL CAN
Total/NA	Analysis	300.0		1	251322	10/14/16 08:12	LCN	TAL CAN
Total/NA	Analysis	300.0		1	251533	10/17/16 04:51	LKG	TAL CAN
Total/NA	Analysis	300.0	RA	1	251534	10/17/16 04:51	LKG	TAL CAN
Total/NA	Analysis	9060		1	251836	10/17/16 11:31	TPH	TAL CAN

Client Sample ID: W-161012-PS-12

Lab Sample ID: 240-70803-2

Date Collected: 10/12/16 11:05

Matrix: Water

Date Received: 10/13/16 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	252194	10/20/16 01:39	LRW	TAL CAN
Total/NA	Prep	3510C			252054	10/19/16 06:19	SDE	TAL CAN
Total/NA	Analysis	8270C		1	252265	10/20/16 17:06	JMG	TAL CAN
Total/NA	Prep	3510C	RE		252470	10/21/16 09:29	JDR	TAL CAN
Total/NA	Analysis	8270C	RE	1	252706	10/24/16 12:59	JMG	TAL CAN
Total/NA	Analysis	RSK-175		1	252854	10/25/16 16:21	BPM	TAL CAN
Total/NA	Prep	8151A			191291	10/15/16 10:30	CBY	TAL PIT
Total/NA	Analysis	8151A		4	191929	10/21/16 18:51	JMO	TAL PIT
Dissolved	Prep	3005A			251427	10/14/16 14:00	AJC	TAL CAN
Dissolved	Analysis	6020		1	252428	10/21/16 03:34	AS1	TAL CAN
Total/NA	Analysis	2320B-1997		1	251647	10/14/16 18:15	LKG	TAL CAN
Total/NA	Analysis	2340C-1997		1	253223	10/27/16 09:20	TPH	TAL CAN
Total/NA	Analysis	300.0		1	251322	10/14/16 08:32	LCN	TAL CAN
Total/NA	Analysis	300.0		1	251533	10/17/16 05:11	LKG	TAL CAN
Total/NA	Analysis	300.0	RA	1	251534	10/17/16 05:11	LKG	TAL CAN
Total/NA	Analysis	9060		1	251836	10/17/16 12:17	TPH	TAL CAN

TestAmerica Canton

Lab Chronicle

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Client Sample ID: W-161012-PS-13

Lab Sample ID: 240-70803-3

Date Collected: 10/12/16 11:40

Matrix: Water

Date Received: 10/13/16 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	252194	10/20/16 02:01	LRW	TAL CAN
Total/NA	Prep	3510C			252054	10/19/16 06:19	SDE	TAL CAN
Total/NA	Analysis	8270C		1	252265	10/20/16 17:30	JMG	TAL CAN
Total/NA	Prep	3510C	RE		252470	10/21/16 09:29	JDR	TAL CAN
Total/NA	Analysis	8270C	RE	1	252706	10/24/16 17:39	JMG	TAL CAN
Total/NA	Analysis	RSK-175		1	252854	10/25/16 16:38	BPM	TAL CAN
Total/NA	Prep	8151A			191291	10/15/16 10:30	CBY	TAL PIT
Total/NA	Analysis	8151A		500	192136	10/24/16 13:14	JMO	TAL PIT
Dissolved	Prep	3005A			251427	10/14/16 14:00	AJC	TAL CAN
Dissolved	Analysis	6020		1	252428	10/21/16 03:38	AS1	TAL CAN
Total/NA	Analysis	2320B-1997		1	251647	10/14/16 18:25	LKG	TAL CAN
Total/NA	Analysis	2340C-1997		1	253223	10/27/16 09:28	TPH	TAL CAN
Total/NA	Analysis	300.0		1	251322	10/14/16 09:33	LCN	TAL CAN
Total/NA	Analysis	300.0		1	251537	10/17/16 07:33	LKG	TAL CAN
Total/NA	Analysis	300.0	RA	1	251538	10/17/16 07:33	LKG	TAL CAN
Total/NA	Analysis	9060		1	251836	10/17/16 12:44	TPH	TAL CAN

Client Sample ID: W-161012-PS-14

Lab Sample ID: 240-70803-4

Date Collected: 10/12/16 11:40

Matrix: Water

Date Received: 10/13/16 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	252194	10/20/16 02:24	LRW	TAL CAN
Total/NA	Prep	3510C			252054	10/19/16 06:19	SDE	TAL CAN
Total/NA	Analysis	8270C		1	252265	10/20/16 16:19	JMG	TAL CAN
Total/NA	Prep	3510C	RE		252470	10/21/16 09:29	JDR	TAL CAN
Total/NA	Analysis	8270C	RE	1	252706	10/24/16 12:13	JMG	TAL CAN
Total/NA	Analysis	RSK-175		1	252854	10/25/16 16:55	BPM	TAL CAN
Total/NA	Prep	8151A			191291	10/15/16 10:30	CBY	TAL PIT
Total/NA	Analysis	8151A		4	192136	10/24/16 14:01	JMO	TAL PIT
Dissolved	Prep	3005A			251427	10/14/16 14:00	AJC	TAL CAN
Dissolved	Analysis	6020		1	252428	10/21/16 03:43	AS1	TAL CAN
Total/NA	Analysis	2320B-1997		1	251647	10/14/16 18:33	LKG	TAL CAN
Total/NA	Analysis	2340C-1997		1	253223	10/27/16 09:36	TPH	TAL CAN
Total/NA	Analysis	300.0		1	251322	10/14/16 09:53	LCN	TAL CAN
Total/NA	Analysis	300.0		1	251537	10/17/16 08:33	LKG	TAL CAN
Total/NA	Analysis	300.0	RA	1	251538	10/17/16 08:33	LKG	TAL CAN
Total/NA	Analysis	9060		1	251836	10/17/16 13:39	TPH	TAL CAN

TestAmerica Canton

Lab Chronicle

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Client Sample ID: W-161012-PS-15

Lab Sample ID: 240-70803-5

Date Collected: 10/12/16 12:45

Matrix: Water

Date Received: 10/13/16 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	252194	10/20/16 02:46	LRW	TAL CAN
Total/NA	Prep	3510C			252054	10/19/16 06:19	SDE	TAL CAN
Total/NA	Analysis	8270C		1	252265	10/20/16 16:43	JMG	TAL CAN
Total/NA	Prep	3510C	RE		252470	10/21/16 09:29	JDR	TAL CAN
Total/NA	Analysis	8270C	RE	1	252706	10/24/16 12:36	JMG	TAL CAN
Total/NA	Analysis	RSK-175		1	252854	10/25/16 17:12	BPM	TAL CAN
Total/NA	Prep	8151A			191291	10/15/16 10:30	CBY	TAL PIT
Total/NA	Analysis	8151A		4	191929	10/21/16 20:03	JMO	TAL PIT
Dissolved	Prep	3005A			251427	10/14/16 14:00	AJC	TAL CAN
Dissolved	Analysis	6020		1	252428	10/21/16 03:47	AS1	TAL CAN
Total/NA	Analysis	2320B-1997		1	251647	10/14/16 18:41	LKG	TAL CAN
Total/NA	Analysis	2340C-1997		1	253223	10/27/16 09:44	TPH	TAL CAN
Total/NA	Analysis	300.0		1	251322	10/14/16 11:49	LCN	TAL CAN
Total/NA	Analysis	300.0		1	251537	10/17/16 08:53	LKG	TAL CAN
Total/NA	Analysis	300.0	RA	1	251538	10/17/16 08:53	LKG	TAL CAN

Client Sample ID: TRIP BLANK 002

Lab Sample ID: 240-70803-6

Date Collected: 10/12/16 14:00

Matrix: Water

Date Received: 10/13/16 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	252194	10/20/16 03:09	LRW	TAL CAN

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Certification Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70803-1

Laboratory: TestAmerica Canton

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Wisconsin	State Program	5	999518190	08-31-17

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
RSK-175		Water	Methane

Laboratory: TestAmerica Pittsburgh

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Wisconsin	State Program	5	998027800	08-31-17



1.2/CA.6

0.2/CO.6

Chain of Custody Record

COLUMBUS

240507

Client Information	Sampler: Peter Starlitz	Lab PM: Heckler, Denise D	Carrier Tracking No(s):	COC No: 240-37523-16440.2
Client Contact: Mr. Grant Anderson	Phone: 651-247-4218	E-Mail: denise.heckler@testamericainc.com		Page: 2 of 3

Company: GHD Services Inc.	Analysis Requested			Job #:
Address: 1801 Old Highway 8 NW Suite 114	Due Date Requested:			Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Z - other (specify)
City: St. Paul	TAT Requested (days):	STANDARD		
State, Zip: MN, 55112	PO #: 34001059			
Phone: 651-639-0913(Tel) 651-639-0923(Fax)	WO #: 86165			
Email: grant.anderson@ghd.com	Project #: 24012755			Other:
Project Name: 86165-03-11, Penta Wood	SSOW#:			
Site:				

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Analysis Requested					Total Number of containers	Special Instructions/Note:
							2320B - Alkalinity	2340C - Hardness as calcium carbonate	RSK_176 - Methane	9060 - TOC	300 - Nitrate, Chloride, Sulfate		
							N	D	A	S	N		
W-161012-PS-11	10-12-16	1000		Water			X	X	X	X	X		
12		1105		Water			X	X	X	X	X		
13		1140		Water			X	X	X	X	X		
14		1140		Water			X	X	X	X	X		
15		1245		Water			X	X	X	Y	X		
TRIP BLANK 002				Water									
				Water									
				Water									
				Water									
				Water									
				Water									

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

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by: [Signature]	Date/Time: 10-12-16 / 1600	Company: GHD	Received by: [Signature] Date/Time: 10/13/16 930 Company: TAR
Relinquished by:	Date/Time:	Company:	Received by: Date/Time: Company:
Relinquished by:	Date/Time:	Company:	Received by: Date/Time: Company:
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:	

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10/27/2016



TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 2003

Client GTD SERVICES Site Name GTD Cooler unpacked by: [Signature]
 Cooler Received on 10-17-16 Opened on 10-13-16
 FedEx: 1st Grd Exp UPS FAS Stetson Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____
 Packing material used: Bubble Wrap Foam Plastic Bag None _____ Other _____
 COOLANT: Wet Ice Blue Ice _____ Dry Ice _____ Water _____ None _____

1. Cooler temperature upon receipt See Multiple Cooler Form
 IR GUN# IR-8 (CF +0.4 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
 IR GUN #36 (CF +1.3 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were custody seals on the outside of the cooler(s)? If Yes Quantity 4 Yes No
 -Were custody seals on the outside of the cooler(s) signed & dated? Yes No NA
 -Were custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No

3. Shippers' packing slip attached to the cooler(s)? Yes No
 4. Did custody papers accompany the sample(s)? Yes No
 5. Were the custody papers relinquished & signed in the appropriate place? Yes No
 6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
 7. Did all bottles arrive in good condition (Unbroken)? Yes No
 8. Could all bottle labels be reconciled with the COC? Yes No
 9. Were correct bottle(s) used for the test(s) indicated? Yes No
 10. Sufficient quantity received to perform indicated analyses? Yes No
 11. Are these work share samples? Yes No
 If yes, Questions 11-15 have been checked at the originating laboratory.

11. Were sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC574756
 12. Were VOAs on the COC? Yes No
 13. Were air bubbles >6 mm in any VOA vials? Yes No NA
 14. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # B61520V3 Yes No
 15. Was a LL Hg or Me Hg trip blank present? Yes No

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other _____
 Concerning _____

14. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by: _____

15. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
 Sample(s) _____ were received in a broken container.
 Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

16. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
 Time preserved: _____ Preservative(s) added/Lot number(s): _____

Temperature readings: _____

<u>Client Sample ID</u>	<u>Lab ID</u>	<u>Container Type</u>	<u>Container pH</u>	<u>Preservative Added (mls)</u>	<u>Lot #</u>
W-161012-PS-11	240-70803-J-1	Plastic 250ml - with Nitric Acid	<2	_____	_____
W-161012-PS-11	240-70803-K-1	Plastic 500ml - w/ Nitric - Dis.	<2	_____	_____
W-161012-PS-12	240-70803-J-2	Plastic 250ml - with Nitric Acid	<2	_____	_____
W-161012-PS-12	240-70803-K-2	Plastic 500ml - w/ Nitric - Dis.	<2	_____	_____
W-161012-PS-13	240-70803-J-3	Plastic 250ml - with Nitric Acid	<2	_____	_____
W-161012-PS-13	240-70803-K-3	Plastic 500ml - w/ Nitric - Dis.	<2	_____	_____
W-161012-PS-14	240-70803-J-4	Plastic 250ml - with Nitric Acid	<2	_____	_____
W-161012-PS-14	240-70803-K-4	Plastic 500ml - w/ Nitric - Dis.	<2	_____	_____
W-161012-PS-15	240-70803-J-5	Plastic 250ml - with Nitric Acid	<2	_____	_____
W-161012-PS-15	240-70803-K-5	Plastic 500ml - w/ Nitric - Dis.	<2	_____	_____



Login Sample Receipt Checklist

Client: GHD Services Inc.

Job Number: 240-70803-1

Login Number: 70803
List Number: 2
Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh
List Creation: 10/14/16 08:21 PM

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



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Canton

4101 Shuffel Street NW

North Canton, OH 44720

Tel: (330)497-9396

TestAmerica Job ID: 240-70898-1

Client Project/Site: 86165-03-11, Penta Wood

For:

GHD Services Inc.

1801 Old Highway 8 NW

Suite 114

St. Paul, Minnesota 55112

Attn: Mr. Grant Anderson



Authorized for release by:

10/27/2016 10:21:34 AM

Denise Heckler, Project Manager II

(330)966-9477

denise.heckler@testamericainc.com

LINKS

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results through

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www.testamericainc.com

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

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

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Definitions/Glossary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70898-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Reported value was between the limit of detection and the limit of quantitation.

GC/MS Semi VOA

Qualifier	Qualifier Description
X	Surrogate is outside control limits

GC VOA

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Reported value was between the limit of detection and the limit of quantitation.

GC Semi VOA

Qualifier	Qualifier Description
^c	CCV Recovery is outside acceptance limits.
D	Surrogate or matrix spike recoveries were not obtained because the extract was diluted for analysis; also compounds analyzed at a dilution may be flagged with a D.
X	Surrogate is outside control limits

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Reported value was between the limit of detection and the limit of quantitation.

General Chemistry

Qualifier	Qualifier Description
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.

Glossary

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

Case Narrative

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70898-1

Job ID: 240-70898-1

Laboratory: TestAmerica Canton

Narrative

Job Narrative 240-70898-1

Comments

No additional comments.

Receipt

The samples were received on 10/15/2016 9:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.2° C.

GC/MS VOA

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

GC/MS Semi VOA

Method(s) 8270C: The following sample was diluted due to the nature of the sample matrix: W-161014-PS-24 (240-70898-2). Elevated reporting limits (RLs) are provided.

Method(s) 8270C: Six surrogates are used for this analysis. The laboratory's SOP allows one acid and one base of these surrogates to be outside acceptance criteria without performing re-extraction/re-analysis. The following sample contained an allowable number of surrogate compounds outside limits: W-161014-PS-23 (240-70898-1). These results have been reported and qualified.

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

GC VOA

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

GC Semi VOA

Method(s) 8151A: The following samples was diluted due to the abundance of target analytes: W-161014-PS-23 (240-70898-1) and W-161014-PS-24 (240-70898-2).

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

Metals

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

General Chemistry

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

Organic Prep

Method(s) 8151A: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with preparation batch 180-191589.

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

VOA Prep

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

Method Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70898-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8270C	Semivolatile Organic Compounds (GC/MS)	SW846	TAL CAN
RSK-175	Dissolved Gases (GC)	RSK	TAL CAN
8151A	Herbicides (GC)	SW846	TAL PIT
6020	Metals (ICP/MS)	SW846	TAL CAN
2320B-1997	Alkalinity, Total	SM	TAL CAN
2340C-1997	Hardness, Total	SM	TAL CAN
300.0	Anions, Ion Chromatography	MCAWW	TAL CAN
9060	Organic Carbon, Total (TOC)	SW846	TAL CAN

Protocol References:

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

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

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

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

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70898-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-70898-1	W-161014-PS-23	Water	10/14/16 08:20	10/15/16 09:40
240-70898-2	W-161014-PS-24	Water	10/14/16 09:10	10/15/16 09:40
240-70898-3	TRIP BLANK 004	Water	10/14/16 10:00	10/15/16 09:40

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Detection Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70898-1

Client Sample ID: W-161014-PS-23

Lab Sample ID: 240-70898-1

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Ethylbenzene	0.53	J	1.0	0.26	ug/L	1		8260B	Total/NA
Toluene	0.54	J	1.0	0.23	ug/L	1		8260B	Total/NA
Xylenes, Total	7.1		2.0	0.24	ug/L	1		8260B	Total/NA
Naphthalene	6.8		0.19	0.060	ug/L	1		8270C	Total/NA
Methane	40	B	0.50	0.080	ug/L	1		RSK-175	Total/NA
Pentachlorophenol	4200		240	37	ug/L	10000		8151A	Total/NA
Arsenic	18.5		5.0	0.35	ug/L	1		6020	Dissolved
Copper	30.6	B	2.0	0.36	ug/L	1		6020	Dissolved
Iron	15600	B	100	5.3	ug/L	1		6020	Dissolved
Manganese	2360		5.0	0.25	ug/L	1		6020	Dissolved
Zinc	8.4	J	20.0	6.2	ug/L	1		6020	Dissolved
Alkalinity	296		5.0	1.9	mg/L	1		2320B-1997	Total/NA
Hardness as calcium carbonate	236		5.0	3.1	mg/L	1		2340C-1997	Total/NA
Chloride	25.1		1.0	0.41	mg/L	1		300.0	Total/NA
Sulfate	11.8		1.0	0.13	mg/L	1		300.0	Total/NA
Total Organic Carbon	34.7		1.0	0.080	mg/L	1		9060	Total/NA

Client Sample ID: W-161014-PS-24

Lab Sample ID: 240-70898-2

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Ethylbenzene	0.98	J	1.0	0.26	ug/L	1		8260B	Total/NA
Toluene	1.6		1.0	0.23	ug/L	1		8260B	Total/NA
Xylenes, Total	11		2.0	0.24	ug/L	1		8260B	Total/NA
Naphthalene	32		0.76	0.24	ug/L	4		8270C	Total/NA
Methane	0.32	J B	0.50	0.080	ug/L	1		RSK-175	Total/NA
Pentachlorophenol	20000		1200	190	ug/L	50000		8151A	Total/NA
Arsenic	0.35	J	5.0	0.35	ug/L	1		6020	Dissolved
Copper	2.6	B	2.0	0.36	ug/L	1		6020	Dissolved
Iron	1970	B	100	5.3	ug/L	1		6020	Dissolved
Manganese	3220		5.0	0.25	ug/L	1		6020	Dissolved
Alkalinity	83.0		5.0	1.9	mg/L	1		2320B-1997	Total/NA
Hardness as calcium carbonate	124		5.0	3.1	mg/L	1		2340C-1997	Total/NA
Chloride	15.9		1.0	0.41	mg/L	1		300.0	Total/NA
Sulfate	16.3		1.0	0.13	mg/L	1		300.0	Total/NA
Total Organic Carbon	56.9	^	1.0	0.080	mg/L	1		9060	Total/NA

Client Sample ID: TRIP BLANK 004

Lab Sample ID: 240-70898-3

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Canton

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70898-1

Client Sample ID: W-161014-PS-23

Lab Sample ID: 240-70898-1

Date Collected: 10/14/16 08:20

Matrix: Water

Date Received: 10/15/16 09:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/25/16 14:23	1
Ethylbenzene	0.53	J	1.0	0.26	ug/L			10/25/16 14:23	1
Toluene	0.54	J	1.0	0.23	ug/L			10/25/16 14:23	1
Xylenes, Total	7.1		2.0	0.24	ug/L			10/25/16 14:23	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	97		63 - 132		10/25/16 14:23	1
4-Bromofluorobenzene (Surr)	92		73 - 120		10/25/16 14:23	1
Toluene-d8 (Surr)	105		73 - 124		10/25/16 14:23	1
Dibromofluoromethane (Surr)	98		80 - 120		10/25/16 14:23	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	6.8		0.19	0.060	ug/L		10/20/16 14:26	10/22/16 19:52	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	38	X	42 - 120	10/20/16 14:26	10/22/16 19:52	1
2-Fluorophenol (Surr)	28		10 - 120	10/20/16 14:26	10/22/16 19:52	1
2,4,6-Tribromophenol (Surr)	49		35 - 125	10/20/16 14:26	10/22/16 19:52	1
Nitrobenzene-d5 (Surr)	61		36 - 120	10/20/16 14:26	10/22/16 19:52	1
Phenol-d5 (Surr)	18		10 - 120	10/20/16 14:26	10/22/16 19:52	1
Terphenyl-d14 (Surr)	47		17 - 120	10/20/16 14:26	10/22/16 19:52	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	40	B	0.50	0.080	ug/L			10/26/16 17:29	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	84		76 - 121		10/26/16 17:29	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	4200		240	37	ug/L		10/18/16 15:30	10/25/16 08:42	10000

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	0	X ^c D	18 - 125	10/18/16 15:30	10/25/16 08:42	10000

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	18.5		5.0	0.35	ug/L		10/17/16 14:00	10/19/16 00:18	1
Copper	30.6	B	2.0	0.36	ug/L		10/17/16 14:00	10/19/16 00:18	1
Iron	15600	B	100	5.3	ug/L		10/17/16 14:00	10/19/16 00:18	1
Manganese	2360		5.0	0.25	ug/L		10/17/16 14:00	10/19/16 00:18	1
Zinc	8.4	J	20.0	6.2	ug/L		10/17/16 14:00	10/19/16 00:18	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	296		5.0	1.9	mg/L			10/21/16 20:25	1
Hardness as calcium carbonate	236		5.0	3.1	mg/L			10/19/16 09:00	1
Chloride	25.1		1.0	0.41	mg/L			10/15/16 17:37	1
Nitrate as N	<0.035		0.10	0.035	mg/L			10/15/16 17:37	1

TestAmerica Canton

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70898-1

Client Sample ID: W-161014-PS-23

Lab Sample ID: 240-70898-1

Date Collected: 10/14/16 08:20

Matrix: Water

Date Received: 10/15/16 09:40

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	11.8		1.0	0.13	mg/L			10/15/16 17:37	1
Total Organic Carbon	34.7		1.0	0.080	mg/L			10/17/16 13:10	1

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Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70898-1

Client Sample ID: W-161014-PS-24

Lab Sample ID: 240-70898-2

Date Collected: 10/14/16 09:10

Matrix: Water

Date Received: 10/15/16 09:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/25/16 14:47	1
Ethylbenzene	0.98	J	1.0	0.26	ug/L			10/25/16 14:47	1
Toluene	1.6		1.0	0.23	ug/L			10/25/16 14:47	1
Xylenes, Total	11		2.0	0.24	ug/L			10/25/16 14:47	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	96		63 - 132		10/25/16 14:47	1
4-Bromofluorobenzene (Surr)	93		73 - 120		10/25/16 14:47	1
Toluene-d8 (Surr)	106		73 - 124		10/25/16 14:47	1
Dibromofluoromethane (Surr)	101		80 - 120		10/25/16 14:47	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	32		0.76	0.24	ug/L		10/20/16 14:26	10/22/16 20:15	4

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	44		42 - 120	10/20/16 14:26	10/22/16 20:15	4
2-Fluorophenol (Surr)	31		10 - 120	10/20/16 14:26	10/22/16 20:15	4
2,4,6-Tribromophenol (Surr)	52		35 - 125	10/20/16 14:26	10/22/16 20:15	4
Nitrobenzene-d5 (Surr)	70		36 - 120	10/20/16 14:26	10/22/16 20:15	4
Phenol-d5 (Surr)	19		10 - 120	10/20/16 14:26	10/22/16 20:15	4
Terphenyl-d14 (Surr)	54		17 - 120	10/20/16 14:26	10/22/16 20:15	4

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	0.32	J B	0.50	0.080	ug/L			10/26/16 17:46	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	86		76 - 121		10/26/16 17:46	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	20000		1200	190	ug/L		10/18/16 15:30	10/25/16 09:06	50000

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	0	X ^c D	18 - 125	10/18/16 15:30	10/25/16 09:06	50000

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.35	J	5.0	0.35	ug/L		10/17/16 14:00	10/19/16 00:22	1
Copper	2.6	B	2.0	0.36	ug/L		10/17/16 14:00	10/19/16 00:22	1
Iron	1970	B	100	5.3	ug/L		10/17/16 14:00	10/19/16 00:22	1
Manganese	3220		5.0	0.25	ug/L		10/17/16 14:00	10/19/16 00:22	1
Zinc	<6.2		20.0	6.2	ug/L		10/17/16 14:00	10/19/16 00:22	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	83.0		5.0	1.9	mg/L			10/21/16 20:32	1
Hardness as calcium carbonate	124		5.0	3.1	mg/L			10/19/16 09:06	1
Chloride	15.9		1.0	0.41	mg/L			10/15/16 17:57	1
Nitrate as N	<0.035		0.10	0.035	mg/L			10/15/16 17:57	1

TestAmerica Canton

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70898-1

Client Sample ID: W-161014-PS-24

Lab Sample ID: 240-70898-2

Date Collected: 10/14/16 09:10

Matrix: Water

Date Received: 10/15/16 09:40

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	16.3		1.0	0.13	mg/L			10/15/16 17:57	1
Total Organic Carbon	56.9	^	1.0	0.080	mg/L			10/17/16 14:23	1

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Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70898-1

Client Sample ID: TRIP BLANK 004

Lab Sample ID: 240-70898-3

Date Collected: 10/14/16 10:00

Matrix: Water

Date Received: 10/15/16 09:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/25/16 13:58	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/25/16 13:58	1
Toluene	<0.23		1.0	0.23	ug/L			10/25/16 13:58	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/25/16 13:58	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	94		63 - 132		10/25/16 13:58	1
4-Bromofluorobenzene (Surr)	88		73 - 120		10/25/16 13:58	1
Toluene-d8 (Surr)	102		73 - 124		10/25/16 13:58	1
Dibromofluoromethane (Surr)	99		80 - 120		10/25/16 13:58	1

Surrogate Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70898-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		12DCE (63-132)	BFB (73-120)	TOL (73-124)	DBFM (80-120)
240-70898-1	W-161014-PS-23	97	92	105	98
240-70898-2	W-161014-PS-24	96	93	106	101
240-70898-3	TRIP BLANK 004	94	88	102	99
LCS 240-252868/5	Lab Control Sample	95	91	103	98
MB 240-252868/8	Method Blank	98	88	101	98

Surrogate Legend

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

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)					
		FBP (42-120)	2FP (10-120)	TBP (35-125)	NBZ (36-120)	PHL (10-120)	TPH (17-120)
240-70898-1	W-161014-PS-23	38 X	28	49	61	18	47
240-70898-2	W-161014-PS-24	44	31	52	70	19	54
LCS 240-252384/20-A	Lab Control Sample	83	58	83	83	42	96
MB 240-252384/19-A	Method Blank	85	80	84	95	59	107

Surrogate Legend

FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14 (Surr)

Method: RSK-175 - Dissolved Gases (GC)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)
		Trifluoroet (76-121)
240-70898-1	W-161014-PS-23	84
240-70898-2	W-161014-PS-24	86
LCS 240-253107/5	Lab Control Sample	87
MB 240-253107/4	Method Blank	90

Surrogate Legend

1,1,1-Trifluoroethane = 1,1,1-Trifluoroethane

Surrogate Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70898-1

Method: 8151A - Herbicides (GC)

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	DCPA1 (18-125)	DCPA2 (18-125)
240-70898-1	W-161014-PS-23	0 X ^c D	0 X D
240-70898-2	W-161014-PS-24	0 X ^c D	0 X D
LCS 180-191589/2-A	Lab Control Sample	34	38
LCSD 180-191589/3-A	Lab Control Sample Dup	43	49
MB 180-191589/1-A	Method Blank	34	39

Surrogate Legend

DCPA = 2,4-Dichlorophenylacetic acid

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QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70898-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-252868/8
Matrix: Water
Analysis Batch: 252868

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/25/16 11:39	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/25/16 11:39	1
Toluene	<0.23		1.0	0.23	ug/L			10/25/16 11:39	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/25/16 11:39	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	98		63 - 132		10/25/16 11:39	1
4-Bromofluorobenzene (Surr)	88		73 - 120		10/25/16 11:39	1
Toluene-d8 (Surr)	101		73 - 124		10/25/16 11:39	1
Dibromofluoromethane (Surr)	98		80 - 120		10/25/16 11:39	1

Lab Sample ID: LCS 240-252868/5
Matrix: Water
Analysis Batch: 252868

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	20.0	20.8		ug/L		104	80 - 120
Ethylbenzene	20.0	21.6		ug/L		108	80 - 120
Toluene	20.0	21.7		ug/L		108	80 - 121
Xylenes, Total	40.0	41.7		ug/L		104	80 - 120
m-Xylene & p-Xylene	20.0	21.1		ug/L		105	80 - 120
o-Xylene	20.0	20.6		ug/L		103	80 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	95		63 - 132
4-Bromofluorobenzene (Surr)	91		73 - 120
Toluene-d8 (Surr)	103		73 - 124
Dibromofluoromethane (Surr)	98		80 - 120

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-252384/19-A
Matrix: Water
Analysis Batch: 252606

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 252384

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.063		0.20	0.063	ug/L		10/20/16 14:26	10/22/16 10:57	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	85		42 - 120	10/20/16 14:26	10/22/16 10:57	1
2-Fluorophenol (Surr)	80		10 - 120	10/20/16 14:26	10/22/16 10:57	1
2,4,6-Tribromophenol (Surr)	84		35 - 125	10/20/16 14:26	10/22/16 10:57	1
Nitrobenzene-d5 (Surr)	95		36 - 120	10/20/16 14:26	10/22/16 10:57	1
Phenol-d5 (Surr)	59		10 - 120	10/20/16 14:26	10/22/16 10:57	1
Terphenyl-d14 (Surr)	107		17 - 120	10/20/16 14:26	10/22/16 10:57	1

TestAmerica Canton

QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70898-1

Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-252384/20-A
Matrix: Water
Analysis Batch: 252606

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 252384

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Naphthalene	20.0	15.7		ug/L		78	54 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2-Fluorobiphenyl (Surr)	83		42 - 120
2-Fluorophenol (Surr)	58		10 - 120
2,4,6-Tribromophenol (Surr)	83		35 - 125
Nitrobenzene-d5 (Surr)	83		36 - 120
Phenol-d5 (Surr)	42		10 - 120
Terphenyl-d14 (Surr)	96		17 - 120

Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 240-253107/4
Matrix: Water
Analysis Batch: 253107

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	0.0844	J	0.50	0.080	ug/L			10/26/16 15:30	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	90		76 - 121		10/26/16 15:30	1

Lab Sample ID: LCS 240-253107/5
Matrix: Water
Analysis Batch: 253107

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Methane	199	204		ug/L		103	80 - 130

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,1,1-Trifluoroethane	87		76 - 121

Method: 8151A - Herbicides (GC)

Lab Sample ID: MB 180-191589/1-A
Matrix: Water
Analysis Batch: 191929

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 191589

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.016		0.10	0.016	ug/L		10/18/16 15:30	10/21/16 22:01	4

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	39		18 - 125	10/18/16 15:30	10/21/16 22:01	4

TestAmerica Canton

QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70898-1

Method: 8151A - Herbicides (GC) (Continued)

Lab Sample ID: LCS 180-191589/2-A
Matrix: Water
Analysis Batch: 191929

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 191589

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Pentachlorophenol	5.00	5.13		ug/L		103	30 - 150
Surrogate	%Recovery	LCS Qualifier	Limits				
2,4-Dichlorophenylacetic acid	38		18 - 125				

Lab Sample ID: LCSD 180-191589/3-A
Matrix: Water
Analysis Batch: 192136

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 191589

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Pentachlorophenol	5.00	5.28		ug/L		106	30 - 150	3	35
Surrogate	%Recovery	LCSD Qualifier	Limits						
2,4-Dichlorophenylacetic acid	49		18 - 125						

Method: 6020 - Metals (ICP/MS)

Lab Sample ID: MB 240-251725/1-A
Matrix: Water
Analysis Batch: 252056

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 251725

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.35		5.0	0.35	ug/L		10/17/16 14:00	10/18/16 23:22	1
Copper	0.563	J	2.0	0.36	ug/L		10/17/16 14:00	10/18/16 23:22	1
Iron	11.64	J	100	5.3	ug/L		10/17/16 14:00	10/18/16 23:22	1
Manganese	<0.25		5.0	0.25	ug/L		10/17/16 14:00	10/18/16 23:22	1
Zinc	<6.2		20.0	6.2	ug/L		10/17/16 14:00	10/18/16 23:22	1

Lab Sample ID: LCS 240-251725/3-A
Matrix: Water
Analysis Batch: 252056

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 251725

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Arsenic	1000	965.3		ug/L		97	80 - 120
Copper	1000	1041		ug/L		104	80 - 120
Iron	10000	10080		ug/L		101	80 - 120
Manganese	1000	1007		ug/L		101	80 - 120
Zinc	1000	1068		ug/L		107	80 - 120

Method: 2320B-1997 - Alkalinity, Total

Lab Sample ID: MB 240-252695/5
Matrix: Water
Analysis Batch: 252695

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	<1.9		5.0	1.9	mg/L			10/21/16 15:10	1

TestAmerica Canton

QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70898-1

Method: 2320B-1997 - Alkalinity, Total (Continued)

Lab Sample ID: LCS 240-252695/4
Matrix: Water
Analysis Batch: 252695

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	368	368.7		mg/L		100	86 - 123

Method: 2340C-1997 - Hardness, Total

Lab Sample ID: MB 240-252065/1
Matrix: Water
Analysis Batch: 252065

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	<3.1		5.0	3.1	mg/L			10/19/16 07:51	1

Lab Sample ID: LCS 240-252065/2
Matrix: Water
Analysis Batch: 252065

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Hardness as calcium carbonate	170	162.0		mg/L		95	80 - 120

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 240-251678/3
Matrix: Water
Analysis Batch: 251678

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.41		1.0	0.41	mg/L			10/15/16 13:15	1
Sulfate	<0.13		1.0	0.13	mg/L			10/15/16 13:15	1

Lab Sample ID: LCS 240-251678/4
Matrix: Water
Analysis Batch: 251678

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.66		mg/L		101	90 - 110
Sulfate	50.0	51.94		mg/L		104	90 - 110

Lab Sample ID: MB 240-251679/3
Matrix: Water
Analysis Batch: 251679

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	<0.035		0.10	0.035	mg/L			10/15/16 13:15	1

Lab Sample ID: LCS 240-251679/4
Matrix: Water
Analysis Batch: 251679

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	2.50	2.57		mg/L		103	90 - 110

TestAmerica Canton

QC Sample Results

Client: GHD Services Inc.
 Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70898-1

Method: 9060 - Organic Carbon, Total (TOC)

Lab Sample ID: MB 240-251836/4
Matrix: Water
Analysis Batch: 251836

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	<0.080		1.0	0.080	mg/L			10/17/16 11:07	1

Lab Sample ID: LCS 240-251836/6
Matrix: Water
Analysis Batch: 251836

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	46.3	46.28		mg/L		100	80 - 120

Lab Sample ID: LLCS 240-251836/5
Matrix: Water
Analysis Batch: 251836

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

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	4.63	4.38		mg/L		95	88 - 115

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QC Association Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70898-1

GC/MS VOA

Analysis Batch: 252868

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70898-1	W-161014-PS-23	Total/NA	Water	8260B	
240-70898-2	W-161014-PS-24	Total/NA	Water	8260B	
240-70898-3	TRIP BLANK 004	Total/NA	Water	8260B	
MB 240-252868/8	Method Blank	Total/NA	Water	8260B	
LCS 240-252868/5	Lab Control Sample	Total/NA	Water	8260B	

GC/MS Semi VOA

Prep Batch: 252384

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70898-1	W-161014-PS-23	Total/NA	Water	3510C	
240-70898-2	W-161014-PS-24	Total/NA	Water	3510C	
MB 240-252384/19-A	Method Blank	Total/NA	Water	3510C	
LCS 240-252384/20-A	Lab Control Sample	Total/NA	Water	3510C	

Analysis Batch: 252606

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70898-1	W-161014-PS-23	Total/NA	Water	8270C	252384
240-70898-2	W-161014-PS-24	Total/NA	Water	8270C	252384
MB 240-252384/19-A	Method Blank	Total/NA	Water	8270C	252384
LCS 240-252384/20-A	Lab Control Sample	Total/NA	Water	8270C	252384

GC VOA

Analysis Batch: 253107

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70898-1	W-161014-PS-23	Total/NA	Water	RSK-175	
240-70898-2	W-161014-PS-24	Total/NA	Water	RSK-175	
MB 240-253107/4	Method Blank	Total/NA	Water	RSK-175	
LCS 240-253107/5	Lab Control Sample	Total/NA	Water	RSK-175	

GC Semi VOA

Prep Batch: 191589

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70898-1	W-161014-PS-23	Total/NA	Water	8151A	
240-70898-2	W-161014-PS-24	Total/NA	Water	8151A	
MB 180-191589/1-A	Method Blank	Total/NA	Water	8151A	
LCS 180-191589/2-A	Lab Control Sample	Total/NA	Water	8151A	
LCSD 180-191589/3-A	Lab Control Sample Dup	Total/NA	Water	8151A	

Analysis Batch: 191929

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 180-191589/1-A	Method Blank	Total/NA	Water	8151A	191589
LCS 180-191589/2-A	Lab Control Sample	Total/NA	Water	8151A	191589

Analysis Batch: 192136

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70898-1	W-161014-PS-23	Total/NA	Water	8151A	191589
240-70898-2	W-161014-PS-24	Total/NA	Water	8151A	191589

TestAmerica Canton

QC Association Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70898-1

GC Semi VOA (Continued)

Analysis Batch: 192136 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS D 180-191589/3-A	Lab Control Sample Dup	Total/NA	Water	8151A	191589

Metals

Prep Batch: 251725

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70898-1	W-161014-PS-23	Dissolved	Water	3005A	
240-70898-2	W-161014-PS-24	Dissolved	Water	3005A	
MB 240-251725/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-251725/3-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 252056

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70898-1	W-161014-PS-23	Dissolved	Water	6020	251725
240-70898-2	W-161014-PS-24	Dissolved	Water	6020	251725
MB 240-251725/1-A	Method Blank	Total Recoverable	Water	6020	251725
LCS 240-251725/3-A	Lab Control Sample	Total Recoverable	Water	6020	251725

General Chemistry

Analysis Batch: 251678

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70898-1	W-161014-PS-23	Total/NA	Water	300.0	
240-70898-2	W-161014-PS-24	Total/NA	Water	300.0	
MB 240-251678/3	Method Blank	Total/NA	Water	300.0	
LCS 240-251678/4	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 251679

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70898-1	W-161014-PS-23	Total/NA	Water	300.0	
240-70898-2	W-161014-PS-24	Total/NA	Water	300.0	
MB 240-251679/3	Method Blank	Total/NA	Water	300.0	
LCS 240-251679/4	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 251836

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70898-1	W-161014-PS-23	Total/NA	Water	9060	
240-70898-2	W-161014-PS-24	Total/NA	Water	9060	
MB 240-251836/4	Method Blank	Total/NA	Water	9060	
LCS 240-251836/6	Lab Control Sample	Total/NA	Water	9060	
LLCS 240-251836/5	Lab Control Sample	Total/NA	Water	9060	

Analysis Batch: 252065

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70898-1	W-161014-PS-23	Total/NA	Water	2340C-1997	
240-70898-2	W-161014-PS-24	Total/NA	Water	2340C-1997	
MB 240-252065/1	Method Blank	Total/NA	Water	2340C-1997	
LCS 240-252065/2	Lab Control Sample	Total/NA	Water	2340C-1997	

TestAmerica Canton

QC Association Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70898-1

General Chemistry (Continued)

Analysis Batch: 252695

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70898-1	W-161014-PS-23	Total/NA	Water	2320B-1997	
240-70898-2	W-161014-PS-24	Total/NA	Water	2320B-1997	
MB 240-252695/5	Method Blank	Total/NA	Water	2320B-1997	
LCS 240-252695/4	Lab Control Sample	Total/NA	Water	2320B-1997	

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Lab Chronicle

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70898-1

Client Sample ID: W-161014-PS-23

Date Collected: 10/14/16 08:20

Date Received: 10/15/16 09:40

Lab Sample ID: 240-70898-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	252868	10/25/16 14:23	HMB	TAL CAN
Total/NA	Prep	3510C			252384	10/20/16 14:26	CS	TAL CAN
Total/NA	Analysis	8270C		1	252606	10/22/16 19:52	JMG	TAL CAN
Total/NA	Analysis	RSK-175		1	253107	10/26/16 17:29	BPM	TAL CAN
Total/NA	Prep	8151A			191589	10/18/16 15:30	CBY	TAL PIT
Total/NA	Analysis	8151A		10000	192136	10/25/16 08:42	JMO	TAL PIT
Dissolved	Prep	3005A			251725	10/17/16 14:00	AJC	TAL CAN
Dissolved	Analysis	6020		1	252056	10/19/16 00:18	DSH	TAL CAN
Total/NA	Analysis	2320B-1997		1	252695	10/21/16 20:25	LKG	TAL CAN
Total/NA	Analysis	2340C-1997		1	252065	10/19/16 09:00	TPH	TAL CAN
Total/NA	Analysis	300.0		1	251678	10/15/16 17:37	LKG	TAL CAN
Total/NA	Analysis	300.0		1	251679	10/15/16 17:37	LKG	TAL CAN
Total/NA	Analysis	9060		1	251836	10/17/16 13:10	TPH	TAL CAN

Client Sample ID: W-161014-PS-24

Date Collected: 10/14/16 09:10

Date Received: 10/15/16 09:40

Lab Sample ID: 240-70898-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	252868	10/25/16 14:47	HMB	TAL CAN
Total/NA	Prep	3510C			252384	10/20/16 14:26	CS	TAL CAN
Total/NA	Analysis	8270C		4	252606	10/22/16 20:15	JMG	TAL CAN
Total/NA	Analysis	RSK-175		1	253107	10/26/16 17:46	BPM	TAL CAN
Total/NA	Prep	8151A			191589	10/18/16 15:30	CBY	TAL PIT
Total/NA	Analysis	8151A		50000	192136	10/25/16 09:06	JMO	TAL PIT
Dissolved	Prep	3005A			251725	10/17/16 14:00	AJC	TAL CAN
Dissolved	Analysis	6020		1	252056	10/19/16 00:22	DSH	TAL CAN
Total/NA	Analysis	2320B-1997		1	252695	10/21/16 20:32	LKG	TAL CAN
Total/NA	Analysis	2340C-1997		1	252065	10/19/16 09:06	TPH	TAL CAN
Total/NA	Analysis	300.0		1	251678	10/15/16 17:57	LKG	TAL CAN
Total/NA	Analysis	300.0		1	251679	10/15/16 17:57	LKG	TAL CAN
Total/NA	Analysis	9060		1	251836	10/17/16 14:23	TPH	TAL CAN

Client Sample ID: TRIP BLANK 004

Date Collected: 10/14/16 10:00

Date Received: 10/15/16 09:40

Lab Sample ID: 240-70898-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	252868	10/25/16 13:58	HMB	TAL CAN

TestAmerica Canton

Lab Chronicle

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70898-1

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

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Certification Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70898-1

Laboratory: TestAmerica Canton

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Wisconsin	State Program	5	999518190	08-31-17

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
RSK-175		Water	Methane

Laboratory: TestAmerica Pittsburgh

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Wisconsin	State Program	5	998027800	08-31-17



TestAmerica Canton
 4101 Shuffel Street NW
 North Canton, OH 44720
 Phone (330) 497-9396 Fax (330) 497-0772

2.8/C3.2

Chain of Custody Record

TestAmerica
 THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Peter Starlie	Lab PM: Heckler, Denise D	Carrier Tracking No(s):	COC No: 240-37524-16441.5
Client Contact: Mr. Grant Anderson	Phone: 651-247-4218	E-Mail: denise.heckler@testamericainc.com		Page: Page 5 of 5
Company: GHD Services Inc.	Analysis Requested			Job #:

Address: 1801 Old Highway 8 NW Suite 114	Due Date Requested:
City: St. Paul	TAT Requested (days): STANDARD
State, Zip: MN, 55112	
Phone: 651-639-0913(Tel) 651-639-0923(Fax)	PO #: 34001059
Email: grant.anderson@ghd.com	WO #: 86165
Project Name: 86165-03-11, Penta Wood	Project #: 24012755
Site:	SSOW#:

Barcode: 240-70898 Chain of Custody

Field Filtered Sample (Yes or No):

Perform MS/MSD (Yes or No):

8260B - BTEX

8270C - Naphthalene

6020 - As,Cu,Zn,Fe,Mn--dis--field filter

8260B - BTEX

8151A - Pentachlorophenol

Total Number of Containers:

Preservation Codes:	
ICL	M - Hexane
laOH	N - None
n Acetate	O - AsNaO2
litric Acid	P - Na2O4S
laHSO4	Q - Na2SO3
leOH	R - Na2S2O3
umchlor	S - H2SO4
corbic Acid	T - TSP Dodecahydrate
Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)
Other:	

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260B - BTEX	8270C - Naphthalene	6020 - As,Cu,Zn,Fe,Mn--dis--field filter	8260B - BTEX	8151A - Pentachlorophenol	Total Number of Containers	Special Instructions/Note:
W-161014-PS-23	10-14-16	0820	G	Water	X	X	X	X	X	X	X	7	Note: Nitrate 48-hr Analysis
W-161014-PS-24	↓	0910	G	Water	X	X	X	X	X	X	7		
Trip Blank 004		1000	G	Water	X								
/	/	/	/	Water	/	/	/	/	/	/	/	/	/
/	/	/	/	Water	/	/	/	/	/	/	/	/	/
/	/	/	/	Water	/	/	/	/	/	/	/	/	/
/	/	/	/	Water	/	/	/	/	/	/	/	/	/
/	/	/	/	Water	/	/	/	/	/	/	/	/	/

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

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by: <i>[Signature]</i>	Date/Time: 10-14-16 / 1200	Company: GHP	Received by: <i>[Signature]</i> Date/Time: 10-15-16 940
Relinquished by:	Date/Time:	Company:	Received by:
Relinquished by:	Date/Time:	Company:	Received by:
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:	

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10/27/2016



TestAmerica Canton
 4101 Shuffel Street NW
 North Canton, OH 44720
 Phone (330) 497-9396 Fax (330) 497-0772

Chain of Custody Record

COLUMBUS
 240507

TestAmerica
 THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Peter Storke	Lab PM: Heckler, Denise D	Carrier Tracking No(s):	COC No: 240-37523-16440.3
Client Contact: Mr. Grant Anderson	Phone: 651-247-4218	E-Mail: denise.heckler@testamericainc.com		Page: Page 3 of 3

Company: GHD Services Inc.	Due Date Requested:	Analysis Requested				Job #:				
Address: 1801 Old Highway 8 NW Suite 114	TAT Requested (days):	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2320B - Alkalinity	2340C - Hardness as calcium carbonate	RSK_176 - Methane	9060 - TOC	300 - Nitrate, Chloride, Sulfate	Total Number of containers	Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)
City: St. Paul	PO #: 34001059									
State, Zip: MN, 55112	WO #: 86165									
Phone: 651-639-0913(Tel) 651-639-0923(Fax)	Project #: 24012755									
Email: grant.anderson@ghd.com	SSOW#:	Other:								

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/soil)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2320B - Alkalinity	2340C - Hardness as calcium carbonate	RSK_176 - Methane	9060 - TOC	300 - Nitrate, Chloride, Sulfate	Total Number of containers	Special Instructions/Note:
W-161014-PS-23	10.14.16	0820	G	Water	X	X	X	X	X	X	X		Note: Nitrate 48-hr analysis.
W-161014-PS-24	10.14.16	0910	G	Water	X	X	X	X	X	X	X		
W-161014-PS-25				Water									
/				Water									
/				Water									
/				Water									
/				Water									

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

Empty Kit Relinquished by: <i>[Signature]</i>	Date: 10-14-16 / 1200	Company: GHD	Received by: <i>[Signature]</i>	Date/Time: 10-15-16 940	Company: TA
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:			

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10/27/2016



TestAmerica Canton Sample Receipt Form/Narrative

Login #: 70898

Canton Facility

Client GAD Site Name
Cooler Received on 10-15-16 Opened on 10-15-16
FedEx: 1st Grd Exp UPS FAS Stetson Client Drop Off TestAmerica Courier Other

Cooler unpacked by: Ryan Henderson

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # Foam Box Client Cooler Box Other
Packing material used: Bubble Wrap Foam Plastic Bag None Other
COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt
IR GUN#IR-87 (CF +0.4 °C) Observed Cooler Temp. 2.8 °C Corrected Cooler Temp. 3.2 °C
IR GUN#36 (CF +1.3 °C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were custody seals on the outside of the cooler(s)? If Yes Quantity 2 Yes No
-Were custody seals on the outside of the cooler(s) signed & dated? Yes No NA
-Were custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No

3. Shippers' packing slip attached to the cooler(s)? Yes No

4. Did custody papers accompany the sample(s)? Yes No

5. Were the custody papers relinquished & signed in the appropriate place? Yes No

6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No

7. Did all bottles arrive in good condition (Unbroken)? Yes No

8. Could all bottle labels be reconciled with the COC? Yes No

9. Were correct bottle(s) used for the test(s) indicated? Yes No

10. Sufficient quantity received to perform indicated analyses? Yes No

11. Are these work share samples? Yes No

If yes, Questions 11-15 have been checked at the originating laboratory.

11. Were sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC574756

12. Were VOAs on the COC? Yes No

13. Were air bubbles >6 mm in any VOA vials? Yes No NA

14. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # B615201VB Yes No

15. Was a LL Hg or Me Hg trip blank present? Yes No

Contacted PM Date by via Verbal Voice Mail Other

Concerning

14. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by:

Blank lines for Chain of Custody and Sample Discrepancies.

15. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

16. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

Temperature readings: _____

<u>Client Sample ID</u>	<u>Lab ID</u>	<u>Container Type</u>	<u>Container pH</u>	<u>Preservative Added (mls)</u>	<u>Lot #</u>
W-161014-PS-23	240-70898-H-1	Plastic 250ml - with Nitric Acid	<2	_____	_____
W-161014-PS-23	240-70898-J-1	Plastic 500ml - with Sulfuric Acid	<2	_____	_____
W-161014-PS-23	240-70898-K-1	Plastic 500ml - with Nitric Acid	<2	_____	_____
W-161014-PS-24	240-70898-H-2	Plastic 250ml - with Nitric Acid	<2	_____	_____
W-161014-PS-24	240-70898-J-2	Plastic 500ml - with Sulfuric Acid	<2	_____	_____
W-161014-PS-24	240-70898-K-2	Plastic 500ml - with Nitric Acid	<2	_____	_____

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Login Sample Receipt Checklist

Client: GHD Services Inc.

Job Number: 240-70898-1

Login Number: 70898

List Number: 2

Creator: Neri, Tom

List Source: TestAmerica Pittsburgh

List Creation: 10/18/16 12:40 PM

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	2.3
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Canton

4101 Shuffel Street NW

North Canton, OH 44720

Tel: (330)497-9396

TestAmerica Job ID: 240-70899-1

Client Project/Site: 86165-03-11, Penta Wood

For:

GHD Services Inc.

1801 Old Highway 8 NW

Suite 114

St. Paul, Minnesota 55112

Attn: Mr. Grant Anderson



Authorized for release by:

10/28/2016 7:59:04 AM

Denise Heckler, Project Manager II

(330)966-9477

denise.heckler@testamericainc.com

LINKS

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results through

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Have a Question?



Visit us at:

www.testamericainc.com

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

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

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Definitions/Glossary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Reported value was between the limit of detection and the limit of quantitation.

GC/MS Semi VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
J	Reported value was between the limit of detection and the limit of quantitation.
H	Sample was prepped or analyzed beyond the specified holding time
X	Surrogate is outside control limits
*	ISTD response or retention time outside acceptable limits

GC VOA

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Reported value was between the limit of detection and the limit of quantitation.

GC Semi VOA

Qualifier	Qualifier Description
^c	CCV Recovery is outside acceptance limits.
D	Surrogate or matrix spike recoveries were not obtained because the extract was diluted for analysis; also compounds analyzed at a dilution may be flagged with a D.
X	Surrogate is outside control limits

Metals

Qualifier	Qualifier Description
J	Reported value was between the limit of detection and the limit of quantitation.
B	Compound was found in the blank and sample.

General Chemistry

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.
J	Reported value was between the limit of detection and the limit of quantitation.

Glossary

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

TestAmerica Canton

Definitions/Glossary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

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Case Narrative

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Job ID: 240-70899-1

Laboratory: TestAmerica Canton

Narrative

Job Narrative 240-70899-1

Comments

No additional comments.

Receipt

The samples were received on 10/15/2016 9:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 1.4° C, 1.6° C and 4.2° C.

GC/MS VOA

Method(s) 8260B: The reporting limit (RL) provided for certain analyte(s) falls below the laboratory's verified standard quantitation limit: W-161013-PS-16 (240-70899-1), W-161013-PS-17 (240-70899-2), W-161013-PS-18 (240-70899-3), W-161013-PS-19 (240-70899-4), W-161013-PS-20 (240-70899-5), W-161013-PS-21 (240-70899-6), W-161013-PS-22 (240-70899-7) and TRIP BLANK 003 (240-70899-8). Results reported below the verified standard quantitation limit have less certainty (i.e., are estimated) and must be used at the clients discretion. The continuing calibration blanks and method blanks may not support the lower RL.

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

GC/MS Semi VOA

Method(s) 8270C: The following samples were diluted due to the nature of the sample matrix: W-161013-PS-19 (240-70899-4) and W-161013-PS-20 (240-70899-5). Elevated reporting limits (RLs) are provided.

Method(s) 8270C: Acid surrogate(s) were out of control for samples W-161013-PS-18 (240-70899-3), W-161013-PS-19 (240-70899-4) and W-161013-PS-21 (240-70899-6). However, since only BN compounds were requested no corrective action was required.

Method(s) 8270C: The laboratory control sample (LCS) for 52314 recovered outside control limits for the following analyte: Naphthalene. The associated samples W-161013-PS-16 (240-70899-1), W-161013-PS-17 (240-70899-2), W-161013-PS-18 (240-70899-3), W-161013-PS-19 (240-70899-4), W-161013-PS-20 (240-70899-5), W-161013-PS-21 (240-70899-6) and W-161013-PS-22 (240-70899-7) was re-prepared and/or re-analyzed outside holding time. Both sets of data have been reported.

Method(s) 8270C: Internal standard responses were outside of acceptance limits for the following sample: W-161013-PS-19 (240-70899-4). The sample shows evidence of matrix interference.

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

GC VOA

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

GC Semi VOA

Method(s) 8151A: The following samples was diluted due to the abundance of target analytes: W-161013-PS-16 (240-70899-1), W-161013-PS-19 (240-70899-4) and W-161013-PS-20 (240-70899-5)

Method(s) 8151A: The following samples was diluted due to the abundance of target analytes: W-161013-PS-17 (240-70899-2) and W-161013-PS-18 (240-70899-3)

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

Metals

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

General Chemistry

Method(s) 300.0: The following sample(s) was received with less than 2 days remaining on the holding time or less than one shift (8 hours) remaining on a test with a holding time of 48 hours or less. As such, the laboratory had insufficient time remaining to perform the analysis within holding time: W-161013-PS-16 (240-70899-1), W-161013-PS-17 (240-70899-2), W-161013-PS-18 (240-70899-3),

Case Narrative

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Job ID: 240-70899-1 (Continued)

Laboratory: TestAmerica Canton (Continued)

W-161013-PS-19 (240-70899-4), W-161013-PS-20 (240-70899-5) and W-161013-PS-22 (240-70899-7).

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

Organic Prep

Method(s) 3510C, 625: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 240-252314.

Method(s) 3510C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 240-252867.

Method(s) 8151A: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with preparation batch 180-191589.

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

VOA Prep

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



Method Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8270C	Semivolatile Organic Compounds (GC/MS)	SW846	TAL CAN
RSK-175	Dissolved Gases (GC)	RSK	TAL CAN
8151A	Herbicides (GC)	SW846	TAL PIT
6020	Metals (ICP/MS)	SW846	TAL CAN
2320B-1997	Alkalinity, Total	SM	TAL CAN
2340C-1997	Hardness, Total	SM	TAL CAN
300.0	Anions, Ion Chromatography	MCAWW	TAL CAN
9060	Organic Carbon, Total (TOC)	SW846	TAL CAN

Protocol References:

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

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

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

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

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-70899-1	W-161013-PS-16	Water	10/13/16 09:10	10/15/16 09:40
240-70899-2	W-161013-PS-17	Water	10/13/16 09:20	10/15/16 09:40
240-70899-3	W-161013-PS-18	Water	10/13/16 10:15	10/15/16 09:40
240-70899-4	W-161013-PS-19	Water	10/13/16 11:00	10/15/16 09:40
240-70899-5	W-161013-PS-20	Water	10/13/16 11:40	10/15/16 09:40
240-70899-6	W-161013-PS-21	Water	10/13/16 12:45	10/15/16 09:40
240-70899-7	W-161013-PS-22	Water	10/13/16 13:10	10/15/16 09:40
240-70899-8	TRIP BLANK 003	Water	10/13/16 14:00	10/15/16 09:40

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Detection Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Client Sample ID: W-161013-PS-16

Lab Sample ID: 240-70899-1

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Xylenes, Total	1.4	J	2.0	0.24	ug/L	1		8260B	Total/NA
Naphthalene	0.12	J*	0.19	0.061	ug/L	1		8270C	Total/NA
Methane	0.28	J B	0.50	0.080	ug/L	1		RSK-175	Total/NA
Pentachlorophenol	1900		240	37	ug/L	10000		8151A	Total/NA
Arsenic	0.39	J	5.0	0.35	ug/L	1		6020	Dissolved
Copper	0.76	J B	2.0	0.36	ug/L	1		6020	Dissolved
Iron	9.8	J B	100	5.3	ug/L	1		6020	Dissolved
Manganese	8.5		5.0	0.25	ug/L	1		6020	Dissolved
Alkalinity	128		5.0	1.9	mg/L	1		2320B-1997	Total/NA
Hardness as calcium carbonate	148		5.0	3.1	mg/L	1		2340C-1997	Total/NA
Chloride	11.4		1.0	0.41	mg/L	1		300.0	Total/NA
Nitrate as N	1.7	H	0.10	0.035	mg/L	1		300.0	Total/NA
Sulfate	5.8		1.0	0.13	mg/L	1		300.0	Total/NA
Total Organic Carbon	12.3	^	2.0	0.16	mg/L	2		9060	Total/NA

Client Sample ID: W-161013-PS-17

Lab Sample ID: 240-70899-2

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Xylenes, Total	1.4	J	2.0	0.24	ug/L	1		8260B	Total/NA
Methane	0.36	J B	0.50	0.080	ug/L	1		RSK-175	Total/NA
Pentachlorophenol	1200		24	3.7	ug/L	1000		8151A	Total/NA
Arsenic	0.38	J	5.0	0.35	ug/L	1		6020	Dissolved
Copper	0.61	J B	2.0	0.36	ug/L	1		6020	Dissolved
Manganese	7.9		5.0	0.25	ug/L	1		6020	Dissolved
Alkalinity	125		5.0	1.9	mg/L	1		2320B-1997	Total/NA
Hardness as calcium carbonate	142		5.0	3.1	mg/L	1		2340C-1997	Total/NA
Chloride	11.4		1.0	0.41	mg/L	1		300.0	Total/NA
Nitrate as N	1.7	H	0.10	0.035	mg/L	1		300.0	Total/NA
Sulfate	5.6		1.0	0.13	mg/L	1		300.0	Total/NA
Total Organic Carbon	12.3	^	2.0	0.16	mg/L	2		9060	Total/NA

Client Sample ID: W-161013-PS-18

Lab Sample ID: 240-70899-3

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Methane	0.11	J B	0.50	0.080	ug/L	1		RSK-175	Total/NA
Pentachlorophenol	3.7		0.095	0.015	ug/L	4		8151A	Total/NA
Copper	0.76	J B	2.0	0.36	ug/L	1		6020	Dissolved
Alkalinity	110		5.0	1.9	mg/L	1		2320B-1997	Total/NA
Hardness as calcium carbonate	104		5.0	3.1	mg/L	1		2340C-1997	Total/NA
Chloride	0.63	J	1.0	0.41	mg/L	1		300.0	Total/NA
Nitrate as N	0.46	H	0.10	0.035	mg/L	1		300.0	Total/NA
Sulfate	1.5		1.0	0.13	mg/L	1		300.0	Total/NA
Total Organic Carbon	0.29	J ^	1.0	0.080	mg/L	1		9060	Total/NA

Client Sample ID: W-161013-PS-19

Lab Sample ID: 240-70899-4

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Ethylbenzene	0.79	J	1.0	0.26	ug/L	1		8260B	Total/NA
Toluene	0.79	J	1.0	0.23	ug/L	1		8260B	Total/NA
Xylenes, Total	5.7		2.0	0.24	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Canton

Detection Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Client Sample ID: W-161013-PS-19 (Continued)

Lab Sample ID: 240-70899-4

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Naphthalene	6.2	*	0.76	0.24	ug/L	4		8270C	Total/NA
Naphthalene - RE	5.4	H	0.19	0.060	ug/L	1		8270C	Total/NA
Methane	5.5	B	0.50	0.080	ug/L	1		RSK-175	Total/NA
Pentachlorophenol	7300		240	37	ug/L	10000		8151A	Total/NA
Arsenic	0.46	J	5.0	0.35	ug/L	1		6020	Dissolved
Copper	1.7	J B	2.0	0.36	ug/L	1		6020	Dissolved
Iron	434	B	100	5.3	ug/L	1		6020	Dissolved
Manganese	777		5.0	0.25	ug/L	1		6020	Dissolved
Alkalinity	156		5.0	1.9	mg/L	1		2320B-1997	Total/NA
Hardness as calcium carbonate	186		5.0	3.1	mg/L	1		2340C-1997	Total/NA
Chloride	14.6		1.0	0.41	mg/L	1		300.0	Total/NA
Sulfate	24.3		1.0	0.13	mg/L	1		300.0	Total/NA
Total Organic Carbon	11.1	^	1.0	0.080	mg/L	1		9060	Total/NA

Client Sample ID: W-161013-PS-20

Lab Sample ID: 240-70899-5

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Ethylbenzene	0.30	J	1.0	0.26	ug/L	1		8260B	Total/NA
Xylenes, Total	4.6		2.0	0.24	ug/L	1		8260B	Total/NA
Naphthalene	9.6	*	0.79	0.25	ug/L	4		8270C	Total/NA
Naphthalene - RE	8.4	H	0.20	0.062	ug/L	1		8270C	Total/NA
Methane	0.12	J B	0.50	0.080	ug/L	1		RSK-175	Total/NA
Pentachlorophenol	6600		240	38	ug/L	10000		8151A	Total/NA
Arsenic	0.44	J	5.0	0.35	ug/L	1		6020	Dissolved
Copper	4.6	B	2.0	0.36	ug/L	1		6020	Dissolved
Iron	124	B	100	5.3	ug/L	1		6020	Dissolved
Manganese	399		5.0	0.25	ug/L	1		6020	Dissolved
Alkalinity	83.7		5.0	1.9	mg/L	1		2320B-1997	Total/NA
Hardness as calcium carbonate	100		5.0	3.1	mg/L	1		2340C-1997	Total/NA
Chloride	6.1		1.0	0.41	mg/L	1		300.0	Total/NA
Sulfate	11.9		1.0	0.13	mg/L	1		300.0	Total/NA
Total Organic Carbon	12.3	^	1.0	0.080	mg/L	1		9060	Total/NA

Client Sample ID: W-161013-PS-21

Lab Sample ID: 240-70899-6

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Pentachlorophenol	0.15		0.097	0.015	ug/L	4		8151A	Total/NA
Copper	0.57	J B	2.0	0.36	ug/L	1		6020	Dissolved
Iron	15.6	J B	100	5.3	ug/L	1		6020	Dissolved
Manganese	0.31	J	5.0	0.25	ug/L	1		6020	Dissolved

Client Sample ID: W-161013-PS-22

Lab Sample ID: 240-70899-7

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Pentachlorophenol	0.20		0.095	0.015	ug/L	4		8151A	Total/NA
Arsenic	0.71	J	5.0	0.35	ug/L	1		6020	Dissolved
Copper	19.7	B	2.0	0.36	ug/L	1		6020	Dissolved
Iron	2290	B	100	5.3	ug/L	1		6020	Dissolved
Manganese	52.7		5.0	0.25	ug/L	1		6020	Dissolved
Zinc	11.7	J	20.0	6.2	ug/L	1		6020	Dissolved

This Detection Summary does not include radiochemical test results.

TestAmerica Canton

Detection Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Client Sample ID: W-161013-PS-22 (Continued)

Lab Sample ID: 240-70899-7

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Alkalinity	126		5.0	1.9	mg/L	1		2320B-1997	Total/NA
Hardness as calcium carbonate	152		5.0	3.1	mg/L	1		2340C-1997	Total/NA
Chloride	14.5		1.0	0.41	mg/L	1		300.0	Total/NA
Nitrate as N	6.9	H	0.10	0.035	mg/L	1		300.0	Total/NA
Sulfate	8.1		1.0	0.13	mg/L	1		300.0	Total/NA
Total Organic Carbon	4.2	^	1.0	0.080	mg/L	1		9060	Total/NA

Client Sample ID: TRIP BLANK 003

Lab Sample ID: 240-70899-8

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Canton

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Client Sample ID: W-161013-PS-16

Lab Sample ID: 240-70899-1

Date Collected: 10/13/16 09:10

Matrix: Water

Date Received: 10/15/16 09:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/25/16 15:00	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/25/16 15:00	1
Toluene	<0.23		1.0	0.23	ug/L			10/25/16 15:00	1
Xylenes, Total	1.4	J	2.0	0.24	ug/L			10/25/16 15:00	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	124		63 - 132		10/25/16 15:00	1
4-Bromofluorobenzene (Surr)	101		73 - 120		10/25/16 15:00	1
Toluene-d8 (Surr)	96		73 - 124		10/25/16 15:00	1
Dibromofluoromethane (Surr)	105		80 - 120		10/25/16 15:00	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	0.12	J*	0.19	0.061	ug/L		10/20/16 09:49	10/22/16 17:35	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	57		42 - 120	10/20/16 09:49	10/22/16 17:35	1
2-Fluorophenol (Surr)	33		10 - 120	10/20/16 09:49	10/22/16 17:35	1
2,4,6-Tribromophenol (Surr)	69		35 - 125	10/20/16 09:49	10/22/16 17:35	1
Nitrobenzene-d5 (Surr)	63		36 - 120	10/20/16 09:49	10/22/16 17:35	1
Phenol-d5 (Surr)	19		10 - 120	10/20/16 09:49	10/22/16 17:35	1
Terphenyl-d14 (Surr)	54		17 - 120	10/20/16 09:49	10/22/16 17:35	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS) - RE

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.060	H	0.19	0.060	ug/L		10/25/16 08:51	10/26/16 19:31	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	58		42 - 120	10/25/16 08:51	10/26/16 19:31	1
2-Fluorophenol (Surr)	29		10 - 120	10/25/16 08:51	10/26/16 19:31	1
2,4,6-Tribromophenol (Surr)	69		35 - 125	10/25/16 08:51	10/26/16 19:31	1
Nitrobenzene-d5 (Surr)	61		36 - 120	10/25/16 08:51	10/26/16 19:31	1
Phenol-d5 (Surr)	17		10 - 120	10/25/16 08:51	10/26/16 19:31	1
Terphenyl-d14 (Surr)	66		17 - 120	10/25/16 08:51	10/26/16 19:31	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	0.28	J B	0.50	0.080	ug/L			10/26/16 18:03	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	82		76 - 121		10/26/16 18:03	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	1900		240	37	ug/L		10/18/16 15:30	10/25/16 07:29	10000

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	0	X ^c D	18 - 125	10/18/16 15:30	10/25/16 07:29	10000
2,4-Dichlorophenylacetic acid	0	X D	18 - 125	10/18/16 15:30	10/25/16 07:29	10000

TestAmerica Canton

Client Sample Results

Client: GHD Services Inc.
 Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Client Sample ID: W-161013-PS-16

Lab Sample ID: 240-70899-1

Date Collected: 10/13/16 09:10

Matrix: Water

Date Received: 10/15/16 09:40

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.39	J	5.0	0.35	ug/L		10/17/16 14:00	10/19/16 00:35	1
Copper	0.76	J B	2.0	0.36	ug/L		10/17/16 14:00	10/19/16 00:35	1
Iron	9.8	J B	100	5.3	ug/L		10/17/16 14:00	10/19/16 00:35	1
Manganese	8.5		5.0	0.25	ug/L		10/17/16 14:00	10/19/16 00:35	1
Zinc	<6.2		20.0	6.2	ug/L		10/17/16 14:00	10/19/16 00:35	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	128		5.0	1.9	mg/L			10/20/16 14:33	1
Hardness as calcium carbonate	148		5.0	3.1	mg/L			10/19/16 09:17	1
Chloride	11.4		1.0	0.41	mg/L			10/15/16 14:35	1
Nitrate as N	1.7	H	0.10	0.035	mg/L			10/15/16 14:35	1
Sulfate	5.8		1.0	0.13	mg/L			10/15/16 14:35	1
Total Organic Carbon	12.3	^	2.0	0.16	mg/L			10/17/16 14:52	2

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Client Sample ID: W-161013-PS-17

Lab Sample ID: 240-70899-2

Date Collected: 10/13/16 09:20

Matrix: Water

Date Received: 10/15/16 09:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/25/16 15:22	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/25/16 15:22	1
Toluene	<0.23		1.0	0.23	ug/L			10/25/16 15:22	1
Xylenes, Total	1.4	J	2.0	0.24	ug/L			10/25/16 15:22	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	111		63 - 132		10/25/16 15:22	1
4-Bromofluorobenzene (Surr)	101		73 - 120		10/25/16 15:22	1
Toluene-d8 (Surr)	97		73 - 124		10/25/16 15:22	1
Dibromofluoromethane (Surr)	100		80 - 120		10/25/16 15:22	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.060	*	0.19	0.060	ug/L		10/20/16 09:49	10/22/16 18:00	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	61		42 - 120	10/20/16 09:49	10/22/16 18:00	1
2-Fluorophenol (Surr)	36		10 - 120	10/20/16 09:49	10/22/16 18:00	1
2,4,6-Tribromophenol (Surr)	73		35 - 125	10/20/16 09:49	10/22/16 18:00	1
Nitrobenzene-d5 (Surr)	69		36 - 120	10/20/16 09:49	10/22/16 18:00	1
Phenol-d5 (Surr)	21		10 - 120	10/20/16 09:49	10/22/16 18:00	1
Terphenyl-d14 (Surr)	65		17 - 120	10/20/16 09:49	10/22/16 18:00	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS) - RE

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.060	H	0.19	0.060	ug/L		10/25/16 08:51	10/26/16 19:54	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	54		42 - 120	10/25/16 08:51	10/26/16 19:54	1
2-Fluorophenol (Surr)	36		10 - 120	10/25/16 08:51	10/26/16 19:54	1
2,4,6-Tribromophenol (Surr)	63		35 - 125	10/25/16 08:51	10/26/16 19:54	1
Nitrobenzene-d5 (Surr)	66		36 - 120	10/25/16 08:51	10/26/16 19:54	1
Phenol-d5 (Surr)	21		10 - 120	10/25/16 08:51	10/26/16 19:54	1
Terphenyl-d14 (Surr)	66		17 - 120	10/25/16 08:51	10/26/16 19:54	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	0.36	J B	0.50	0.080	ug/L			10/26/16 18:37	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	82		76 - 121		10/26/16 18:37	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	1200		24	3.7	ug/L		10/18/16 15:30	10/24/16 14:50	1000

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	0	X D	18 - 125	10/18/16 15:30	10/24/16 14:50	1000
2,4-Dichlorophenylacetic acid	0	X D	18 - 125	10/18/16 15:30	10/24/16 14:50	1000

TestAmerica Canton

Client Sample Results

Client: GHD Services Inc.
 Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Client Sample ID: W-161013-PS-17

Lab Sample ID: 240-70899-2

Date Collected: 10/13/16 09:20

Matrix: Water

Date Received: 10/15/16 09:40

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.38	J	5.0	0.35	ug/L		10/17/16 14:00	10/19/16 00:39	1
Copper	0.61	J B	2.0	0.36	ug/L		10/17/16 14:00	10/19/16 00:39	1
Iron	<5.3		100	5.3	ug/L		10/17/16 14:00	10/19/16 00:39	1
Manganese	7.9		5.0	0.25	ug/L		10/17/16 14:00	10/19/16 00:39	1
Zinc	<6.2		20.0	6.2	ug/L		10/17/16 14:00	10/19/16 00:39	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	125		5.0	1.9	mg/L			10/20/16 14:42	1
Hardness as calcium carbonate	142		5.0	3.1	mg/L			10/19/16 09:22	1
Chloride	11.4		1.0	0.41	mg/L			10/15/16 14:56	1
Nitrate as N	1.7	H	0.10	0.035	mg/L			10/15/16 14:56	1
Sulfate	5.6		1.0	0.13	mg/L			10/15/16 14:56	1
Total Organic Carbon	12.3	^	2.0	0.16	mg/L			10/17/16 15:19	2

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Client Sample ID: W-161013-PS-18

Lab Sample ID: 240-70899-3

Date Collected: 10/13/16 10:15

Matrix: Water

Date Received: 10/15/16 09:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/25/16 15:44	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/25/16 15:44	1
Toluene	<0.23		1.0	0.23	ug/L			10/25/16 15:44	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/25/16 15:44	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	108		63 - 132		10/25/16 15:44	1
4-Bromofluorobenzene (Surr)	95		73 - 120		10/25/16 15:44	1
Toluene-d8 (Surr)	103		73 - 124		10/25/16 15:44	1
Dibromofluoromethane (Surr)	95		80 - 120		10/25/16 15:44	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.060	*	0.19	0.060	ug/L		10/20/16 09:49	10/22/16 16:20	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	66		42 - 120	10/20/16 09:49	10/22/16 16:20	1
2-Fluorophenol (Surr)	31		10 - 120	10/20/16 09:49	10/22/16 16:20	1
2,4,6-Tribromophenol (Surr)	52		35 - 125	10/20/16 09:49	10/22/16 16:20	1
Nitrobenzene-d5 (Surr)	64		36 - 120	10/20/16 09:49	10/22/16 16:20	1
Phenol-d5 (Surr)	17		10 - 120	10/20/16 09:49	10/22/16 16:20	1
Terphenyl-d14 (Surr)	56		17 - 120	10/20/16 09:49	10/22/16 16:20	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS) - RE

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.062	H	0.20	0.062	ug/L		10/25/16 08:51	10/26/16 18:22	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	69		42 - 120	10/25/16 08:51	10/26/16 18:22	1
2-Fluorophenol (Surr)	39		10 - 120	10/25/16 08:51	10/26/16 18:22	1
2,4,6-Tribromophenol (Surr)	25	X	35 - 125	10/25/16 08:51	10/26/16 18:22	1
Nitrobenzene-d5 (Surr)	66		36 - 120	10/25/16 08:51	10/26/16 18:22	1
Phenol-d5 (Surr)	24		10 - 120	10/25/16 08:51	10/26/16 18:22	1
Terphenyl-d14 (Surr)	71		17 - 120	10/25/16 08:51	10/26/16 18:22	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	0.11	J B	0.50	0.080	ug/L			10/26/16 18:54	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	83		76 - 121		10/26/16 18:54	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	3.7		0.095	0.015	ug/L		10/18/16 15:30	10/24/16 15:38	4

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	54		18 - 125	10/18/16 15:30	10/24/16 15:38	4
2,4-Dichlorophenylacetic acid	47		18 - 125	10/18/16 15:30	10/24/16 15:38	4

TestAmerica Canton

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Client Sample ID: W-161013-PS-18

Lab Sample ID: 240-70899-3

Date Collected: 10/13/16 10:15

Matrix: Water

Date Received: 10/15/16 09:40

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.35		5.0	0.35	ug/L		10/17/16 14:00	10/19/16 00:44	1
Copper	0.76	J B	2.0	0.36	ug/L		10/17/16 14:00	10/19/16 00:44	1
Iron	<5.3		100	5.3	ug/L		10/17/16 14:00	10/19/16 00:44	1
Manganese	<0.25		5.0	0.25	ug/L		10/17/16 14:00	10/19/16 00:44	1
Zinc	<6.2		20.0	6.2	ug/L		10/17/16 14:00	10/19/16 00:44	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	110		5.0	1.9	mg/L			10/20/16 14:51	1
Hardness as calcium carbonate	104		5.0	3.1	mg/L			10/19/16 09:27	1
Chloride	0.63	J	1.0	0.41	mg/L			10/15/16 18:17	1
Nitrate as N	0.46	H	0.10	0.035	mg/L			10/15/16 18:17	1
Sulfate	1.5		1.0	0.13	mg/L			10/15/16 18:17	1
Total Organic Carbon	0.29	J ^	1.0	0.080	mg/L			10/17/16 15:46	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Client Sample ID: W-161013-PS-19

Lab Sample ID: 240-70899-4

Date Collected: 10/13/16 11:00

Matrix: Water

Date Received: 10/15/16 09:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/25/16 16:06	1
Ethylbenzene	0.79	J	1.0	0.26	ug/L			10/25/16 16:06	1
Toluene	0.79	J	1.0	0.23	ug/L			10/25/16 16:06	1
Xylenes, Total	5.7		2.0	0.24	ug/L			10/25/16 16:06	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	107		63 - 132		10/25/16 16:06	1
4-Bromofluorobenzene (Surr)	98		73 - 120		10/25/16 16:06	1
Toluene-d8 (Surr)	96		73 - 124		10/25/16 16:06	1
Dibromofluoromethane (Surr)	97		80 - 120		10/25/16 16:06	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	6.2	*	0.76	0.24	ug/L		10/20/16 09:49	10/22/16 18:25	4

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	56		42 - 120	10/20/16 09:49	10/22/16 18:25	4
2-Fluorophenol (Surr)	31		10 - 120	10/20/16 09:49	10/22/16 18:25	4
2,4,6-Tribromophenol (Surr)	73		35 - 125	10/20/16 09:49	10/22/16 18:25	4
Nitrobenzene-d5 (Surr)	64		36 - 120	10/20/16 09:49	10/22/16 18:25	4
Phenol-d5 (Surr)	17		10 - 120	10/20/16 09:49	10/22/16 18:25	4
Terphenyl-d14 (Surr)	51		17 - 120	10/20/16 09:49	10/22/16 18:25	4

Method: 8270C - Semivolatile Organic Compounds (GC/MS) - RE

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	5.4	H	0.19	0.060	ug/L		10/25/16 08:51	10/26/16 20:17	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	29	X *	42 - 120	10/25/16 08:51	10/26/16 20:17	1
2-Fluorophenol (Surr)	38		10 - 120	10/25/16 08:51	10/26/16 20:17	1
2,4,6-Tribromophenol (Surr)	33	X *	35 - 125	10/25/16 08:51	10/26/16 20:17	1
Nitrobenzene-d5 (Surr)	59		36 - 120	10/25/16 08:51	10/26/16 20:17	1
Phenol-d5 (Surr)	22		10 - 120	10/25/16 08:51	10/26/16 20:17	1
Terphenyl-d14 (Surr)	62		17 - 120	10/25/16 08:51	10/26/16 20:17	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	5.5	B	0.50	0.080	ug/L			10/26/16 19:10	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	82		76 - 121		10/26/16 19:10	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	7300		240	37	ug/L		10/18/16 15:30	10/25/16 07:53	10000

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	0	X ^c D	18 - 125	10/18/16 15:30	10/25/16 07:53	10000
2,4-Dichlorophenylacetic acid	0	X D	18 - 125	10/18/16 15:30	10/25/16 07:53	10000

TestAmerica Canton

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Client Sample ID: W-161013-PS-19

Lab Sample ID: 240-70899-4

Date Collected: 10/13/16 11:00

Matrix: Water

Date Received: 10/15/16 09:40

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.46	J	5.0	0.35	ug/L		10/17/16 14:00	10/19/16 00:48	1
Copper	1.7	J B	2.0	0.36	ug/L		10/17/16 14:00	10/19/16 00:48	1
Iron	434	B	100	5.3	ug/L		10/17/16 14:00	10/19/16 00:48	1
Manganese	777		5.0	0.25	ug/L		10/17/16 14:00	10/19/16 00:48	1
Zinc	<6.2		20.0	6.2	ug/L		10/17/16 14:00	10/19/16 00:48	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	156		5.0	1.9	mg/L			10/20/16 15:04	1
Hardness as calcium carbonate	186		5.0	3.1	mg/L			10/19/16 09:33	1
Chloride	14.6		1.0	0.41	mg/L			10/15/16 18:37	1
Nitrate as N	<0.035	H	0.10	0.035	mg/L			10/15/16 18:37	1
Sulfate	24.3		1.0	0.13	mg/L			10/15/16 18:37	1
Total Organic Carbon	11.1	^	1.0	0.080	mg/L			10/17/16 16:12	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Client Sample ID: W-161013-PS-20

Lab Sample ID: 240-70899-5

Date Collected: 10/13/16 11:40

Matrix: Water

Date Received: 10/15/16 09:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/25/16 16:28	1
Ethylbenzene	0.30	J	1.0	0.26	ug/L			10/25/16 16:28	1
Toluene	<0.23		1.0	0.23	ug/L			10/25/16 16:28	1
Xylenes, Total	4.6		2.0	0.24	ug/L			10/25/16 16:28	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	119		63 - 132		10/25/16 16:28	1
4-Bromofluorobenzene (Surr)	104		73 - 120		10/25/16 16:28	1
Toluene-d8 (Surr)	99		73 - 124		10/25/16 16:28	1
Dibromofluoromethane (Surr)	109		80 - 120		10/25/16 16:28	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	9.6	*	0.79	0.25	ug/L		10/20/16 09:49	10/22/16 18:50	4

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	74		42 - 120	10/20/16 09:49	10/22/16 18:50	4
2-Fluorophenol (Surr)	29		10 - 120	10/20/16 09:49	10/22/16 18:50	4
2,4,6-Tribromophenol (Surr)	89		35 - 125	10/20/16 09:49	10/22/16 18:50	4
Nitrobenzene-d5 (Surr)	65		36 - 120	10/20/16 09:49	10/22/16 18:50	4
Phenol-d5 (Surr)	20		10 - 120	10/20/16 09:49	10/22/16 18:50	4
Terphenyl-d14 (Surr)	38		17 - 120	10/20/16 09:49	10/22/16 18:50	4

Method: 8270C - Semivolatile Organic Compounds (GC/MS) - RE

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	8.4	H	0.20	0.062	ug/L		10/25/16 08:51	10/26/16 20:40	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	58		42 - 120	10/25/16 08:51	10/26/16 20:40	1
2-Fluorophenol (Surr)	39		10 - 120	10/25/16 08:51	10/26/16 20:40	1
2,4,6-Tribromophenol (Surr)	70		35 - 125	10/25/16 08:51	10/26/16 20:40	1
Nitrobenzene-d5 (Surr)	63		36 - 120	10/25/16 08:51	10/26/16 20:40	1
Phenol-d5 (Surr)	24		10 - 120	10/25/16 08:51	10/26/16 20:40	1
Terphenyl-d14 (Surr)	56		17 - 120	10/25/16 08:51	10/26/16 20:40	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	0.12	J B	0.50	0.080	ug/L			10/26/16 19:28	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	82		76 - 121		10/26/16 19:28	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	6600		240	38	ug/L		10/18/16 15:30	10/25/16 08:18	10000

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	0	X ^c D	18 - 125	10/18/16 15:30	10/25/16 08:18	10000
2,4-Dichlorophenylacetic acid	0	X D	18 - 125	10/18/16 15:30	10/25/16 08:18	10000

TestAmerica Canton

Client Sample Results

Client: GHD Services Inc.
 Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Client Sample ID: W-161013-PS-20

Lab Sample ID: 240-70899-5

Date Collected: 10/13/16 11:40

Matrix: Water

Date Received: 10/15/16 09:40

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.44	J	5.0	0.35	ug/L		10/17/16 14:00	10/19/16 00:52	1
Copper	4.6	B	2.0	0.36	ug/L		10/17/16 14:00	10/19/16 00:52	1
Iron	124	B	100	5.3	ug/L		10/17/16 14:00	10/19/16 00:52	1
Manganese	399		5.0	0.25	ug/L		10/17/16 14:00	10/19/16 00:52	1
Zinc	<6.2		20.0	6.2	ug/L		10/17/16 14:00	10/19/16 00:52	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	83.7		5.0	1.9	mg/L			10/20/16 15:12	1
Hardness as calcium carbonate	100		5.0	3.1	mg/L			10/19/16 09:38	1
Chloride	6.1		1.0	0.41	mg/L			10/15/16 13:55	1
Nitrate as N	<0.035	H	0.10	0.035	mg/L			10/15/16 13:55	1
Sulfate	11.9		1.0	0.13	mg/L			10/15/16 13:55	1
Total Organic Carbon	12.3	^	1.0	0.080	mg/L			10/17/16 17:27	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Client Sample ID: W-161013-PS-21

Lab Sample ID: 240-70899-6

Date Collected: 10/13/16 12:45

Matrix: Water

Date Received: 10/15/16 09:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/25/16 16:50	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/25/16 16:50	1
Toluene	<0.23		1.0	0.23	ug/L			10/25/16 16:50	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/25/16 16:50	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	128		63 - 132		10/25/16 16:50	1
4-Bromofluorobenzene (Surr)	91		73 - 120		10/25/16 16:50	1
Toluene-d8 (Surr)	96		73 - 124		10/25/16 16:50	1
Dibromofluoromethane (Surr)	106		80 - 120		10/25/16 16:50	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.064	*	0.20	0.064	ug/L		10/20/16 09:49	10/22/16 16:45	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	69		42 - 120	10/20/16 09:49	10/22/16 16:45	1
2-Fluorophenol (Surr)	42		10 - 120	10/20/16 09:49	10/22/16 16:45	1
2,4,6-Tribromophenol (Surr)	52		35 - 125	10/20/16 09:49	10/22/16 16:45	1
Nitrobenzene-d5 (Surr)	64		36 - 120	10/20/16 09:49	10/22/16 16:45	1
Phenol-d5 (Surr)	24		10 - 120	10/20/16 09:49	10/22/16 16:45	1
Terphenyl-d14 (Surr)	72		17 - 120	10/20/16 09:49	10/22/16 16:45	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS) - RE

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.060	H	0.19	0.060	ug/L		10/25/16 08:51	10/26/16 18:45	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	69		42 - 120	10/25/16 08:51	10/26/16 18:45	1
2-Fluorophenol (Surr)	38		10 - 120	10/25/16 08:51	10/26/16 18:45	1
2,4,6-Tribromophenol (Surr)	25	X	35 - 125	10/25/16 08:51	10/26/16 18:45	1
Nitrobenzene-d5 (Surr)	63		36 - 120	10/25/16 08:51	10/26/16 18:45	1
Phenol-d5 (Surr)	23		10 - 120	10/25/16 08:51	10/26/16 18:45	1
Terphenyl-d14 (Surr)	84		17 - 120	10/25/16 08:51	10/26/16 18:45	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	0.15		0.097	0.015	ug/L		10/18/16 15:30	10/24/16 17:14	4

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	57		18 - 125	10/18/16 15:30	10/24/16 17:14	4
2,4-Dichlorophenylacetic acid	68		18 - 125	10/18/16 15:30	10/24/16 17:14	4

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.35		5.0	0.35	ug/L		10/17/16 14:00	10/19/16 00:57	1
Copper	0.57	J B	2.0	0.36	ug/L		10/17/16 14:00	10/19/16 00:57	1
Iron	15.6	J B	100	5.3	ug/L		10/17/16 14:00	10/19/16 00:57	1
Manganese	0.31	J	5.0	0.25	ug/L		10/17/16 14:00	10/19/16 00:57	1
Zinc	<6.2		20.0	6.2	ug/L		10/17/16 14:00	10/19/16 00:57	1

TestAmerica Canton

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Client Sample ID: W-161013-PS-22

Lab Sample ID: 240-70899-7

Date Collected: 10/13/16 13:10

Matrix: Water

Date Received: 10/15/16 09:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/25/16 17:11	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/25/16 17:11	1
Toluene	<0.23		1.0	0.23	ug/L			10/25/16 17:11	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/25/16 17:11	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	111		63 - 132		10/25/16 17:11	1
4-Bromofluorobenzene (Surr)	91		73 - 120		10/25/16 17:11	1
Toluene-d8 (Surr)	100		73 - 124		10/25/16 17:11	1
Dibromofluoromethane (Surr)	100		80 - 120		10/25/16 17:11	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.061	*	0.19	0.061	ug/L		10/20/16 09:49	10/22/16 17:10	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	69		42 - 120	10/20/16 09:49	10/22/16 17:10	1
2-Fluorophenol (Surr)	35		10 - 120	10/20/16 09:49	10/22/16 17:10	1
2,4,6-Tribromophenol (Surr)	63		35 - 125	10/20/16 09:49	10/22/16 17:10	1
Nitrobenzene-d5 (Surr)	65		36 - 120	10/20/16 09:49	10/22/16 17:10	1
Phenol-d5 (Surr)	19		10 - 120	10/20/16 09:49	10/22/16 17:10	1
Terphenyl-d14 (Surr)	45		17 - 120	10/20/16 09:49	10/22/16 17:10	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS) - RE

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.061	H	0.20	0.061	ug/L		10/25/16 08:51	10/26/16 19:08	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	70		42 - 120	10/25/16 08:51	10/26/16 19:08	1
2-Fluorophenol (Surr)	44		10 - 120	10/25/16 08:51	10/26/16 19:08	1
2,4,6-Tribromophenol (Surr)	57		35 - 125	10/25/16 08:51	10/26/16 19:08	1
Nitrobenzene-d5 (Surr)	66		36 - 120	10/25/16 08:51	10/26/16 19:08	1
Phenol-d5 (Surr)	28		10 - 120	10/25/16 08:51	10/26/16 19:08	1
Terphenyl-d14 (Surr)	60		17 - 120	10/25/16 08:51	10/26/16 19:08	1

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	<0.080		0.50	0.080	ug/L			10/26/16 19:44	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	79		76 - 121		10/26/16 19:44	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	0.20		0.095	0.015	ug/L		10/18/16 15:30	10/24/16 18:27	4

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	66		18 - 125	10/18/16 15:30	10/24/16 18:27	4
2,4-Dichlorophenylacetic acid	70		18 - 125	10/18/16 15:30	10/24/16 18:27	4

TestAmerica Canton

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Client Sample ID: W-161013-PS-22

Lab Sample ID: 240-70899-7

Date Collected: 10/13/16 13:10

Matrix: Water

Date Received: 10/15/16 09:40

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.71	J	5.0	0.35	ug/L		10/17/16 14:00	10/19/16 01:01	1
Copper	19.7	B	2.0	0.36	ug/L		10/17/16 14:00	10/19/16 01:01	1
Iron	2290	B	100	5.3	ug/L		10/17/16 14:00	10/19/16 01:01	1
Manganese	52.7		5.0	0.25	ug/L		10/17/16 14:00	10/19/16 01:01	1
Zinc	11.7	J	20.0	6.2	ug/L		10/17/16 14:00	10/19/16 01:01	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	126		5.0	1.9	mg/L			10/20/16 15:20	1
Hardness as calcium carbonate	152		5.0	3.1	mg/L			10/19/16 09:43	1
Chloride	14.5		1.0	0.41	mg/L			10/15/16 14:15	1
Nitrate as N	6.9	H	0.10	0.035	mg/L			10/15/16 14:15	1
Sulfate	8.1		1.0	0.13	mg/L			10/15/16 14:15	1
Total Organic Carbon	4.2	^	1.0	0.080	mg/L			10/17/16 17:56	1

Client Sample Results

Client: GHD Services Inc.
 Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Client Sample ID: TRIP BLANK 003

Lab Sample ID: 240-70899-8

Date Collected: 10/13/16 14:00

Matrix: Water

Date Received: 10/15/16 09:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/25/16 17:33	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/25/16 17:33	1
Toluene	<0.23		1.0	0.23	ug/L			10/25/16 17:33	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/25/16 17:33	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	114		63 - 132		10/25/16 17:33	1
4-Bromofluorobenzene (Surr)	98		73 - 120		10/25/16 17:33	1
Toluene-d8 (Surr)	107		73 - 124		10/25/16 17:33	1
Dibromofluoromethane (Surr)	97		80 - 120		10/25/16 17:33	1



Surrogate Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		12DCE (63-132)	BFB (73-120)	TOL (73-124)	DBFM (80-120)
240-70899-1	W-161013-PS-16	124	101	96	105
240-70899-2	W-161013-PS-17	111	101	97	100
240-70899-3	W-161013-PS-18	108	95	103	95
240-70899-4	W-161013-PS-19	107	98	96	97
240-70899-5	W-161013-PS-20	119	104	99	109
240-70899-6	W-161013-PS-21	128	91	96	106
240-70899-7	W-161013-PS-22	111	91	100	100
240-70899-8	TRIP BLANK 003	114	98	107	97
LCS 240-252909/4	Lab Control Sample	114	105	95	102
MB 240-252909/6	Method Blank	100	89	99	82

Surrogate Legend

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

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)					
		FBP (42-120)	2FP (10-120)	TBP (35-125)	NBZ (36-120)	PHL (10-120)	TPH (17-120)
240-70899-1	W-161013-PS-16	57	33	69	63	19	54
240-70899-1 - RE	W-161013-PS-16	58	29	69	61	17	66
240-70899-2	W-161013-PS-17	61	36	73	69	21	65
240-70899-2 - RE	W-161013-PS-17	54	36	63	66	21	66
240-70899-3	W-161013-PS-18	66	31	52	64	17	56
240-70899-3 - RE	W-161013-PS-18	69	39	25 X	66	24	71
240-70899-4	W-161013-PS-19	56	31	73	64	17	51
240-70899-4 - RE	W-161013-PS-19	29 X *	38	33 X *	59	22	62
240-70899-5	W-161013-PS-20	74	29	89	65	20	38
240-70899-5 - RE	W-161013-PS-20	58	39	70	63	24	56
240-70899-6	W-161013-PS-21	69	42	52	64	24	72
240-70899-6 - RE	W-161013-PS-21	69	38	25 X	63	23	84
240-70899-7	W-161013-PS-22	69	35	63	65	19	45
240-70899-7 - RE	W-161013-PS-22	70	44	57	66	28	60
LCS 240-252314/22-A	Lab Control Sample	56	56	67	70	45	79
LCS 240-252867/22-A	Lab Control Sample	82	63	68	78	48	94
MB 240-252314/21-A	Method Blank	52	57	58	66	47	82
MB 240-252867/21-A	Method Blank	77	64	35	71	47	89

Surrogate Legend

FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14 (Surr)

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Surrogate Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Method: RSK-175 - Dissolved Gases (GC)

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	Trifluoroet (76-121)
240-70899-1	W-161013-PS-16	82
240-70899-2	W-161013-PS-17	82
240-70899-3	W-161013-PS-18	83
240-70899-4	W-161013-PS-19	82
240-70899-5	W-161013-PS-20	82
240-70899-7	W-161013-PS-22	79
LCS 240-253107/5	Lab Control Sample	87
MB 240-253107/4	Method Blank	90

Surrogate Legend

1,1,1-Trifluoroethane = 1,1,1-Trifluoroethane

Method: 8151A - Herbicides (GC)

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	DCPA1 (18-125)	DCPA2 (18-125)
240-70899-1	W-161013-PS-16	0 X ^c D	0 X D
240-70899-2	W-161013-PS-17	0 X D	0 X D
240-70899-3	W-161013-PS-18	54	47
240-70899-4	W-161013-PS-19	0 X ^c D	0 X D
240-70899-5	W-161013-PS-20	0 X ^c D	0 X D
240-70899-6	W-161013-PS-21	57	68
240-70899-7	W-161013-PS-22	66	70
LCS 180-191589/2-A	Lab Control Sample	34	38
LCSD 180-191589/3-A	Lab Control Sample Dup	43	49
MB 180-191589/1-A	Method Blank	34	39

Surrogate Legend

DCPA = 2,4-Dichlorophenylacetic acid

QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-252909/6

Matrix: Water

Analysis Batch: 252909

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/25/16 13:49	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/25/16 13:49	1
Toluene	<0.23		1.0	0.23	ug/L			10/25/16 13:49	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/25/16 13:49	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	100		63 - 132		10/25/16 13:49	1
4-Bromofluorobenzene (Surr)	89		73 - 120		10/25/16 13:49	1
Toluene-d8 (Surr)	99		73 - 124		10/25/16 13:49	1
Dibromofluoromethane (Surr)	82		80 - 120		10/25/16 13:49	1

Lab Sample ID: LCS 240-252909/4

Matrix: Water

Analysis Batch: 252909

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	10.0	9.97		ug/L		100	80 - 120
Ethylbenzene	10.0	10.1		ug/L		101	80 - 120
Toluene	10.0	9.54		ug/L		95	80 - 121
Xylenes, Total	20.0	19.5		ug/L		98	80 - 120
m-Xylene & p-Xylene	10.0	9.84		ug/L		98	80 - 120
o-Xylene	10.0	9.68		ug/L		97	80 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	114		63 - 132
4-Bromofluorobenzene (Surr)	105		73 - 120
Toluene-d8 (Surr)	95		73 - 124
Dibromofluoromethane (Surr)	102		80 - 120

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-252314/21-A

Matrix: Water

Analysis Batch: 252599

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 252314

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.063		0.20	0.063	ug/L		10/20/16 09:49	10/22/16 10:05	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	52		42 - 120	10/20/16 09:49	10/22/16 10:05	1
2-Fluorophenol (Surr)	57		10 - 120	10/20/16 09:49	10/22/16 10:05	1
2,4,6-Tribromophenol (Surr)	58		35 - 125	10/20/16 09:49	10/22/16 10:05	1
Nitrobenzene-d5 (Surr)	66		36 - 120	10/20/16 09:49	10/22/16 10:05	1
Phenol-d5 (Surr)	47		10 - 120	10/20/16 09:49	10/22/16 10:05	1
Terphenyl-d14 (Surr)	82		17 - 120	10/20/16 09:49	10/22/16 10:05	1

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QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-252314/22-A
Matrix: Water
Analysis Batch: 252599

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 252314

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Naphthalene	20.0	10.5	*	ug/L		53	54 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2-Fluorobiphenyl (Surr)	56		42 - 120
2-Fluorophenol (Surr)	56		10 - 120
2,4,6-Tribromophenol (Surr)	67		35 - 125
Nitrobenzene-d5 (Surr)	70		36 - 120
Phenol-d5 (Surr)	45		10 - 120
Terphenyl-d14 (Surr)	79		17 - 120

Lab Sample ID: MB 240-252867/21-A
Matrix: Water
Analysis Batch: 253053

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 252867

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.063		0.20	0.063	ug/L		10/25/16 08:51	10/26/16 11:28	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	77		42 - 120	10/25/16 08:51	10/26/16 11:28	1
2-Fluorophenol (Surr)	64		10 - 120	10/25/16 08:51	10/26/16 11:28	1
2,4,6-Tribromophenol (Surr)	35		35 - 125	10/25/16 08:51	10/26/16 11:28	1
Nitrobenzene-d5 (Surr)	71		36 - 120	10/25/16 08:51	10/26/16 11:28	1
Phenol-d5 (Surr)	47		10 - 120	10/25/16 08:51	10/26/16 11:28	1
Terphenyl-d14 (Surr)	89		17 - 120	10/25/16 08:51	10/26/16 11:28	1

Lab Sample ID: LCS 240-252867/22-A
Matrix: Water
Analysis Batch: 253053

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 252867

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Naphthalene	20.0	15.2		ug/L		76	54 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2-Fluorobiphenyl (Surr)	82		42 - 120
2-Fluorophenol (Surr)	63		10 - 120
2,4,6-Tribromophenol (Surr)	68		35 - 125
Nitrobenzene-d5 (Surr)	78		36 - 120
Phenol-d5 (Surr)	48		10 - 120
Terphenyl-d14 (Surr)	94		17 - 120

QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 240-253107/4
Matrix: Water
Analysis Batch: 253107

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Methane	0.0844	J	0.50	0.080	ug/L			10/26/16 15:30	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	90		76 - 121					10/26/16 15:30	1

Lab Sample ID: LCS 240-253107/5
Matrix: Water
Analysis Batch: 253107

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Methane	199	204		ug/L		103	80 - 130
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
1,1,1-Trifluoroethane	87		76 - 121				

Method: 8151A - Herbicides (GC)

Lab Sample ID: MB 180-191589/1-A
Matrix: Water
Analysis Batch: 191929

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 191589

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.016		0.10	0.016	ug/L		10/18/16 15:30	10/21/16 22:01	4
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	34		18 - 125				10/18/16 15:30	10/21/16 22:01	4
2,4-Dichlorophenylacetic acid	39		18 - 125				10/18/16 15:30	10/21/16 22:01	4

Lab Sample ID: LCS 180-191589/2-A
Matrix: Water
Analysis Batch: 191929

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 191589

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Pentachlorophenol	5.00	5.13		ug/L		103	30 - 150
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
2,4-Dichlorophenylacetic acid	34		18 - 125				
2,4-Dichlorophenylacetic acid	38		18 - 125				

Lab Sample ID: LCSD 180-191589/3-A
Matrix: Water
Analysis Batch: 192136

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 191589

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Pentachlorophenol	5.00	5.28		ug/L		106	30 - 150	3	35

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QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Method: 8151A - Herbicides (GC) (Continued)

Lab Sample ID: LCSD 180-191589/3-A
Matrix: Water
Analysis Batch: 192136

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 191589

Surrogate	LCS D %Recovery	LCS D Qualifier	Limits
2,4-Dichlorophenylacetic acid	43		18 - 125
2,4-Dichlorophenylacetic acid	49		18 - 125

Method: 6020 - Metals (ICP/MS)

Lab Sample ID: MB 240-251725/1-A
Matrix: Water
Analysis Batch: 252056

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 251725

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.35		5.0	0.35	ug/L		10/17/16 14:00	10/18/16 23:22	1
Copper	0.563	J	2.0	0.36	ug/L		10/17/16 14:00	10/18/16 23:22	1
Iron	11.64	J	100	5.3	ug/L		10/17/16 14:00	10/18/16 23:22	1
Manganese	<0.25		5.0	0.25	ug/L		10/17/16 14:00	10/18/16 23:22	1
Zinc	<6.2		20.0	6.2	ug/L		10/17/16 14:00	10/18/16 23:22	1

Lab Sample ID: LCS 240-251725/3-A
Matrix: Water
Analysis Batch: 252056

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 251725

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Arsenic	1000	965.3		ug/L		97	80 - 120
Copper	1000	1041		ug/L		104	80 - 120
Iron	10000	10080		ug/L		101	80 - 120
Manganese	1000	1007		ug/L		101	80 - 120
Zinc	1000	1068		ug/L		107	80 - 120

Method: 2320B-1997 - Alkalinity, Total

Lab Sample ID: MB 240-252510/5
Matrix: Water
Analysis Batch: 252510

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	<1.9		5.0	1.9	mg/L			10/20/16 11:08	1

Lab Sample ID: LCS 240-252510/4
Matrix: Water
Analysis Batch: 252510

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Alkalinity	368	368.6		mg/L		100	86 - 123

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QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Method: 2340C-1997 - Hardness, Total

Lab Sample ID: MB 240-252065/1
Matrix: Water
Analysis Batch: 252065

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	<3.1		5.0	3.1	mg/L			10/19/16 07:51	1

Lab Sample ID: LCS 240-252065/2
Matrix: Water
Analysis Batch: 252065

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Hardness as calcium carbonate	170	162.0		mg/L		95	80 - 120

Lab Sample ID: 240-70899-1 DU
Matrix: Water
Analysis Batch: 252065

Client Sample ID: W-161013-PS-16
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Hardness as calcium carbonate	148		150.0		mg/L		1	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 240-251678/3
Matrix: Water
Analysis Batch: 251678

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.41		1.0	0.41	mg/L			10/15/16 13:15	1
Sulfate	<0.13		1.0	0.13	mg/L			10/15/16 13:15	1

Lab Sample ID: LCS 240-251678/4
Matrix: Water
Analysis Batch: 251678

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.66		mg/L		101	90 - 110
Sulfate	50.0	51.94		mg/L		104	90 - 110

Lab Sample ID: 240-70899-2 MS
Matrix: Water
Analysis Batch: 251678

Client Sample ID: W-161013-PS-17
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	11.4		50.0	61.39		mg/L		100	80 - 120
Sulfate	5.6		50.0	58.16		mg/L		105	80 - 120

Lab Sample ID: 240-70899-2 MSD
Matrix: Water
Analysis Batch: 251678

Client Sample ID: W-161013-PS-17
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	11.4		50.0	62.77		mg/L		103	80 - 120	2	15
Sulfate	5.6		50.0	59.81		mg/L		108	80 - 120	3	15

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QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: MB 240-251679/3
Matrix: Water
Analysis Batch: 251679

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	<0.035		0.10	0.035	mg/L			10/15/16 13:15	1

Lab Sample ID: LCS 240-251679/4
Matrix: Water
Analysis Batch: 251679

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	2.50	2.57		mg/L		103	90 - 110

Lab Sample ID: 240-70899-2 MS
Matrix: Water
Analysis Batch: 251679

Client Sample ID: W-161013-PS-17
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	1.7	H	2.50	4.57		mg/L		113	80 - 120

Lab Sample ID: 240-70899-2 MSD
Matrix: Water
Analysis Batch: 251679

Client Sample ID: W-161013-PS-17
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate as N	1.7	H	2.50	4.63		mg/L		115	80 - 120	1	15

Method: 9060 - Organic Carbon, Total (TOC)

Lab Sample ID: MB 240-251836/4
Matrix: Water
Analysis Batch: 251836

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	<0.080		1.0	0.080	mg/L			10/17/16 11:07	1

Lab Sample ID: LCS 240-251836/6
Matrix: Water
Analysis Batch: 251836

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	46.3	46.28		mg/L		100	80 - 120

Lab Sample ID: LLCS 240-251836/5
Matrix: Water
Analysis Batch: 251836

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

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	4.63	4.38		mg/L		95	88 - 115

TestAmerica Canton

QC Association Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

GC/MS VOA

Analysis Batch: 252909

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70899-1	W-161013-PS-16	Total/NA	Water	8260B	
240-70899-2	W-161013-PS-17	Total/NA	Water	8260B	
240-70899-3	W-161013-PS-18	Total/NA	Water	8260B	
240-70899-4	W-161013-PS-19	Total/NA	Water	8260B	
240-70899-5	W-161013-PS-20	Total/NA	Water	8260B	
240-70899-6	W-161013-PS-21	Total/NA	Water	8260B	
240-70899-7	W-161013-PS-22	Total/NA	Water	8260B	
240-70899-8	TRIP BLANK 003	Total/NA	Water	8260B	
MB 240-252909/6	Method Blank	Total/NA	Water	8260B	
LCS 240-252909/4	Lab Control Sample	Total/NA	Water	8260B	

GC/MS Semi VOA

Prep Batch: 252314

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70899-1	W-161013-PS-16	Total/NA	Water	3510C	
240-70899-2	W-161013-PS-17	Total/NA	Water	3510C	
240-70899-3	W-161013-PS-18	Total/NA	Water	3510C	
240-70899-4	W-161013-PS-19	Total/NA	Water	3510C	
240-70899-5	W-161013-PS-20	Total/NA	Water	3510C	
240-70899-6	W-161013-PS-21	Total/NA	Water	3510C	
240-70899-7	W-161013-PS-22	Total/NA	Water	3510C	
MB 240-252314/21-A	Method Blank	Total/NA	Water	3510C	
LCS 240-252314/22-A	Lab Control Sample	Total/NA	Water	3510C	

Analysis Batch: 252599

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70899-1	W-161013-PS-16	Total/NA	Water	8270C	252314
240-70899-2	W-161013-PS-17	Total/NA	Water	8270C	252314
240-70899-3	W-161013-PS-18	Total/NA	Water	8270C	252314
240-70899-4	W-161013-PS-19	Total/NA	Water	8270C	252314
240-70899-5	W-161013-PS-20	Total/NA	Water	8270C	252314
240-70899-6	W-161013-PS-21	Total/NA	Water	8270C	252314
240-70899-7	W-161013-PS-22	Total/NA	Water	8270C	252314
MB 240-252314/21-A	Method Blank	Total/NA	Water	8270C	252314
LCS 240-252314/22-A	Lab Control Sample	Total/NA	Water	8270C	252314

Prep Batch: 252867

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70899-1 - RE	W-161013-PS-16	Total/NA	Water	3510C	
240-70899-2 - RE	W-161013-PS-17	Total/NA	Water	3510C	
240-70899-3 - RE	W-161013-PS-18	Total/NA	Water	3510C	
240-70899-4 - RE	W-161013-PS-19	Total/NA	Water	3510C	
240-70899-5 - RE	W-161013-PS-20	Total/NA	Water	3510C	
240-70899-6 - RE	W-161013-PS-21	Total/NA	Water	3510C	
240-70899-7 - RE	W-161013-PS-22	Total/NA	Water	3510C	
MB 240-252867/21-A	Method Blank	Total/NA	Water	3510C	
LCS 240-252867/22-A	Lab Control Sample	Total/NA	Water	3510C	

TestAmerica Canton

QC Association Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

GC/MS Semi VOA (Continued)

Analysis Batch: 253053

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70899-1 - RE	W-161013-PS-16	Total/NA	Water	8270C	252867
240-70899-2 - RE	W-161013-PS-17	Total/NA	Water	8270C	252867
240-70899-3 - RE	W-161013-PS-18	Total/NA	Water	8270C	252867
240-70899-4 - RE	W-161013-PS-19	Total/NA	Water	8270C	252867
240-70899-5 - RE	W-161013-PS-20	Total/NA	Water	8270C	252867
240-70899-6 - RE	W-161013-PS-21	Total/NA	Water	8270C	252867
240-70899-7 - RE	W-161013-PS-22	Total/NA	Water	8270C	252867
MB 240-252867/21-A	Method Blank	Total/NA	Water	8270C	252867
LCS 240-252867/22-A	Lab Control Sample	Total/NA	Water	8270C	252867

GC VOA

Analysis Batch: 253107

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70899-1	W-161013-PS-16	Total/NA	Water	RSK-175	
240-70899-2	W-161013-PS-17	Total/NA	Water	RSK-175	
240-70899-3	W-161013-PS-18	Total/NA	Water	RSK-175	
240-70899-4	W-161013-PS-19	Total/NA	Water	RSK-175	
240-70899-5	W-161013-PS-20	Total/NA	Water	RSK-175	
240-70899-7	W-161013-PS-22	Total/NA	Water	RSK-175	
MB 240-253107/4	Method Blank	Total/NA	Water	RSK-175	
LCS 240-253107/5	Lab Control Sample	Total/NA	Water	RSK-175	

GC Semi VOA

Prep Batch: 191589

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70899-1	W-161013-PS-16	Total/NA	Water	8151A	
240-70899-2	W-161013-PS-17	Total/NA	Water	8151A	
240-70899-3	W-161013-PS-18	Total/NA	Water	8151A	
240-70899-4	W-161013-PS-19	Total/NA	Water	8151A	
240-70899-5	W-161013-PS-20	Total/NA	Water	8151A	
240-70899-6	W-161013-PS-21	Total/NA	Water	8151A	
240-70899-7	W-161013-PS-22	Total/NA	Water	8151A	
MB 180-191589/1-A	Method Blank	Total/NA	Water	8151A	
LCS 180-191589/2-A	Lab Control Sample	Total/NA	Water	8151A	
LCS 180-191589/3-A	Lab Control Sample Dup	Total/NA	Water	8151A	

Analysis Batch: 191929

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 180-191589/1-A	Method Blank	Total/NA	Water	8151A	191589
LCS 180-191589/2-A	Lab Control Sample	Total/NA	Water	8151A	191589

Analysis Batch: 192136

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70899-1	W-161013-PS-16	Total/NA	Water	8151A	191589
240-70899-2	W-161013-PS-17	Total/NA	Water	8151A	191589
240-70899-3	W-161013-PS-18	Total/NA	Water	8151A	191589
240-70899-4	W-161013-PS-19	Total/NA	Water	8151A	191589
240-70899-5	W-161013-PS-20	Total/NA	Water	8151A	191589

TestAmerica Canton

QC Association Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

GC Semi VOA (Continued)

Analysis Batch: 192136 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70899-6	W-161013-PS-21	Total/NA	Water	8151A	191589
240-70899-7	W-161013-PS-22	Total/NA	Water	8151A	191589
LCS D 180-191589/3-A	Lab Control Sample Dup	Total/NA	Water	8151A	191589

Metals

Prep Batch: 251725

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70899-1	W-161013-PS-16	Dissolved	Water	3005A	
240-70899-2	W-161013-PS-17	Dissolved	Water	3005A	
240-70899-3	W-161013-PS-18	Dissolved	Water	3005A	
240-70899-4	W-161013-PS-19	Dissolved	Water	3005A	
240-70899-5	W-161013-PS-20	Dissolved	Water	3005A	
240-70899-6	W-161013-PS-21	Dissolved	Water	3005A	
240-70899-7	W-161013-PS-22	Dissolved	Water	3005A	
MB 240-251725/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-251725/3-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 252056

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70899-1	W-161013-PS-16	Dissolved	Water	6020	251725
240-70899-2	W-161013-PS-17	Dissolved	Water	6020	251725
240-70899-3	W-161013-PS-18	Dissolved	Water	6020	251725
240-70899-4	W-161013-PS-19	Dissolved	Water	6020	251725
240-70899-5	W-161013-PS-20	Dissolved	Water	6020	251725
240-70899-6	W-161013-PS-21	Dissolved	Water	6020	251725
240-70899-7	W-161013-PS-22	Dissolved	Water	6020	251725
MB 240-251725/1-A	Method Blank	Total Recoverable	Water	6020	251725
LCS 240-251725/3-A	Lab Control Sample	Total Recoverable	Water	6020	251725

General Chemistry

Analysis Batch: 251678

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70899-1	W-161013-PS-16	Total/NA	Water	300.0	
240-70899-2	W-161013-PS-17	Total/NA	Water	300.0	
240-70899-3	W-161013-PS-18	Total/NA	Water	300.0	
240-70899-4	W-161013-PS-19	Total/NA	Water	300.0	
240-70899-5	W-161013-PS-20	Total/NA	Water	300.0	
240-70899-7	W-161013-PS-22	Total/NA	Water	300.0	
MB 240-251678/3	Method Blank	Total/NA	Water	300.0	
LCS 240-251678/4	Lab Control Sample	Total/NA	Water	300.0	
240-70899-2 MS	W-161013-PS-17	Total/NA	Water	300.0	
240-70899-2 MSD	W-161013-PS-17	Total/NA	Water	300.0	

Analysis Batch: 251679

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70899-1	W-161013-PS-16	Total/NA	Water	300.0	
240-70899-2	W-161013-PS-17	Total/NA	Water	300.0	
240-70899-3	W-161013-PS-18	Total/NA	Water	300.0	

TestAmerica Canton

QC Association Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

General Chemistry (Continued)

Analysis Batch: 251679 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70899-4	W-161013-PS-19	Total/NA	Water	300.0	
240-70899-5	W-161013-PS-20	Total/NA	Water	300.0	
240-70899-7	W-161013-PS-22	Total/NA	Water	300.0	
MB 240-251679/3	Method Blank	Total/NA	Water	300.0	
LCS 240-251679/4	Lab Control Sample	Total/NA	Water	300.0	
240-70899-2 MS	W-161013-PS-17	Total/NA	Water	300.0	
240-70899-2 MSD	W-161013-PS-17	Total/NA	Water	300.0	

Analysis Batch: 251836

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70899-1	W-161013-PS-16	Total/NA	Water	9060	
240-70899-2	W-161013-PS-17	Total/NA	Water	9060	
240-70899-3	W-161013-PS-18	Total/NA	Water	9060	
240-70899-4	W-161013-PS-19	Total/NA	Water	9060	
240-70899-5	W-161013-PS-20	Total/NA	Water	9060	
240-70899-7	W-161013-PS-22	Total/NA	Water	9060	
MB 240-251836/4	Method Blank	Total/NA	Water	9060	
LCS 240-251836/6	Lab Control Sample	Total/NA	Water	9060	
LLCS 240-251836/5	Lab Control Sample	Total/NA	Water	9060	

Analysis Batch: 252065

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70899-1	W-161013-PS-16	Total/NA	Water	2340C-1997	
240-70899-2	W-161013-PS-17	Total/NA	Water	2340C-1997	
240-70899-3	W-161013-PS-18	Total/NA	Water	2340C-1997	
240-70899-4	W-161013-PS-19	Total/NA	Water	2340C-1997	
240-70899-5	W-161013-PS-20	Total/NA	Water	2340C-1997	
240-70899-7	W-161013-PS-22	Total/NA	Water	2340C-1997	
MB 240-252065/1	Method Blank	Total/NA	Water	2340C-1997	
LCS 240-252065/2	Lab Control Sample	Total/NA	Water	2340C-1997	
240-70899-1 DU	W-161013-PS-16	Total/NA	Water	2340C-1997	

Analysis Batch: 252510

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70899-1	W-161013-PS-16	Total/NA	Water	2320B-1997	
240-70899-2	W-161013-PS-17	Total/NA	Water	2320B-1997	
240-70899-3	W-161013-PS-18	Total/NA	Water	2320B-1997	
240-70899-4	W-161013-PS-19	Total/NA	Water	2320B-1997	
240-70899-5	W-161013-PS-20	Total/NA	Water	2320B-1997	
240-70899-7	W-161013-PS-22	Total/NA	Water	2320B-1997	
MB 240-252510/5	Method Blank	Total/NA	Water	2320B-1997	
LCS 240-252510/4	Lab Control Sample	Total/NA	Water	2320B-1997	

Lab Chronicle

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Client Sample ID: W-161013-PS-16

Lab Sample ID: 240-70899-1

Date Collected: 10/13/16 09:10

Matrix: Water

Date Received: 10/15/16 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	252909	10/25/16 15:00	LRW	TAL CAN
Total/NA	Prep	3510C	RE		252867	10/25/16 08:51	CS	TAL CAN
Total/NA	Analysis	8270C	RE	1	253053	10/26/16 19:31	JMG	TAL CAN
Total/NA	Prep	3510C			252314	10/20/16 09:49	JDR	TAL CAN
Total/NA	Analysis	8270C		1	252599	10/22/16 17:35	MRU	TAL CAN
Total/NA	Analysis	RSK-175		1	253107	10/26/16 18:03	BPM	TAL CAN
Total/NA	Prep	8151A			191589	10/18/16 15:30	CBY	TAL PIT
Total/NA	Analysis	8151A		10000	192136	10/25/16 07:29	JMO	TAL PIT
Dissolved	Prep	3005A			251725	10/17/16 14:00	AJC	TAL CAN
Dissolved	Analysis	6020		1	252056	10/19/16 00:35	DSH	TAL CAN
Total/NA	Analysis	2320B-1997		1	252510	10/20/16 14:33	JMB	TAL CAN
Total/NA	Analysis	2340C-1997		1	252065	10/19/16 09:17	TPH	TAL CAN
Total/NA	Analysis	300.0		1	251678	10/15/16 14:35	LKG	TAL CAN
Total/NA	Analysis	300.0		1	251679	10/15/16 14:35	LKG	TAL CAN
Total/NA	Analysis	9060		2	251836	10/17/16 14:52	TPH	TAL CAN

Client Sample ID: W-161013-PS-17

Lab Sample ID: 240-70899-2

Date Collected: 10/13/16 09:20

Matrix: Water

Date Received: 10/15/16 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	252909	10/25/16 15:22	LRW	TAL CAN
Total/NA	Prep	3510C	RE		252867	10/25/16 08:51	CS	TAL CAN
Total/NA	Analysis	8270C	RE	1	253053	10/26/16 19:54	JMG	TAL CAN
Total/NA	Prep	3510C			252314	10/20/16 09:49	JDR	TAL CAN
Total/NA	Analysis	8270C		1	252599	10/22/16 18:00	MRU	TAL CAN
Total/NA	Analysis	RSK-175		1	253107	10/26/16 18:37	BPM	TAL CAN
Total/NA	Prep	8151A			191589	10/18/16 15:30	CBY	TAL PIT
Total/NA	Analysis	8151A		1000	192136	10/24/16 14:50	JMO	TAL PIT
Dissolved	Prep	3005A			251725	10/17/16 14:00	AJC	TAL CAN
Dissolved	Analysis	6020		1	252056	10/19/16 00:39	DSH	TAL CAN
Total/NA	Analysis	2320B-1997		1	252510	10/20/16 14:42	JMB	TAL CAN
Total/NA	Analysis	2340C-1997		1	252065	10/19/16 09:22	TPH	TAL CAN
Total/NA	Analysis	300.0		1	251678	10/15/16 14:56	LKG	TAL CAN
Total/NA	Analysis	300.0		1	251679	10/15/16 14:56	LKG	TAL CAN
Total/NA	Analysis	9060		2	251836	10/17/16 15:19	TPH	TAL CAN

TestAmerica Canton

Lab Chronicle

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Client Sample ID: W-161013-PS-18

Lab Sample ID: 240-70899-3

Date Collected: 10/13/16 10:15

Matrix: Water

Date Received: 10/15/16 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	252909	10/25/16 15:44	LRW	TAL CAN
Total/NA	Prep	3510C	RE		252867	10/25/16 08:51	CS	TAL CAN
Total/NA	Analysis	8270C	RE	1	253053	10/26/16 18:22	JMG	TAL CAN
Total/NA	Prep	3510C			252314	10/20/16 09:49	JDR	TAL CAN
Total/NA	Analysis	8270C		1	252599	10/22/16 16:20	MRU	TAL CAN
Total/NA	Analysis	RSK-175		1	253107	10/26/16 18:54	BPM	TAL CAN
Total/NA	Prep	8151A			191589	10/18/16 15:30	CBY	TAL PIT
Total/NA	Analysis	8151A		4	192136	10/24/16 15:38	JMO	TAL PIT
Dissolved	Prep	3005A			251725	10/17/16 14:00	AJC	TAL CAN
Dissolved	Analysis	6020		1	252056	10/19/16 00:44	DSH	TAL CAN
Total/NA	Analysis	2320B-1997		1	252510	10/20/16 14:51	JMB	TAL CAN
Total/NA	Analysis	2340C-1997		1	252065	10/19/16 09:27	TPH	TAL CAN
Total/NA	Analysis	300.0		1	251678	10/15/16 18:17	LKG	TAL CAN
Total/NA	Analysis	300.0		1	251679	10/15/16 18:17	LKG	TAL CAN
Total/NA	Analysis	9060		1	251836	10/17/16 15:46	TPH	TAL CAN

Client Sample ID: W-161013-PS-19

Lab Sample ID: 240-70899-4

Date Collected: 10/13/16 11:00

Matrix: Water

Date Received: 10/15/16 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	252909	10/25/16 16:06	LRW	TAL CAN
Total/NA	Prep	3510C	RE		252867	10/25/16 08:51	CS	TAL CAN
Total/NA	Analysis	8270C	RE	1	253053	10/26/16 20:17	JMG	TAL CAN
Total/NA	Prep	3510C			252314	10/20/16 09:49	JDR	TAL CAN
Total/NA	Analysis	8270C		4	252599	10/22/16 18:25	MRU	TAL CAN
Total/NA	Analysis	RSK-175		1	253107	10/26/16 19:10	BPM	TAL CAN
Total/NA	Prep	8151A			191589	10/18/16 15:30	CBY	TAL PIT
Total/NA	Analysis	8151A		10000	192136	10/25/16 07:53	JMO	TAL PIT
Dissolved	Prep	3005A			251725	10/17/16 14:00	AJC	TAL CAN
Dissolved	Analysis	6020		1	252056	10/19/16 00:48	DSH	TAL CAN
Total/NA	Analysis	2320B-1997		1	252510	10/20/16 15:04	JMB	TAL CAN
Total/NA	Analysis	2340C-1997		1	252065	10/19/16 09:33	TPH	TAL CAN
Total/NA	Analysis	300.0		1	251678	10/15/16 18:37	LKG	TAL CAN
Total/NA	Analysis	300.0		1	251679	10/15/16 18:37	LKG	TAL CAN
Total/NA	Analysis	9060		1	251836	10/17/16 16:12	TPH	TAL CAN

TestAmerica Canton

Lab Chronicle

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Client Sample ID: W-161013-PS-20

Lab Sample ID: 240-70899-5

Date Collected: 10/13/16 11:40

Matrix: Water

Date Received: 10/15/16 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	252909	10/25/16 16:28	LRW	TAL CAN
Total/NA	Prep	3510C	RE		252867	10/25/16 08:51	CS	TAL CAN
Total/NA	Analysis	8270C	RE	1	253053	10/26/16 20:40	JMG	TAL CAN
Total/NA	Prep	3510C			252314	10/20/16 09:49	JDR	TAL CAN
Total/NA	Analysis	8270C		4	252599	10/22/16 18:50	MRU	TAL CAN
Total/NA	Analysis	RSK-175		1	253107	10/26/16 19:28	BPM	TAL CAN
Total/NA	Prep	8151A			191589	10/18/16 15:30	CBY	TAL PIT
Total/NA	Analysis	8151A		10000	192136	10/25/16 08:18	JMO	TAL PIT
Dissolved	Prep	3005A			251725	10/17/16 14:00	AJC	TAL CAN
Dissolved	Analysis	6020		1	252056	10/19/16 00:52	DSH	TAL CAN
Total/NA	Analysis	2320B-1997		1	252510	10/20/16 15:12	JMB	TAL CAN
Total/NA	Analysis	2340C-1997		1	252065	10/19/16 09:38	TPH	TAL CAN
Total/NA	Analysis	300.0		1	251678	10/15/16 13:55	LKG	TAL CAN
Total/NA	Analysis	300.0		1	251679	10/15/16 13:55	LKG	TAL CAN
Total/NA	Analysis	9060		1	251836	10/17/16 17:27	TPH	TAL CAN

Client Sample ID: W-161013-PS-21

Lab Sample ID: 240-70899-6

Date Collected: 10/13/16 12:45

Matrix: Water

Date Received: 10/15/16 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	252909	10/25/16 16:50	LRW	TAL CAN
Total/NA	Prep	3510C	RE		252867	10/25/16 08:51	CS	TAL CAN
Total/NA	Analysis	8270C	RE	1	253053	10/26/16 18:45	JMG	TAL CAN
Total/NA	Prep	3510C			252314	10/20/16 09:49	JDR	TAL CAN
Total/NA	Analysis	8270C		1	252599	10/22/16 16:45	MRU	TAL CAN
Total/NA	Prep	8151A			191589	10/18/16 15:30	CBY	TAL PIT
Total/NA	Analysis	8151A		4	192136	10/24/16 17:14	JMO	TAL PIT
Dissolved	Prep	3005A			251725	10/17/16 14:00	AJC	TAL CAN
Dissolved	Analysis	6020		1	252056	10/19/16 00:57	DSH	TAL CAN

Client Sample ID: W-161013-PS-22

Lab Sample ID: 240-70899-7

Date Collected: 10/13/16 13:10

Matrix: Water

Date Received: 10/15/16 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	252909	10/25/16 17:11	LRW	TAL CAN
Total/NA	Prep	3510C	RE		252867	10/25/16 08:51	CS	TAL CAN
Total/NA	Analysis	8270C	RE	1	253053	10/26/16 19:08	JMG	TAL CAN
Total/NA	Prep	3510C			252314	10/20/16 09:49	JDR	TAL CAN
Total/NA	Analysis	8270C		1	252599	10/22/16 17:10	MRU	TAL CAN
Total/NA	Analysis	RSK-175		1	253107	10/26/16 19:44	BPM	TAL CAN

TestAmerica Canton

Lab Chronicle

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Client Sample ID: W-161013-PS-22

Lab Sample ID: 240-70899-7

Date Collected: 10/13/16 13:10

Matrix: Water

Date Received: 10/15/16 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	8151A			191589	10/18/16 15:30	CBY	TAL PIT
Total/NA	Analysis	8151A		4	192136	10/24/16 18:27	JMO	TAL PIT
Dissolved	Prep	3005A			251725	10/17/16 14:00	AJC	TAL CAN
Dissolved	Analysis	6020		1	252056	10/19/16 01:01	DSH	TAL CAN
Total/NA	Analysis	2320B-1997		1	252510	10/20/16 15:20	JMB	TAL CAN
Total/NA	Analysis	2340C-1997		1	252065	10/19/16 09:43	TPH	TAL CAN
Total/NA	Analysis	300.0		1	251678	10/15/16 14:15	LKG	TAL CAN
Total/NA	Analysis	300.0		1	251679	10/15/16 14:15	LKG	TAL CAN
Total/NA	Analysis	9060		1	251836	10/17/16 17:56	TPH	TAL CAN

Client Sample ID: TRIP BLANK 003

Lab Sample ID: 240-70899-8

Date Collected: 10/13/16 14:00

Matrix: Water

Date Received: 10/15/16 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	252909	10/25/16 17:33	LRW	TAL CAN

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Certification Summary

Client: GHD Services Inc.
Project/Site: 86165-03-11, Penta Wood

TestAmerica Job ID: 240-70899-1

Laboratory: TestAmerica Canton

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Wisconsin	State Program	5	999518190	08-31-17

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
RSK-175		Water	Methane

Laboratory: TestAmerica Pittsburgh

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Wisconsin	State Program	5	998027800	08-31-17

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TestAmerica Canton Sample Receipt Form/Narrative		Login # : <u>70899</u>
Canton Facility		
Client <u>GHD</u>	Site Name _____	Cooler unpacked by: <u>DSO</u>
Cooler Received on <u>10/15/16</u>	Opened on <u>10/15/16</u>	
FedEx: 1 st Grd <input checked="" type="checkbox"/> UPS <input type="checkbox"/> FAS <input type="checkbox"/> Stetson <input type="checkbox"/> Client Drop Off <input type="checkbox"/> TestAmerica Courier <input type="checkbox"/> Other _____		
Receipt After-hours: Drop-off Date/Time		Storage Location
TestAmerica Cooler # _____	Foam Box <input type="checkbox"/>	Client Cooler <input checked="" type="checkbox"/>
Packing material used: Bubble Wrap <input checked="" type="checkbox"/> Foam <input type="checkbox"/> Plastic Bag <input checked="" type="checkbox"/> None <input type="checkbox"/> Other _____		
COOLANT: Wet Ice <input checked="" type="checkbox"/> Blue Ice <input type="checkbox"/> Dry Ice <input type="checkbox"/> Water <input type="checkbox"/> None <input type="checkbox"/>		
1. Cooler temperature upon receipt <input checked="" type="checkbox"/> See Multiple Cooler Form		
IR GUN# IR-8 (CF +0.4 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C		
IR GUN #36 (CF +1.3°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C		
2. Were custody seals on the outside of the cooler(s)? If Yes Quantity <u>1 each</u> Yes No		
-Were custody seals on the outside of the cooler(s) signed & dated? Yes No NA		
-Were custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No		
3. Shippers' packing slip attached to the cooler(s)? Yes <u>NO</u> <u>DSO 10/15/16</u>		
4. Did custody papers accompany the sample(s)? Yes No		
5. Were the custody papers relinquished & signed in the appropriate place? Yes No		
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No		
7. Did all bottles arrive in good condition (Unbroken)? Yes No		
8. Could all bottle labels be reconciled with the COC? Yes No		
9. Were correct bottle(s) used for the test(s) indicated? Yes No		
10. Sufficient quantity received to perform indicated analyses? Yes No		
11. Are these work share samples? Yes No		
If yes, Questions 11-15 have been checked at the originating laboratory.		
11. Were sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# <u>HC574756</u>		
12. Were VOAs on the COC? Yes No		
13. Were air bubbles >6 mm in any VOA vials? Yes No NA		
14. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ Yes No		
15. Was a LL Hg or Me Hg trip blank present? Yes No		
Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other _____		
Concerning _____		

14. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES	Samples processed by: _____
<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	

15. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

16. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

Ref: SOP NC-SC-0005, Sample Receiving
 L:\QA\QC\QA Department\QA TARDIS\Document Control\Work Instructions\In Revision\WI-NC-099-090216 Cooler Receipt Form.doc djl

Temperature readings: _____

Client Sample ID	Lab ID	Container Type	Container	Preservative	Lot #
			pH	Added (mls)	
W-161013-PS-16	240-70899-J-1	Plastic 1 liter - Nitric Acid	<2	_____	_____
W-161013-PS-16	240-70899-L-1	Plastic 500ml - w/ Nitric - Dis.	<2	_____	_____
W-161013-PS-17	240-70899-J-2	Plastic 1 liter - Nitric Acid	<2	_____	_____
W-161013-PS-17	240-70899-L-2	Plastic 500ml - w/ Nitric - Dis.	<2	_____	_____
W-161013-PS-18	240-70899-J-3	Plastic 1 liter - Nitric Acid	<2	_____	_____
W-161013-PS-18	240-70899-L-3	Plastic 500ml - w/ Nitric - Dis.	<2	_____	_____
W-161013-PS-19	240-70899-J-4	Plastic 1 liter - Nitric Acid	<2	_____	_____
W-161013-PS-19	240-70899-L-4	Plastic 500ml - w/ Nitric - Dis.	<2	_____	_____
W-161013-PS-20	240-70899-J-5	Plastic 1 liter - Nitric Acid	<2	_____	_____
W-161013-PS-20	240-70899-L-5	Plastic 500ml - w/ Nitric - Dis.	<2	_____	_____
W-161013-PS-21	240-70899-D-6	Plastic 500ml - w/ Nitric - Dis.	<2	_____	_____
W-161013-PS-22	240-70899-J-7	Plastic 1 liter - Nitric Acid	<2	_____	_____
W-161013-PS-22	240-70899-L-7	Plastic 500ml - w/ Nitric - Dis.	<2	_____	_____

Login Sample Receipt Checklist

Client: GHD Services Inc.

Job Number: 240-70899-1

Login Number: 70899

List Number: 2

Creator: Neri, Tom

List Source: TestAmerica Pittsburgh

List Creation: 10/18/16 12:40 PM

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	2.3
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



Appendix C

Residential Well and Onsite Supply Well Water Sample Laboratory Report and Data Validation

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

TestAmerica Job ID: 240-70705-1

Client Project/Site: 86165-03-12, Penta Wood

For:

GHD Services Inc.
1801 Old Highway 8 NW
Suite 114
St. Paul, Minnesota 55112

Attn: Mr. Grant Anderson

Madonna Myers

Authorized for release by:
10/21/2016 1:54:20 PM

Madonna Myers, Project Manager II
(615)796-1870

madonna.myers@testamericainc.com

Designee for

Denise Heckler, Project Manager II
(330)966-9477

denise.heckler@testamericainc.com

LINKS

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Visit us at:
www.testamericainc.com

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

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

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Definitions/Glossary

Client: GHD Services Inc.
Project/Site: 86165-03-12, Penta Wood

TestAmerica Job ID: 240-70705-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
X	Surrogate is outside control limits

GC Semi VOA

Qualifier	Qualifier Description
J	Reported value was between the limit of detection and the limit of quantitation.
p	The %RPD between the primary and confirmation column/detector is >40%. The lower value has been reported.

Glossary

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

Case Narrative

Client: GHD Services Inc.
Project/Site: 86165-03-12, Penta Wood

TestAmerica Job ID: 240-70705-1

Job ID: 240-70705-1

Laboratory: TestAmerica Canton

Narrative

Job Narrative 240-70705-1

Comments

No additional comments.

Receipt

The samples were received on 10/12/2016 9:20 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 9 coolers at receipt time were 0.6° C, 1.0° C, 1.2° C, 1.4° C, 1.8° C, 2.4° C, 2.6° C, 3.6° C and 4.6° C.

GC/MS VOA

Method(s) 8260B: Surrogate recovery for the following sample was outside of acceptance limits: Trip Blank 001 (240-70705-10). There was insufficient sample to perform a re-extraction; therefore, the data have been reported.

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

GC/MS Semi VOA

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

GC Semi VOA

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

Organic Prep

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

VOA Prep

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

Method Summary

Client: GHD Services Inc.
Project/Site: 86165-03-12, Penta Wood

TestAmerica Job ID: 240-70705-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8270C	Semivolatile Organic Compounds (GC/MS)	SW846	TAL CAN
8151A	Herbicides (GC)	SW846	TAL PIT

Protocol References:

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

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058



Sample Summary

Client: GHD Services Inc.
Project/Site: 86165-03-12, Penta Wood

TestAmerica Job ID: 240-70705-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-70705-1	W-161010-PS-25	Water	10/10/16 11:40	10/12/16 09:20
240-70705-2	W-161010-PS-26	Water	10/10/16 12:15	10/12/16 09:20
240-70705-3	W-161010-PS-27	Water	10/10/16 12:45	10/12/16 09:20
240-70705-4	W-161010-PS-28	Water	10/10/16 13:10	10/12/16 09:20
240-70705-5	W-161010-PS-29	Water	10/10/16 13:40	10/12/16 09:20
240-70705-6	W-161010-PS-30	Water	10/10/16 14:05	10/12/16 09:20
240-70705-7	W-161010-PS-31	Water	10/10/16 14:40	10/12/16 09:20
240-70705-8	W-161010-PS-32	Water	10/10/16 15:00	10/12/16 09:20
240-70705-9	W-161010-PS-33	Water	10/10/16 15:10	10/12/16 09:20
240-70705-10	Trip Blank 001	Water	10/11/16 14:00	10/12/16 09:20



Detection Summary

Client: GHD Services Inc.
Project/Site: 86165-03-12, Penta Wood

TestAmerica Job ID: 240-70705-1

Client Sample ID: W-161010-PS-25

Lab Sample ID: 240-70705-1

No Detections.

Client Sample ID: W-161010-PS-26

Lab Sample ID: 240-70705-2

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Pentachlorophenol	0.020	J p	0.095	0.015	ug/L	4		8151A	Total/NA

Client Sample ID: W-161010-PS-27

Lab Sample ID: 240-70705-3

No Detections.

Client Sample ID: W-161010-PS-28

Lab Sample ID: 240-70705-4

No Detections.

Client Sample ID: W-161010-PS-29

Lab Sample ID: 240-70705-5

No Detections.

Client Sample ID: W-161010-PS-30

Lab Sample ID: 240-70705-6

No Detections.

Client Sample ID: W-161010-PS-31

Lab Sample ID: 240-70705-7

No Detections.

Client Sample ID: W-161010-PS-32

Lab Sample ID: 240-70705-8

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Pentachlorophenol	0.025	J p	0.096	0.015	ug/L	4		8151A	Total/NA

Client Sample ID: W-161010-PS-33

Lab Sample ID: 240-70705-9

Analyte	Result	Qualifier	LOQ	LOD	Unit	Dil Fac	D	Method	Prep Type
Pentachlorophenol	0.024	J p	0.098	0.015	ug/L	4		8151A	Total/NA

Client Sample ID: Trip Blank 001

Lab Sample ID: 240-70705-10

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Canton

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-12, Penta Wood

TestAmerica Job ID: 240-70705-1

Client Sample ID: W-161010-PS-25

Lab Sample ID: 240-70705-1

Date Collected: 10/10/16 11:40

Matrix: Water

Date Received: 10/12/16 09:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/18/16 19:56	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/18/16 19:56	1
Toluene	<0.23		1.0	0.23	ug/L			10/18/16 19:56	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/18/16 19:56	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	100		63 - 132		10/18/16 19:56	1
4-Bromofluorobenzene (Surr)	89		73 - 120		10/18/16 19:56	1
Toluene-d8 (Surr)	99		73 - 124		10/18/16 19:56	1
Dibromofluoromethane (Surr)	100		80 - 120		10/18/16 19:56	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.060		0.19	0.060	ug/L		10/17/16 08:33	10/19/16 10:04	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	85		42 - 120	10/17/16 08:33	10/19/16 10:04	1
2-Fluorophenol (Surr)	45		10 - 120	10/17/16 08:33	10/19/16 10:04	1
2,4,6-Tribromophenol (Surr)	77		35 - 125	10/17/16 08:33	10/19/16 10:04	1
Nitrobenzene-d5 (Surr)	84		36 - 120	10/17/16 08:33	10/19/16 10:04	1
Phenol-d5 (Surr)	26		10 - 120	10/17/16 08:33	10/19/16 10:04	1
Terphenyl-d14 (Surr)	82		17 - 120	10/17/16 08:33	10/19/16 10:04	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.015		0.095	0.015	ug/L		10/14/16 15:00	10/19/16 13:17	4

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	57		18 - 125	10/14/16 15:00	10/19/16 13:17	4

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-12, Penta Wood

TestAmerica Job ID: 240-70705-1

Client Sample ID: W-161010-PS-26

Lab Sample ID: 240-70705-2

Date Collected: 10/10/16 12:15

Matrix: Water

Date Received: 10/12/16 09:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/18/16 20:20	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/18/16 20:20	1
Toluene	<0.23		1.0	0.23	ug/L			10/18/16 20:20	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/18/16 20:20	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	103		63 - 132		10/18/16 20:20	1
4-Bromofluorobenzene (Surr)	96		73 - 120		10/18/16 20:20	1
Toluene-d8 (Surr)	102		73 - 124		10/18/16 20:20	1
Dibromofluoromethane (Surr)	103		80 - 120		10/18/16 20:20	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.060		0.19	0.060	ug/L		10/17/16 08:33	10/19/16 10:28	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	79		42 - 120	10/17/16 08:33	10/19/16 10:28	1
2-Fluorophenol (Surr)	38		10 - 120	10/17/16 08:33	10/19/16 10:28	1
2,4,6-Tribromophenol (Surr)	69		35 - 125	10/17/16 08:33	10/19/16 10:28	1
Nitrobenzene-d5 (Surr)	75		36 - 120	10/17/16 08:33	10/19/16 10:28	1
Phenol-d5 (Surr)	22		10 - 120	10/17/16 08:33	10/19/16 10:28	1
Terphenyl-d14 (Surr)	75		17 - 120	10/17/16 08:33	10/19/16 10:28	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	0.020	J p	0.095	0.015	ug/L		10/14/16 15:00	10/19/16 13:41	4

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	58		18 - 125	10/14/16 15:00	10/19/16 13:41	4

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-12, Penta Wood

TestAmerica Job ID: 240-70705-1

Client Sample ID: W-161010-PS-27

Lab Sample ID: 240-70705-3

Date Collected: 10/10/16 12:45

Matrix: Water

Date Received: 10/12/16 09:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/18/16 20:45	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/18/16 20:45	1
Toluene	<0.23		1.0	0.23	ug/L			10/18/16 20:45	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/18/16 20:45	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	102		63 - 132		10/18/16 20:45	1
4-Bromofluorobenzene (Surr)	94		73 - 120		10/18/16 20:45	1
Toluene-d8 (Surr)	101		73 - 124		10/18/16 20:45	1
Dibromofluoromethane (Surr)	101		80 - 120		10/18/16 20:45	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.061		0.20	0.061	ug/L		10/17/16 08:33	10/19/16 10:51	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	78		42 - 120	10/17/16 08:33	10/19/16 10:51	1
2-Fluorophenol (Surr)	35		10 - 120	10/17/16 08:33	10/19/16 10:51	1
2,4,6-Tribromophenol (Surr)	72		35 - 125	10/17/16 08:33	10/19/16 10:51	1
Nitrobenzene-d5 (Surr)	76		36 - 120	10/17/16 08:33	10/19/16 10:51	1
Phenol-d5 (Surr)	20		10 - 120	10/17/16 08:33	10/19/16 10:51	1
Terphenyl-d14 (Surr)	69		17 - 120	10/17/16 08:33	10/19/16 10:51	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.015		0.097	0.015	ug/L		10/14/16 15:00	10/19/16 14:05	4

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	65		18 - 125	10/14/16 15:00	10/19/16 14:05	4

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-12, Penta Wood

TestAmerica Job ID: 240-70705-1

Client Sample ID: W-161010-PS-28

Lab Sample ID: 240-70705-4

Date Collected: 10/10/16 13:10

Matrix: Water

Date Received: 10/12/16 09:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/18/16 21:07	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/18/16 21:07	1
Toluene	<0.23		1.0	0.23	ug/L			10/18/16 21:07	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/18/16 21:07	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	104		63 - 132		10/18/16 21:07	1
4-Bromofluorobenzene (Surr)	96		73 - 120		10/18/16 21:07	1
Toluene-d8 (Surr)	103		73 - 124		10/18/16 21:07	1
Dibromofluoromethane (Surr)	100		80 - 120		10/18/16 21:07	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.060		0.19	0.060	ug/L		10/17/16 08:33	10/19/16 11:15	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	78		42 - 120	10/17/16 08:33	10/19/16 11:15	1
2-Fluorophenol (Surr)	40		10 - 120	10/17/16 08:33	10/19/16 11:15	1
2,4,6-Tribromophenol (Surr)	70		35 - 125	10/17/16 08:33	10/19/16 11:15	1
Nitrobenzene-d5 (Surr)	81		36 - 120	10/17/16 08:33	10/19/16 11:15	1
Phenol-d5 (Surr)	23		10 - 120	10/17/16 08:33	10/19/16 11:15	1
Terphenyl-d14 (Surr)	72		17 - 120	10/17/16 08:33	10/19/16 11:15	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.015		0.094	0.015	ug/L		10/14/16 15:00	10/19/16 14:30	4

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	59		18 - 125	10/14/16 15:00	10/19/16 14:30	4

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-12, Penta Wood

TestAmerica Job ID: 240-70705-1

Client Sample ID: W-161010-PS-29

Lab Sample ID: 240-70705-5

Date Collected: 10/10/16 13:40

Matrix: Water

Date Received: 10/12/16 09:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/18/16 19:06	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/18/16 19:06	1
Toluene	<0.23		1.0	0.23	ug/L			10/18/16 19:06	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/18/16 19:06	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	78		63 - 132		10/18/16 19:06	1
4-Bromofluorobenzene (Surr)	87		73 - 120		10/18/16 19:06	1
Toluene-d8 (Surr)	85		73 - 124		10/18/16 19:06	1
Dibromofluoromethane (Surr)	80		80 - 120		10/18/16 19:06	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.062		0.20	0.062	ug/L		10/17/16 08:33	10/19/16 11:38	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	83		42 - 120	10/17/16 08:33	10/19/16 11:38	1
2-Fluorophenol (Surr)	41		10 - 120	10/17/16 08:33	10/19/16 11:38	1
2,4,6-Tribromophenol (Surr)	72		35 - 125	10/17/16 08:33	10/19/16 11:38	1
Nitrobenzene-d5 (Surr)	82		36 - 120	10/17/16 08:33	10/19/16 11:38	1
Phenol-d5 (Surr)	24		10 - 120	10/17/16 08:33	10/19/16 11:38	1
Terphenyl-d14 (Surr)	77		17 - 120	10/17/16 08:33	10/19/16 11:38	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.015		0.095	0.015	ug/L		10/14/16 15:00	10/19/16 14:54	4

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	60		18 - 125	10/14/16 15:00	10/19/16 14:54	4

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-12, Penta Wood

TestAmerica Job ID: 240-70705-1

Client Sample ID: W-161010-PS-30

Lab Sample ID: 240-70705-6

Date Collected: 10/10/16 14:05

Matrix: Water

Date Received: 10/12/16 09:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/18/16 19:30	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/18/16 19:30	1
Toluene	<0.23		1.0	0.23	ug/L			10/18/16 19:30	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/18/16 19:30	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	78		63 - 132		10/18/16 19:30	1
4-Bromofluorobenzene (Surr)	91		73 - 120		10/18/16 19:30	1
Toluene-d8 (Surr)	90		73 - 124		10/18/16 19:30	1
Dibromofluoromethane (Surr)	80		80 - 120		10/18/16 19:30	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.060		0.19	0.060	ug/L		10/17/16 08:33	10/20/16 12:49	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	80		42 - 120	10/17/16 08:33	10/20/16 12:49	1
2-Fluorophenol (Surr)	40		10 - 120	10/17/16 08:33	10/20/16 12:49	1
2,4,6-Tribromophenol (Surr)	66		35 - 125	10/17/16 08:33	10/20/16 12:49	1
Nitrobenzene-d5 (Surr)	92		36 - 120	10/17/16 08:33	10/20/16 12:49	1
Phenol-d5 (Surr)	24		10 - 120	10/17/16 08:33	10/20/16 12:49	1
Terphenyl-d14 (Surr)	80		17 - 120	10/17/16 08:33	10/20/16 12:49	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.015		0.095	0.015	ug/L		10/14/16 15:00	10/19/16 16:07	4

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	61		18 - 125	10/14/16 15:00	10/19/16 16:07	4

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-12, Penta Wood

TestAmerica Job ID: 240-70705-1

Client Sample ID: W-161010-PS-31

Lab Sample ID: 240-70705-7

Date Collected: 10/10/16 14:40

Matrix: Water

Date Received: 10/12/16 09:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/18/16 19:54	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/18/16 19:54	1
Toluene	<0.23		1.0	0.23	ug/L			10/18/16 19:54	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/18/16 19:54	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	78		63 - 132		10/18/16 19:54	1
4-Bromofluorobenzene (Surr)	89		73 - 120		10/18/16 19:54	1
Toluene-d8 (Surr)	87		73 - 124		10/18/16 19:54	1
Dibromofluoromethane (Surr)	81		80 - 120		10/18/16 19:54	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.060		0.19	0.060	ug/L		10/17/16 08:33	10/20/16 10:52	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	72		42 - 120	10/17/16 08:33	10/20/16 10:52	1
2-Fluorophenol (Surr)	32		10 - 120	10/17/16 08:33	10/20/16 10:52	1
2,4,6-Tribromophenol (Surr)	63		35 - 125	10/17/16 08:33	10/20/16 10:52	1
Nitrobenzene-d5 (Surr)	72		36 - 120	10/17/16 08:33	10/20/16 10:52	1
Phenol-d5 (Surr)	18		10 - 120	10/17/16 08:33	10/20/16 10:52	1
Terphenyl-d14 (Surr)	75		17 - 120	10/17/16 08:33	10/20/16 10:52	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.015		0.095	0.015	ug/L		10/14/16 15:00	10/19/16 16:31	4

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	53		18 - 125	10/14/16 15:00	10/19/16 16:31	4

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-12, Penta Wood

TestAmerica Job ID: 240-70705-1

Client Sample ID: W-161010-PS-32

Lab Sample ID: 240-70705-8

Date Collected: 10/10/16 15:00

Matrix: Water

Date Received: 10/12/16 09:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/18/16 20:18	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/18/16 20:18	1
Toluene	<0.23		1.0	0.23	ug/L			10/18/16 20:18	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/18/16 20:18	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	77		63 - 132		10/18/16 20:18	1
4-Bromofluorobenzene (Surr)	85		73 - 120		10/18/16 20:18	1
Toluene-d8 (Surr)	86		73 - 124		10/18/16 20:18	1
Dibromofluoromethane (Surr)	80		80 - 120		10/18/16 20:18	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.063		0.20	0.063	ug/L		10/17/16 08:33	10/18/16 10:09	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	80		42 - 120	10/17/16 08:33	10/18/16 10:09	1
2-Fluorophenol (Surr)	31		10 - 120	10/17/16 08:33	10/18/16 10:09	1
2,4,6-Tribromophenol (Surr)	72		35 - 125	10/17/16 08:33	10/18/16 10:09	1
Nitrobenzene-d5 (Surr)	78		36 - 120	10/17/16 08:33	10/18/16 10:09	1
Phenol-d5 (Surr)	18		10 - 120	10/17/16 08:33	10/18/16 10:09	1
Terphenyl-d14 (Surr)	67		17 - 120	10/17/16 08:33	10/18/16 10:09	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	0.025	J p	0.096	0.015	ug/L		10/14/16 15:00	10/19/16 16:56	4

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	65		18 - 125	10/14/16 15:00	10/19/16 16:56	4

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-12, Penta Wood

TestAmerica Job ID: 240-70705-1

Client Sample ID: W-161010-PS-33

Lab Sample ID: 240-70705-9

Date Collected: 10/10/16 15:10

Matrix: Water

Date Received: 10/12/16 09:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/18/16 20:41	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/18/16 20:41	1
Toluene	<0.23		1.0	0.23	ug/L			10/18/16 20:41	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/18/16 20:41	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	81		63 - 132		10/18/16 20:41	1
4-Bromofluorobenzene (Surr)	90		73 - 120		10/18/16 20:41	1
Toluene-d8 (Surr)	88		73 - 124		10/18/16 20:41	1
Dibromofluoromethane (Surr)	84		80 - 120		10/18/16 20:41	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.061		0.20	0.061	ug/L		10/17/16 08:33	10/20/16 11:15	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	75		42 - 120	10/17/16 08:33	10/20/16 11:15	1
2-Fluorophenol (Surr)	32		10 - 120	10/17/16 08:33	10/20/16 11:15	1
2,4,6-Tribromophenol (Surr)	66		35 - 125	10/17/16 08:33	10/20/16 11:15	1
Nitrobenzene-d5 (Surr)	85		36 - 120	10/17/16 08:33	10/20/16 11:15	1
Phenol-d5 (Surr)	20		10 - 120	10/17/16 08:33	10/20/16 11:15	1
Terphenyl-d14 (Surr)	68		17 - 120	10/17/16 08:33	10/20/16 11:15	1

Method: 8151A - Herbicides (GC)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	0.024	J p	0.098	0.015	ug/L		10/14/16 15:00	10/19/16 18:08	4

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	63		18 - 125	10/14/16 15:00	10/19/16 18:08	4

Client Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-12, Penta Wood

TestAmerica Job ID: 240-70705-1

Client Sample ID: Trip Blank 001

Lab Sample ID: 240-70705-10

Date Collected: 10/11/16 14:00

Matrix: Water

Date Received: 10/12/16 09:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/18/16 18:42	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/18/16 18:42	1
Toluene	<0.23		1.0	0.23	ug/L			10/18/16 18:42	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/18/16 18:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	75		63 - 132		10/18/16 18:42	1
4-Bromofluorobenzene (Surr)	83		73 - 120		10/18/16 18:42	1
Toluene-d8 (Surr)	83		73 - 124		10/18/16 18:42	1
Dibromofluoromethane (Surr)	79	X	80 - 120		10/18/16 18:42	1

Surrogate Summary

Client: GHD Services Inc.
Project/Site: 86165-03-12, Penta Wood

TestAmerica Job ID: 240-70705-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		12DCE (63-132)	BFB (73-120)	TOL (73-124)	DBFM (80-120)
240-70705-1	W-161010-PS-25	100	89	99	100
240-70705-2	W-161010-PS-26	103	96	102	103
240-70705-3	W-161010-PS-27	102	94	101	101
240-70705-4	W-161010-PS-28	104	96	103	100
240-70705-5	W-161010-PS-29	78	87	85	80
240-70705-6	W-161010-PS-30	78	91	90	80
240-70705-7	W-161010-PS-31	78	89	87	81
240-70705-8	W-161010-PS-32	77	85	86	80
240-70705-8 MS	W-161010-PS-32	82	93	89	82
240-70705-8 MSD	W-161010-PS-32	76	87	84	83
240-70705-9	W-161010-PS-33	81	90	88	84
240-70705-10	Trip Blank 001	75	83	83	79 X
LCS 240-251900/4	Lab Control Sample	99	97	106	97
LCS 240-251981/5	Lab Control Sample	73	94	90	82
MB 240-251900/7	Method Blank	103	91	105	101
MB 240-251981/8	Method Blank	82	95	91	89

Surrogate Legend

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

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)					
		FBP (42-120)	2FP (10-120)	TBP (35-125)	NBZ (36-120)	PHL (10-120)	TPH (17-120)
240-70705-1	W-161010-PS-25	85	45	77	84	26	82
240-70705-2	W-161010-PS-26	79	38	69	75	22	75
240-70705-3	W-161010-PS-27	78	35	72	76	20	69
240-70705-4	W-161010-PS-28	78	40	70	81	23	72
240-70705-5	W-161010-PS-29	83	41	72	82	24	77
240-70705-6	W-161010-PS-30	80	40	66	92	24	80
240-70705-7	W-161010-PS-31	72	32	63	72	18	75
240-70705-8	W-161010-PS-32	80	31	72	78	18	67
240-70705-8 MS	W-161010-PS-32	82	30	73	80	16	66
240-70705-8 MSD	W-161010-PS-32	82	34	74	86	19	66
240-70705-9	W-161010-PS-33	75	32	66	85	20	68
LCS 240-251667/23-A	Lab Control Sample	93	65	86	89	43	96
MB 240-251667/22-A	Method Blank	86	63	74	82	44	98

Surrogate Legend

FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14 (Surr)

TestAmerica Canton

Surrogate Summary

Client: GHD Services Inc.
Project/Site: 86165-03-12, Penta Wood

TestAmerica Job ID: 240-70705-1

Method: 8151A - Herbicides (GC)

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	DCPA1	DCPA2
		(18-125)	(18-125)
240-70705-1	W-161010-PS-25	51	57
240-70705-2	W-161010-PS-26	52	58
240-70705-3	W-161010-PS-27	57	65
240-70705-4	W-161010-PS-28	53	59
240-70705-5	W-161010-PS-29	54	60
240-70705-6	W-161010-PS-30	56	61
240-70705-7	W-161010-PS-31	46	53
240-70705-8	W-161010-PS-32	59	65
240-70705-8 MS	W-161010-PS-32	71	78
240-70705-8 MSD	W-161010-PS-32	68	74
240-70705-9	W-161010-PS-33	58	63
LCS 180-191251/2-A	Lab Control Sample	76	85
MB 180-191251/1-A	Method Blank	96	106

Surrogate Legend

DCPA = 2,4-Dichlorophenylacetic acid

QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-12, Penta Wood

TestAmerica Job ID: 240-70705-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-251900/7
Matrix: Water
Analysis Batch: 251900

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/18/16 13:06	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/18/16 13:06	1
Toluene	<0.23		1.0	0.23	ug/L			10/18/16 13:06	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/18/16 13:06	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	103		63 - 132		10/18/16 13:06	1
4-Bromofluorobenzene (Surr)	91		73 - 120		10/18/16 13:06	1
Toluene-d8 (Surr)	105		73 - 124		10/18/16 13:06	1
Dibromofluoromethane (Surr)	101		80 - 120		10/18/16 13:06	1

Lab Sample ID: LCS 240-251900/4
Matrix: Water
Analysis Batch: 251900

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	20.0	21.0		ug/L		105	80 - 120
Ethylbenzene	20.0	21.5		ug/L		107	80 - 120
Toluene	20.0	22.2		ug/L		111	80 - 121
Xylenes, Total	40.0	42.3		ug/L		106	80 - 120
m-Xylene & p-Xylene	20.0	21.2		ug/L		106	80 - 120
o-Xylene	20.0	21.1		ug/L		106	80 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	99		63 - 132
4-Bromofluorobenzene (Surr)	97		73 - 120
Toluene-d8 (Surr)	106		73 - 124
Dibromofluoromethane (Surr)	97		80 - 120

Lab Sample ID: MB 240-251981/8
Matrix: Water
Analysis Batch: 251981

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

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.28		0.50	0.28	ug/L			10/18/16 16:41	1
Ethylbenzene	<0.26		1.0	0.26	ug/L			10/18/16 16:41	1
Toluene	<0.23		1.0	0.23	ug/L			10/18/16 16:41	1
Xylenes, Total	<0.24		2.0	0.24	ug/L			10/18/16 16:41	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	82		63 - 132		10/18/16 16:41	1
4-Bromofluorobenzene (Surr)	95		73 - 120		10/18/16 16:41	1
Toluene-d8 (Surr)	91		73 - 124		10/18/16 16:41	1
Dibromofluoromethane (Surr)	89		80 - 120		10/18/16 16:41	1

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QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-12, Penta Wood

TestAmerica Job ID: 240-70705-1

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

Lab Sample ID: LCS 240-251981/5
Matrix: Water
Analysis Batch: 251981

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	20.0	19.9		ug/L		100	80 - 120
Ethylbenzene	20.0	21.2		ug/L		106	80 - 120
Toluene	20.0	20.1		ug/L		100	80 - 121
Xylenes, Total	40.0	40.8		ug/L		102	80 - 120
m-Xylene & p-Xylene	20.0	20.8		ug/L		104	80 - 120
o-Xylene	20.0	20.0		ug/L		100	80 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	73		63 - 132
4-Bromofluorobenzene (Surr)	94		73 - 120
Toluene-d8 (Surr)	90		73 - 124
Dibromofluoromethane (Surr)	82		80 - 120

Lab Sample ID: 240-70705-8 MS
Matrix: Water
Analysis Batch: 251981

Client Sample ID: W-161010-PS-32
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	<0.28		20.0	18.3		ug/L		91	67 - 126
Ethylbenzene	<0.26		20.0	18.8		ug/L		94	66 - 123
Toluene	<0.23		20.0	18.1		ug/L		91	63 - 130
Xylenes, Total	<0.24		40.0	36.7		ug/L		92	60 - 126
m-Xylene & p-Xylene	<0.24		20.0	18.6		ug/L		93	58 - 127
o-Xylene	<0.28		20.0	18.1		ug/L		90	61 - 126

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	82		63 - 132
4-Bromofluorobenzene (Surr)	93		73 - 120
Toluene-d8 (Surr)	89		73 - 124
Dibromofluoromethane (Surr)	82		80 - 120

Lab Sample ID: 240-70705-8 MSD
Matrix: Water
Analysis Batch: 251981

Client Sample ID: W-161010-PS-32
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	<0.28		20.0	18.4		ug/L		92	67 - 126	1	31
Ethylbenzene	<0.26		20.0	17.6		ug/L		88	66 - 123	6	34
Toluene	<0.23		20.0	17.8		ug/L		89	63 - 130	2	33
Xylenes, Total	<0.24		40.0	35.7		ug/L		89	60 - 126	3	35
m-Xylene & p-Xylene	<0.24		20.0	17.9		ug/L		89	58 - 127	4	35
o-Xylene	<0.28		20.0	17.8		ug/L		89	61 - 126	2	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	76		63 - 132
4-Bromofluorobenzene (Surr)	87		73 - 120
Toluene-d8 (Surr)	84		73 - 124

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QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-12, Penta Wood

TestAmerica Job ID: 240-70705-1

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

Lab Sample ID: 240-70705-8 MSD
Matrix: Water
Analysis Batch: 251981

Client Sample ID: W-161010-PS-32
Prep Type: Total/NA

Surrogate	MSD		Limits
	%Recovery	Qualifier	
Dibromofluoromethane (Surr)	83		80 - 120

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-251667/22-A
Matrix: Water
Analysis Batch: 251864

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 251667

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	<0.063		0.20	0.063	ug/L		10/17/16 08:33	10/18/16 08:35	1
Surrogate	MB MB		Limits			D	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier							
2-Fluorobiphenyl (Surr)	86		42 - 120				10/17/16 08:33	10/18/16 08:35	1
2-Fluorophenol (Surr)	63		10 - 120				10/17/16 08:33	10/18/16 08:35	1
2,4,6-Tribromophenol (Surr)	74		35 - 125				10/17/16 08:33	10/18/16 08:35	1
Nitrobenzene-d5 (Surr)	82		36 - 120				10/17/16 08:33	10/18/16 08:35	1
Phenol-d5 (Surr)	44		10 - 120				10/17/16 08:33	10/18/16 08:35	1
Terphenyl-d14 (Surr)	98		17 - 120				10/17/16 08:33	10/18/16 08:35	1

Lab Sample ID: LCS 240-251667/23-A
Matrix: Water
Analysis Batch: 251864

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 251667

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Naphthalene	20.0	17.6		ug/L		88	54 - 120
Surrogate	LCS LCS		Limits			%Rec	Limits
	%Recovery	Qualifier					
2-Fluorobiphenyl (Surr)	93		42 - 120				
2-Fluorophenol (Surr)	65		10 - 120				
2,4,6-Tribromophenol (Surr)	86		35 - 125				
Nitrobenzene-d5 (Surr)	89		36 - 120				
Phenol-d5 (Surr)	43		10 - 120				
Terphenyl-d14 (Surr)	96		17 - 120				

Lab Sample ID: 240-70705-8 MS
Matrix: Water
Analysis Batch: 251864

Client Sample ID: W-161010-PS-32
Prep Type: Total/NA
Prep Batch: 251667

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Naphthalene	<0.063		19.8	14.8		ug/L		74	37 - 120
Surrogate	MS MS		Limits			Unit	D	%Rec	Limits
	%Recovery	Qualifier							
2-Fluorobiphenyl (Surr)	82		42 - 120						
2-Fluorophenol (Surr)	30		10 - 120						
2,4,6-Tribromophenol (Surr)	73		35 - 125						
Nitrobenzene-d5 (Surr)	80		36 - 120						
Phenol-d5 (Surr)	16		10 - 120						

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QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-12, Penta Wood

TestAmerica Job ID: 240-70705-1

Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-70705-8 MS
Matrix: Water
Analysis Batch: 251864

Client Sample ID: W-161010-PS-32
Prep Type: Total/NA
Prep Batch: 251667

Surrogate	MS %Recovery	MS Qualifier	Limits
Terphenyl-d14 (Surr)	66		17 - 120

Lab Sample ID: 240-70705-8 MSD
Matrix: Water
Analysis Batch: 251864

Client Sample ID: W-161010-PS-32
Prep Type: Total/NA
Prep Batch: 251667

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Naphthalene	<0.063		19.6	15.1		ug/L		77	37 - 120	2	33

Surrogate	MSD %Recovery	MSD Qualifier	Limits
2-Fluorobiphenyl (Surr)	82		42 - 120
2-Fluorophenol (Surr)	34		10 - 120
2,4,6-Tribromophenol (Surr)	74		35 - 125
Nitrobenzene-d5 (Surr)	86		36 - 120
Phenol-d5 (Surr)	19		10 - 120
Terphenyl-d14 (Surr)	66		17 - 120

Method: 8151A - Herbicides (GC)

Lab Sample ID: MB 180-191251/1-A
Matrix: Water
Analysis Batch: 191643

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 191251

Analyte	MB Result	MB Qualifier	LOQ	LOD	Unit	D	Prepared	Analyzed	Dil Fac
Pentachlorophenol	<0.016		0.10	0.016	ug/L		10/14/16 15:00	10/19/16 19:19	4

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	106		18 - 125	10/14/16 15:00	10/19/16 19:19	4

Lab Sample ID: LCS 180-191251/2-A
Matrix: Water
Analysis Batch: 191643

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 191251

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Pentachlorophenol	10.0	12.2		ug/L		122	30 - 150

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2,4-Dichlorophenylacetic acid	85		18 - 125

Lab Sample ID: 240-70705-8 MS
Matrix: Water
Analysis Batch: 191643

Client Sample ID: W-161010-PS-32
Prep Type: Total/NA
Prep Batch: 191251

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Pentachlorophenol	0.025	J p	0.962	1.16		ug/L		118	30 - 150

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QC Sample Results

Client: GHD Services Inc.
Project/Site: 86165-03-12, Penta Wood

TestAmerica Job ID: 240-70705-1

Method: 8151A - Herbicides (GC) (Continued)

Lab Sample ID: 240-70705-8 MS
Matrix: Water
Analysis Batch: 191643

Client Sample ID: W-161010-PS-32
Prep Type: Total/NA
Prep Batch: 191251

	MS	MS	
Surrogate	%Recovery	Qualifier	Limits
2,4-Dichlorophenylacetic acid	78		18 - 125

Lab Sample ID: 240-70705-8 MSD
Matrix: Water
Analysis Batch: 191643

Client Sample ID: W-161010-PS-32
Prep Type: Total/NA
Prep Batch: 191251

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Pentachlorophenol	0.025	J p	0.962	1.26		ug/L		129	30 - 150	8	35

	MSD	MSD	
Surrogate	%Recovery	Qualifier	Limits
2,4-Dichlorophenylacetic acid	74		18 - 125

- 1
- 2
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- 10
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- 12
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- 14
- 15

QC Association Summary

Client: GHD Services Inc.
Project/Site: 86165-03-12, Penta Wood

TestAmerica Job ID: 240-70705-1

GC/MS VOA

Analysis Batch: 251900

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70705-1	W-161010-PS-25	Total/NA	Water	8260B	
240-70705-2	W-161010-PS-26	Total/NA	Water	8260B	
240-70705-3	W-161010-PS-27	Total/NA	Water	8260B	
240-70705-4	W-161010-PS-28	Total/NA	Water	8260B	
MB 240-251900/7	Method Blank	Total/NA	Water	8260B	
LCS 240-251900/4	Lab Control Sample	Total/NA	Water	8260B	

Analysis Batch: 251981

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70705-5	W-161010-PS-29	Total/NA	Water	8260B	
240-70705-6	W-161010-PS-30	Total/NA	Water	8260B	
240-70705-7	W-161010-PS-31	Total/NA	Water	8260B	
240-70705-8	W-161010-PS-32	Total/NA	Water	8260B	
240-70705-9	W-161010-PS-33	Total/NA	Water	8260B	
240-70705-10	Trip Blank 001	Total/NA	Water	8260B	
MB 240-251981/8	Method Blank	Total/NA	Water	8260B	
LCS 240-251981/5	Lab Control Sample	Total/NA	Water	8260B	
240-70705-8 MS	W-161010-PS-32	Total/NA	Water	8260B	
240-70705-8 MSD	W-161010-PS-32	Total/NA	Water	8260B	

GC/MS Semi VOA

Prep Batch: 251667

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70705-1	W-161010-PS-25	Total/NA	Water	3510C	
240-70705-2	W-161010-PS-26	Total/NA	Water	3510C	
240-70705-3	W-161010-PS-27	Total/NA	Water	3510C	
240-70705-4	W-161010-PS-28	Total/NA	Water	3510C	
240-70705-5	W-161010-PS-29	Total/NA	Water	3510C	
240-70705-6	W-161010-PS-30	Total/NA	Water	3510C	
240-70705-7	W-161010-PS-31	Total/NA	Water	3510C	
240-70705-8	W-161010-PS-32	Total/NA	Water	3510C	
240-70705-9	W-161010-PS-33	Total/NA	Water	3510C	
MB 240-251667/22-A	Method Blank	Total/NA	Water	3510C	
LCS 240-251667/23-A	Lab Control Sample	Total/NA	Water	3510C	
240-70705-8 MS	W-161010-PS-32	Total/NA	Water	3510C	
240-70705-8 MSD	W-161010-PS-32	Total/NA	Water	3510C	

Analysis Batch: 251864

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70705-8	W-161010-PS-32	Total/NA	Water	8270C	251667
MB 240-251667/22-A	Method Blank	Total/NA	Water	8270C	251667
LCS 240-251667/23-A	Lab Control Sample	Total/NA	Water	8270C	251667
240-70705-8 MS	W-161010-PS-32	Total/NA	Water	8270C	251667
240-70705-8 MSD	W-161010-PS-32	Total/NA	Water	8270C	251667

Analysis Batch: 252071

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70705-1	W-161010-PS-25	Total/NA	Water	8270C	251667
240-70705-2	W-161010-PS-26	Total/NA	Water	8270C	251667

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QC Association Summary

Client: GHD Services Inc.
Project/Site: 86165-03-12, Penta Wood

TestAmerica Job ID: 240-70705-1

GC/MS Semi VOA (Continued)

Analysis Batch: 252071 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70705-3	W-161010-PS-27	Total/NA	Water	8270C	251667
240-70705-4	W-161010-PS-28	Total/NA	Water	8270C	251667
240-70705-5	W-161010-PS-29	Total/NA	Water	8270C	251667

Analysis Batch: 252265

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70705-6	W-161010-PS-30	Total/NA	Water	8270C	251667
240-70705-7	W-161010-PS-31	Total/NA	Water	8270C	251667
240-70705-9	W-161010-PS-33	Total/NA	Water	8270C	251667

GC Semi VOA

Prep Batch: 191251

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70705-1	W-161010-PS-25	Total/NA	Water	8151A	
240-70705-2	W-161010-PS-26	Total/NA	Water	8151A	
240-70705-3	W-161010-PS-27	Total/NA	Water	8151A	
240-70705-4	W-161010-PS-28	Total/NA	Water	8151A	
240-70705-5	W-161010-PS-29	Total/NA	Water	8151A	
240-70705-6	W-161010-PS-30	Total/NA	Water	8151A	
240-70705-7	W-161010-PS-31	Total/NA	Water	8151A	
240-70705-8	W-161010-PS-32	Total/NA	Water	8151A	
240-70705-9	W-161010-PS-33	Total/NA	Water	8151A	
MB 180-191251/1-A	Method Blank	Total/NA	Water	8151A	
LCS 180-191251/2-A	Lab Control Sample	Total/NA	Water	8151A	
240-70705-8 MS	W-161010-PS-32	Total/NA	Water	8151A	
240-70705-8 MSD	W-161010-PS-32	Total/NA	Water	8151A	

Analysis Batch: 191643

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-70705-1	W-161010-PS-25	Total/NA	Water	8151A	191251
240-70705-2	W-161010-PS-26	Total/NA	Water	8151A	191251
240-70705-3	W-161010-PS-27	Total/NA	Water	8151A	191251
240-70705-4	W-161010-PS-28	Total/NA	Water	8151A	191251
240-70705-5	W-161010-PS-29	Total/NA	Water	8151A	191251
240-70705-6	W-161010-PS-30	Total/NA	Water	8151A	191251
240-70705-7	W-161010-PS-31	Total/NA	Water	8151A	191251
240-70705-8	W-161010-PS-32	Total/NA	Water	8151A	191251
240-70705-9	W-161010-PS-33	Total/NA	Water	8151A	191251
MB 180-191251/1-A	Method Blank	Total/NA	Water	8151A	191251
LCS 180-191251/2-A	Lab Control Sample	Total/NA	Water	8151A	191251
240-70705-8 MS	W-161010-PS-32	Total/NA	Water	8151A	191251
240-70705-8 MSD	W-161010-PS-32	Total/NA	Water	8151A	191251

Lab Chronicle

Client: GHD Services Inc.
Project/Site: 86165-03-12, Penta Wood

TestAmerica Job ID: 240-70705-1

Client Sample ID: W-161010-PS-25

Date Collected: 10/10/16 11:40

Date Received: 10/12/16 09:20

Lab Sample ID: 240-70705-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	251900	10/18/16 19:56	HMB	TAL CAN
Total/NA	Prep	3510C			251667	10/17/16 08:33	CS	TAL CAN
Total/NA	Analysis	8270C		1	252071	10/19/16 10:04	JMG	TAL CAN
Total/NA	Prep	8151A			191251	10/14/16 15:00	CBY	TAL PIT
Total/NA	Analysis	8151A		4	191643	10/19/16 13:17	JMO	TAL PIT

Client Sample ID: W-161010-PS-26

Date Collected: 10/10/16 12:15

Date Received: 10/12/16 09:20

Lab Sample ID: 240-70705-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	251900	10/18/16 20:20	HMB	TAL CAN
Total/NA	Prep	3510C			251667	10/17/16 08:33	CS	TAL CAN
Total/NA	Analysis	8270C		1	252071	10/19/16 10:28	JMG	TAL CAN
Total/NA	Prep	8151A			191251	10/14/16 15:00	CBY	TAL PIT
Total/NA	Analysis	8151A		4	191643	10/19/16 13:41	JMO	TAL PIT

Client Sample ID: W-161010-PS-27

Date Collected: 10/10/16 12:45

Date Received: 10/12/16 09:20

Lab Sample ID: 240-70705-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	251900	10/18/16 20:45	HMB	TAL CAN
Total/NA	Prep	3510C			251667	10/17/16 08:33	CS	TAL CAN
Total/NA	Analysis	8270C		1	252071	10/19/16 10:51	JMG	TAL CAN
Total/NA	Prep	8151A			191251	10/14/16 15:00	CBY	TAL PIT
Total/NA	Analysis	8151A		4	191643	10/19/16 14:05	JMO	TAL PIT

Client Sample ID: W-161010-PS-28

Date Collected: 10/10/16 13:10

Date Received: 10/12/16 09:20

Lab Sample ID: 240-70705-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	251900	10/18/16 21:07	HMB	TAL CAN
Total/NA	Prep	3510C			251667	10/17/16 08:33	CS	TAL CAN
Total/NA	Analysis	8270C		1	252071	10/19/16 11:15	JMG	TAL CAN
Total/NA	Prep	8151A			191251	10/14/16 15:00	CBY	TAL PIT
Total/NA	Analysis	8151A		4	191643	10/19/16 14:30	JMO	TAL PIT

TestAmerica Canton

Lab Chronicle

Client: GHD Services Inc.
Project/Site: 86165-03-12, Penta Wood

TestAmerica Job ID: 240-70705-1

Client Sample ID: W-161010-PS-29

Lab Sample ID: 240-70705-5

Date Collected: 10/10/16 13:40

Matrix: Water

Date Received: 10/12/16 09:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	251981	10/18/16 19:06	HMB	TAL CAN
Total/NA	Prep	3510C			251667	10/17/16 08:33	CS	TAL CAN
Total/NA	Analysis	8270C		1	252071	10/19/16 11:38	JMG	TAL CAN
Total/NA	Prep	8151A			191251	10/14/16 15:00	CBY	TAL PIT
Total/NA	Analysis	8151A		4	191643	10/19/16 14:54	JMO	TAL PIT

Client Sample ID: W-161010-PS-30

Lab Sample ID: 240-70705-6

Date Collected: 10/10/16 14:05

Matrix: Water

Date Received: 10/12/16 09:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	251981	10/18/16 19:30	HMB	TAL CAN
Total/NA	Prep	3510C			251667	10/17/16 08:33	CS	TAL CAN
Total/NA	Analysis	8270C		1	252265	10/20/16 12:49	JMG	TAL CAN
Total/NA	Prep	8151A			191251	10/14/16 15:00	CBY	TAL PIT
Total/NA	Analysis	8151A		4	191643	10/19/16 16:07	JMO	TAL PIT

Client Sample ID: W-161010-PS-31

Lab Sample ID: 240-70705-7

Date Collected: 10/10/16 14:40

Matrix: Water

Date Received: 10/12/16 09:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	251981	10/18/16 19:54	HMB	TAL CAN
Total/NA	Prep	3510C			251667	10/17/16 08:33	CS	TAL CAN
Total/NA	Analysis	8270C		1	252265	10/20/16 10:52	JMG	TAL CAN
Total/NA	Prep	8151A			191251	10/14/16 15:00	CBY	TAL PIT
Total/NA	Analysis	8151A		4	191643	10/19/16 16:31	JMO	TAL PIT

Client Sample ID: W-161010-PS-32

Lab Sample ID: 240-70705-8

Date Collected: 10/10/16 15:00

Matrix: Water

Date Received: 10/12/16 09:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	251981	10/18/16 20:18	HMB	TAL CAN
Total/NA	Prep	3510C			251667	10/17/16 08:33	CS	TAL CAN
Total/NA	Analysis	8270C		1	251864	10/18/16 10:09	JMG	TAL CAN
Total/NA	Prep	8151A			191251	10/14/16 15:00	CBY	TAL PIT
Total/NA	Analysis	8151A		4	191643	10/19/16 16:56	JMO	TAL PIT

TestAmerica Canton

Lab Chronicle

Client: GHD Services Inc.
Project/Site: 86165-03-12, Penta Wood

TestAmerica Job ID: 240-70705-1

Client Sample ID: W-161010-PS-33

Lab Sample ID: 240-70705-9

Date Collected: 10/10/16 15:10

Matrix: Water

Date Received: 10/12/16 09:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	251981	10/18/16 20:41	HMB	TAL CAN
Total/NA	Prep	3510C			251667	10/17/16 08:33	CS	TAL CAN
Total/NA	Analysis	8270C		1	252265	10/20/16 11:15	JMG	TAL CAN
Total/NA	Prep	8151A			191251	10/14/16 15:00	CBY	TAL PIT
Total/NA	Analysis	8151A		4	191643	10/19/16 18:08	JMO	TAL PIT

Client Sample ID: Trip Blank 001

Lab Sample ID: 240-70705-10

Date Collected: 10/11/16 14:00

Matrix: Water

Date Received: 10/12/16 09:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	251981	10/18/16 18:42	HMB	TAL CAN

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Certification Summary

Client: GHD Services Inc.
Project/Site: 86165-03-12, Penta Wood

TestAmerica Job ID: 240-70705-1

Laboratory: TestAmerica Canton

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Wisconsin	State Program	5	999518190	08-31-17

Laboratory: TestAmerica Pittsburgh

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Wisconsin	State Program	5	998027800	08-31-17

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TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 70705

Client G7 HD Site Name _____ Cooler unpacked by: DSD
 Cooler Received on 10/12/16 Opened on 10/12/16
 FedEx: 1st Grd Exp UPS FAS Stetson Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ **Storage Location** _____

TestAmerica Cooler # _____ Foam Box Client Cooler Box Other _____
 Packing material used: Bubble Wrap Foam Plastic Bag None Other _____
 COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt See Multiple Cooler Form
 IR GUN# IR-8 (CF +0.4 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
 IR GUN #36 (CF +1.3 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were custody seals on the outside of the cooler(s)? If Yes Quantity 2 each Yes No
 -Were custody seals on the outside of the cooler(s) signed & dated? Yes No NA
 -Were custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels be reconciled with the COC? Yes No
9. Were correct bottle(s) used for the test(s) indicated? Yes No
10. Sufficient quantity received to perform indicated analyses? Yes No
11. Are these work share samples? Yes No
 If yes, Questions 11-15 have been checked at the originating laboratory.
11. Were sample(s) at the correct pH upon receipt? No NA pH Strip Lot# HC574756
12. Were VOAs on the COC? No
13. Were air bubbles >6 mm in any VOA vials? Yes NA
14. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ Yes No
15. Was a LL Hg or Me Hg trip blank present? Yes No

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other _____
 Concerning _____

14. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by: [Signature]

15. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
 Sample(s) _____ were received in a broken container.
 Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

16. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
 Time preserved: _____ Preservative(s) added/Lot number(s): _____



Temperature Controlled



IF THIS SHIPMENT IS DELAYED IN TRANSIT, STORE AS INDICATED.

- Healthcare
- Room Temperature
15° to 25° C / 59° to 77° F
- Refrigerated
2° to 8° C / 36° to 47° F
- Frozen
-25° to -10° C / -13° to 14° F

167073 REV 9/15

4101 SHUFFEL DR
NORTH CANTON, OH 44720
UNITED STATES US

BILL RECEIPT

**TO ENVIRONMENTAL SAMPLE RECEIPT
TESTAMERICA PITTSBURGH
301 ALPHA DRIVE
RIDC PARK
PITTSBURGH PA 15238**

(412) 963-7058
DEPT: AL HAIDET

REF: 6240-38051



FedEx Express



AN 10218091E151F

TRK# 0201 7070 5879 3679

**THU - 13 OCT 3:00P
STANDARD OVERNIGHT**

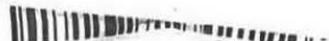
65 AGCA

**15238
PIT**

Uncorrected temp 1.9/1.4 °C
Thermometer ID 9

CF 0.5 Initials TS

PT-WI-SR-001 effective 7/26/13



Temperature Controlled

IF THIS SHIPMENT IS DELAYED IN TRANSIT, STORE AS INDICATED.

- Healthcare
- Room Temperature
15° to 25° C / 59° to 77° F
- Refrigerated
2° to 8° C / 36° to 47° F
- Frozen
-25° to -10° C / -13° to 14° F

167073 REV 9/15

ORIGIN ID: PHDA (356) 888
AL HAIDET
TEST AMERICA
4101 SHUFFEL DR
NORTH CANTON, OH 44720
UNITED STATES US

ACTIVITY ID: 507102/GAPE2912
CAD: 507102/GAPE2912

BILL RECEIPT

**TO ENVIRONMENTAL SAMPLE RECEIPT
TESTAMERICA PITTSBURGH
301 ALPHA DRIVE
RIDC PARK
PITTSBURGH PA 15238**

(412) 963-7058
DEPT: AL HAIDET

REF: 6240-38051



FedEx Express



J1513150613001W

TRK# 0201 7070 5879 3680

**THU - 13 OCT 10:30A
PRIORITY OVERNIGHT**

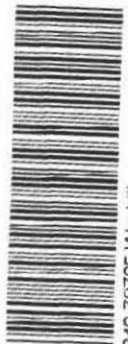
65 AGCA

15238

Uncorrected temp 2.3/1.8 °C
Thermometer ID 9

CF 0.5 Initials TS

PT-WI-SR-001 effective 7/26/13



240-70705 Waybill



FedEx Express Temperature Controlled

IF THIS SHIPMENT IS DELAYED IN TRANSIT, STORE AS INDICATED.

- Healthcare
- Room Temperature 15° to 25° C / 59° to 77° F
- Refrigerated 2° to 8° C / 36° to 47° F
- Frozen -25° to -10° C / -13° to 14° F

FedEx Express Temperature Controlled

IF THIS SHIPMENT IS DELAYED IN TRANSIT, STORE AS INDICATED.

- Healthcare
- Room Temperature 15° to 25° C / 59° to 77° F
- Refrigerated 2° to 8° C / 36° to 47° F
- Frozen -25° to -10° C / -13° to 14° F

ORIGIN ID: PPHD (3507) 800
 AL HAIDET
 TEST AMERICA
 4101 SHUFFEL DR
 NORTH CANTON, OH 44720
 UNITED STATES US

ACT: 102
 CAD: 507102/CAFE2912

BILL RECIPIENT

TO ENVIRONMENTAL SAMPLE RECEIPT
 TESTAMERICA PITTSBURGH
 301 ALPHA DRIVE
 RIDC PARK
 PITTSBURGH PA 15238
 REF: S240-38051

(412) 963-7068
 DEPT: AL HAIDET

4101 SHUFFEL DR
 NORTH CANTON, OH 44720
 UNITED STATES US

BILL RECIPIENT

TO ENVIRONMENTAL SAMPLE RECEIPT
 TESTAMERICA PITTSBURGH
 301 ALPHA DRIVE
 RIDC PARK
 PITTSBURGH PA 15238
 (412) 963-7068
 DEPT: AL HAIDET
 REF: S240-38051

FedEx Express

E

FedEx Express

E

TRK# 0201 7070 5879 3679

THU - 13 OCT 3:00P
 STANDARD OVERNIGHT

15238
 PA-US PIT

TRK# 0201 7070 5879 3680

THU - 13 OCT 10:30A
 PRIORITY OVERNIGHT

15238

FF AGCA

Uncorrected temp 1.9/1.4 °C
 Thermometer ID 9
 CF -0.5 Initials TS

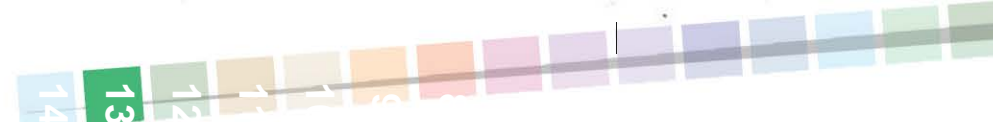
PT-WI-SR-001 effective 7/26/13

65 AGCA

Uncorrected temp 2.3/1.8 °C
 Thermometer ID 9
 CF -0.5 Initials TS

PT-WI-SR-001 effective 7/26/13

240-70705 Waybill



TestAmerica Canton

4101 Shuffel Street NW
 North Canton, OH 44720
 Phone (330) 497-9396 Fax (330) 497-0772

Chain of Custody Record



240-70705 Chain of Custody

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab) Client Contact: Shipping/Receiving Company: TestAmerica Laboratories, Inc. Address: 301 Alpha Drive, RIDC Park, Pittsburgh, PA, 15238 Phone: 412-963-7058(Tel) 412-963-2468(Fax) Email: Project Name: 86165-03-12, Penia Wood Site:				Sampler: Heckler, Denise D		Lab PM: Heckler, Denise D		E-Mail: denise.heckler@testamericainc.com		COC No: 240-62184.1					
				Phone:		Due Date Requested: 10/24/2016		TAT Requested (days):		Job #: 240-70705-1		Page: Page 1 of 1			
PO #: WO #: Project #: 24012755 SSOW#:				Analysis Requested								Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Z - other (specify)			
Other:				Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		8151A8151A_AP (MOD) Pentachlorophenol		Total Number of containers		Special Instructions/Note:			
Sample Identification - Client ID (Lab ID)				Sample Date		Sample Time		Sample Type (C=comp, G=grab)		Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)		Preservation Code:			
W-161010-PS-33 (240-70705-9)				10/10/16		15:10 Eastern		Water		X		1 WI Use 200 ul spike, and x4 dilution			
Possible Hazard Identification Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify)				Primary Deliverable Rank: 2		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months								Special Instructions/QC Requirements:	
Empty Kit Relinquished by:				Date:		Time:		Method of Shipment:							
Relinquished by: <i>Ryker</i>				Date/Time: 10-12-2016		Company:		Received by: <i>CO Amos Day</i>		Date/Time: 10/13/16 9:00		Company: Test America			
Relinquished by:				Date/Time:		Company:		Received by:		Date/Time:		Company:			
Relinquished by:				Date/Time:		Company:		Received by:		Date/Time:		Company:			
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No				Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:									

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10/21/2016



TestAmerica Canton

4101 Shuffel Street NW
 North Canton, OH 44720
 Phone (330) 497-9396 Fax (330) 497-0772

Chain of Custody Record



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

240-70705 Chain of Custody

Client Information (Sub Contract Lab)	Sampler: Heckler, Denise C	Lab PM: Heckler, Denise C	COC No: 240-62178.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: denise.heckler@testamericainc.com	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.	Analysis Requested		Job #: 240-70705-1

Address: 301 Alpha Drive, RIDC Park, City: Pittsburgh State, Zip: PA, 15238	Due Date Requested: 10/24/2016	Field Filtered Sample (Yes or No) Perform: MS/MSD (Yes or No) 8151A18151A_AP (MOD) Pentachlorophenol	Total Number of containers	Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Z - other (specify)
City: Pittsburgh	TAT Requested (days):			
State, Zip: PA, 15238	PO #:			
Phone: 412-963-7058(Tel) 412-963-2468(Fax)	WO #:			
Email:	Project #: 24012755			
Project Name: 86165-03-12, Penta Wood	SSOW#:	Other:		
Site:		Special Instructions/Note:		

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform: MS/MSD (Yes or No)	8151A18151A_AP (MOD) Pentachlorophenol	Total Number of containers	Special Instructions/Note:
W-161010-PS-25 (240-70705-1)	10/10/16	11:40 Eastern		Water		X		1	WI Use 200 ul spike, and x4 dilution
W-161010-PS-26 (240-70705-2)	10/10/16	12:15 Eastern		Water		X		1	WI Use 200 ul spike, and x4 dilution
W-161010-PS-27 (240-70705-3)	10/10/16	12:45 Eastern		Water		X		1	WI Use 200 ul spike, and x4 dilution
W-161010-PS-28 (240-70705-4)	10/10/16	13:10 Eastern		Water		X		1	WI Use 200 ul spike, and x4 dilution
W-161010-PS-29 (240-70705-5)	10/10/16	13:40 Eastern		Water		X		1	WI Use 200 ul spike, and x4 dilution
W-161010-PS-30 (240-70705-6)	10/10/16	14:05 Eastern		Water		X		1	WI Use 200 ul spike, and x4 dilution
W-161010-PS-31 (240-70705-7)	10/10/16	14:40 Eastern		Water		X		1	WI Use 200 ul spike, and x4 dilution
W-161010-PS-32 (240-70705-8)	10/10/16	15:00 Eastern		Water		X		3	WI Use 200 ul spike, and x4 dilution
W-161010-PS-32 (240-70705-8MS)	10/10/16	15:00 Eastern	MS	Water		X		1	WI Use 200 ul spike, and x4 dilution
W-161010-PS-32 (240-70705-8MSD)	10/10/16	15:00 Eastern	MSD	Water		X		1	WI Use 200 ul spike, and x4 dilution

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements:
Primary Deliverable Rank: 2	

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by: <i>Rick R.</i>	Date/Time: <i>10-12-2016</i>	Company:	Received by: <i>Thomas Long</i>
	Date/Time:	Company:	Date/Time: <i>10/13/16 9:00</i>
	Date/Time:	Company:	Date/Time:
	Date/Time:	Company:	Date/Time:
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:	

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10/21/2016



Login Sample Receipt Checklist

Client: GHD Services Inc.

Job Number: 240-70705-1

Login Number: 70705
List Number: 2
Creator: Say, Thomas C

List Source: TestAmerica Pittsburgh
List Creation: 10/13/16 02:00 PM

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



Login Sample Receipt Checklist

Client: GHD Services Inc.

Job Number: 240-70705-1

Login Number: 70705
List Number: 3
Creator: Say, Thomas C

List Source: TestAmerica Pittsburgh
List Creation: 10/13/16 07:44 PM

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





Memorandum

December 20, 2016

To: Tim Ree, GHD Ref. No.: 086165-03-12

From: Grant Anderson/sb/4 Tel: 651-639-0913

CC: Tim Braun, GHD

**Subject: Analytical Results and Reduced Validation
Residential Water Sampling Event
Penta Wood Site
Siren, Wisconsin
October 2016**

1. Introduction

This document details a reduced validation of analytical results for residential water samples collected at the Penta Wood Site during October 2016. Samples were submitted to TestAmerica Laboratories, Inc. (TA) located in North Canton, Ohio. BTEX and naphthalene analyses were performed at TA's North Canton laboratory. Pentachlorophenol analyses were performed at TA's Pittsburgh, Pennsylvania laboratory. A sample collection and analysis summary is presented in Table 1. The validated analytical results are summarized in Table 2. A summary of the analytical methodology is presented in Table 3.

Standard GHD Services, Inc. (GHD) report deliverables were submitted by the laboratory. The final results and supporting quality assurance/quality control (QA/QC) data were assessed. Evaluation of the data was based on information obtained from the chain of custody forms, finished report forms, method blank data, recovery data from surrogate spikes, laboratory control samples (LCS), matrix spikes (MS), and field QC samples.

The QA/QC criteria by which these data have been assessed are outlined in the analytical methods referenced in Table 3 and applicable guidance from the documents entitled:

- i) "Quality Assurance Project Plan, Long Term Response Action, Rev. II, February 2005 with addendums
- ii) "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", USEPA 540/R-99/008, October 1999

Item ii) will subsequently be referred to as the "Guidelines" in this Memorandum.



2. Sample Holding Time and Preservation

The sample holding time criteria for the analyses are summarized in Table 3. The sample chain of custody documents and analytical report were used to determine sample holding times. All samples were prepared and analyzed within the required holding times.

All samples were properly preserved, delivered on ice, and stored by the laboratory at the required temperature (0-6°C).

3. Laboratory Method Blank Analyses

Method blanks are prepared from a purified matrix and analyzed with investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures.

Laboratory method blanks were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

All method blank results were non-detect; indicating that laboratory contamination was not a factor for this investigation.

4. Surrogate Spike Recoveries

In accordance with the methods employed, all samples, blanks, and QC samples analyzed for organics are spiked with surrogate compounds prior to sample extraction and/or analysis. Surrogate recoveries provide a means to evaluate the effects of laboratory performance on individual sample matrices.

All samples submitted for BTEX, naphthalene, and pentachlorophenol analyses were spiked with the appropriate number of surrogate compounds prior to sample extraction or analysis.

Each individual surrogate compound is expected to meet the laboratory control limits.

Surrogate recoveries were assessed against laboratory control limits. All surrogate recoveries met the above criteria.

5. Laboratory Control Sample Analyses

LCS are prepared and analyzed as samples to assess the analytical efficiencies of the methods employed, independent of sample matrix effects.

LCS were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

The LCS contained all compounds of interest. All LCS recoveries were within the laboratory control limits, demonstrating acceptable analytical accuracy.



6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

To evaluate the effects of the sample preparation process, measurement procedures, and accuracy of a particular analysis, samples are spiked with a known concentration of the analyte of concern and analyzed as MS/MSD samples. The RPD between the MS and MSD is used to assess analytical precision. If the original sample concentration is significantly greater than the spike concentration, the recovery is not assessed.

MS/MSD analyses were performed as specified in Table 1.

The MS/MSD samples were spiked with all compounds of interest. All percent recoveries and RPD values were within the laboratory control limits.

7. Field QA/QC Samples

The field QA/QC consisted of one trip blank sample, one field blank sample and one field duplicate sample set.

Trip Blank Sample Analysis

To evaluate contamination from sample collection, transportation, storage, and analytical activities, a trip blank sample was submitted to the laboratory for BTEX analysis. All results were non-detect for the compounds of interest.

Field Blank Sample Analysis

To assess ambient conditions at the site and cleanliness of sample containers, a field blank was submitted for analysis, as identified in Table 1. All results were non-detect for the compounds of interest.

Field Duplicate Sample Analysis

To assess the analytical and sampling protocol precision, a field duplicate sample set was collected and submitted "blind" to the laboratory, as specified in Table 1. The RPDs associated with the duplicate samples must be less than 50 percent. If the reported concentration in either the investigative sample or its duplicate is less than five times the reporting limit (RL), the evaluation criteria is one times the RL value.

All field duplicate results were within acceptable agreement, demonstrating acceptable sampling and analytical precision.

8. Analyte Reporting

The laboratory reported detected results down to the laboratory's method detection limit (MDL) for each analyte. Positive analyte detections less than the RL but greater than the MDL were qualified as estimated (J) in Table 2 unless qualified otherwise in this memorandum. Non-detect results were presented as non-detect at the MDL in Table 2.



9. Conclusion

Based on the assessment detailed in the foregoing, the data summarized in Table 2 are acceptable without qualification.

Table 1

**Sample Collection and Analysis Summary
Residential Water Sampling Event
Penta Wood Site
Siren, Wisconsin
October 2016**

Sample Identification	Location	Matrix	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Analysis/Parameters			Comments
					BTEX	Naphthalene	Pentachlorophenol	
W-161010-PS-25	RW05	water	10/10/2016	11:40:00	X	X	X	
W-161010-PS-26	RW01	water	10/10/2016	12:15:00	X	X	X	
W-161010-PS-27	RW02	water	10/10/2016	12:45:00	X	X	X	
W-161010-PS-28	RW04	water	10/10/2016	13:10:00	X	X	X	
W-161010-PS-29	RW03	water	10/10/2016	13:40:00	X	X	X	
W-161010-PS-30	RW06	water	10/10/2016	14:05:00	X	X	X	
W-161010-PS-31	DW01	water	10/10/2016	14:40:00	X	X	X	field blank
W-161010-PS-32	DW01	water	10/10/2016	15:00:00	X	X	X	MS/MSD
W-161010-PS-33	DW01	water	10/10/2016	15:10:00	X	X	X	duplicate (PS-32)
Trip Blank 001	Lab	water	10/11/2016	14:00:00	X			trip blank

Notes:

MS/MSD - Matrix spike/matrix spike duplicate

BTEX - Benzene, toluene, ethylbenzene, and xylenes (total)

**Validated Analytical Results Summary
Residential Water Sampling Event
Penta Wood Site
Siren, Wisconsin
October 2016**

Location ID:	RW05	RW01	RW02	RW04	RW03	RW06	DW01	DW01	DW01	Lab
Sample Name:	W-161010-PS-25	W-161010-PS-26	W-161010-PS-27	W-161010-PS-28	W-161010-PS-29	W-161010-PS-30	W-161010-PS-31	W-161010-PS-32	W-161010-PS-33	Trip Blank 001
Sample Date:	10/10/2016	10/10/2016	10/10/2016	10/10/2016	10/10/2016	10/10/2016	10/10/2016	10/10/2016	10/10/2016	10/11/2016
							field blank		duplicate	trip blank

Parameters	Unit									
Volatile Organic Compounds (BTEX)										
Benzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Ethylbenzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Semivolatile Organic Compounds										
Naphthalene	µg/L	0.19 U	0.19 U	0.20 U	0.19 U	0.20 U	0.19 U	0.19 U	0.20 U	0.20 U
Herbicides										
Pentachlorophenol	µg/L	0.095 U	0.020 J	0.097 U	0.094 U	0.095 U	0.095 U	0.095 U	0.025 J	0.024 J

Notes:

U - Not detected at the associated reporting limit

J - Estimated concentration

Table 3

**Analytical Methods and Holding Time Criteria
Residential Water Sampling Event
Penta Wood Site
Siren, Wisconsin
October 2016**

Parameter	Method	Matrix	Holding Time	
			Collection to Extraction (Days)	Collection or Extraction to Analysis (Days)
BTEX	SW 8260B	Water	-	14
Naphthalene	SW 8270C	Water	7	40
Pentachlorophenol	SW 8151	Water	7	40

Notes:

Method References:

SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, 1986, with subsequent revisions

Appendix D

Site Inspection Forms

Well Inspection Form
Penta Wood Products Superfund Site
Siren, Wisconsin

086165

	Protective Casing	Lock & Cover	J-Plug	Well Casing	Ground Surface	Notes
Monitoring Wells						
MW1						ALL GOOD
MW2						↓
MW3						
MW4						
MW5						
MW6						
MW6S						
MW7						
MW8						
MW9						
MW10						
MW10S						
MW11						
MW12						
MW13						
MW14						
MW15						
MW16						
MW17						
MW18						
MW19						
MW20						
MW21						
MW22						
MW23						
MW24						
MW25						
MW26						
MW27						
MW28						
MW29						
MW30						
MW31						↓

	Vault & Cover	Well Casings	Ground Surface	Notes	
Extraction Wells					
EW2	Good				
EW3	↓	↓			
EW4	↓	↓			
EW5	↓	↓		water in vault	
EW6	↓	↓			
EW7	↓	↓		water in vault	
EW10	↓	↓			
EW12	↓	↓		water in vault	
EW13	↓	↓			
EW14	↓	↓		↓	
				EW11 water in vault	
	Protective Casing	Lock & Cover	Ground Surface	Inner Casing/Tubing	Notes

	Protective Casing	Lock & Cover	Ground Surface	Inner Casing/Tubing	Notes
Gas Probes					
SG-04DIS					ALL GOOD
SG-05DIS					↓
SG-06DIS					
SG-07DIS					
SG-22					
SG-23					
SG-24					
SG-25					
SG-26					
Inspected By:	[Signature]				
Date:	10-7-16				
Additional Notes:					

Continuing Obligations Inspection Form
Penta Wood Products Superfund Site
Siren, Wisconsin

086165

Verified

Notes

Verify Site Conditions

- CAMU area fence condition is satisfactory
- CAMU signage is present/visible at all fence gates
- CAMU surface soil condition is satisfactory and does not require erosion/settlement repairs
- Perimeter area fence is satisfactory and does not require repairs
- Perimeter signage is present/visible
- Site access is limited and all perimeter fence locks in working order
- NaOH tank condition is satisfactory with no signs of leaks
- FeSO4 tank condition is satisfactory with no signs of leaks

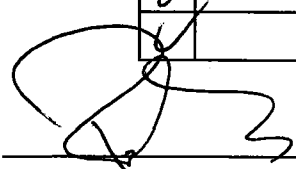
✓	
✓	
✓	
✓	
✓	
✓	
✓	
✓	

Verify situations have not and are not occurring

- Removal of the existing barrier or cover
- Replacement with another barrier or cover
- Excavating or grading of the land surface
- Filling on covered or paved areas
- Plowing for agricultural cultivation
- Construction or placement of a building or other structure
- Change in use or occupancy of the property

✓	
✓	
✓	
✓	Minor washout of driveway
✓	
✓	
✓	

Inspected By: _____



Date: _____

10-7-16

www.ghd.com

