January 14, 2021 Project No. 19119232

Ms. Maureen Hatfield
MC-127
VCP-CA Section, Team 1, Remediation Division
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

SUBJECT: **CORRECTIVE ACTION MONITORING REPORT: 2020 SECOND SEMI-ANNUAL EVENT**
UNION PACIFIC RAILROAD HOUSTON WOOD PRESERVING WORKS, HOUSTON, TEXAS
4910 LIBERTY ROAD, HOUSTON, HARRIS COUNTY, TEXAS
TCEQ SWR NO. 31547; TCEQ PERMIT/COMPLIANCE PLAN NO. 50343
EPA ID NO. TXD000820266
CUSTOMER NO. CN600131098; REGULATED ENTITY NO. RN100674613

Dear Ms. Hatfield:

Golder Associates Inc (Golder), on behalf of Union Pacific Railroad Company (UPRR), is pleased to provide the Corrective Action Monitoring Report: 2020 Second Semi-Annual Event for above referenced site for your review. The report was prepared in accordance with Section VII.C.2 of Compliance Plan No. CP-50343, which was issued in conjunction with Post-Closure Care Permit No. HW-50343, both dated June 10, 2005. In addition to the original copy of the report, an electronic version of the report is also attached for your files.

If you have any questions or need additional information, please feel free to call me at (512) 671-3434 or email eric_matzner@golder.com; or Mr. Kevin Peterburs of UPRR at (414) 267-4164 and email kjpeterb@up.com.

Sincerely

Golder Associates Inc.

Eric C. Matzner, P.G.
Principal

CC: Waste Program Manager, TCEQ Region 12, Houston
Mr. Kevin Peterburs, UPRR – Milwaukee, WI

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CORRECTIVE ACTION MONITORING REPORT

2020 Second Semi-Annual Event

Former Houston Wood Preserving Works

4910 Liberty Road Houston, Texas

Submitted to:

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Union Pacific Railroad Company
4823 N 119th Street
Milwaukee, WI 53225

Submitted by:

Golder Associates Inc.
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Project No. 19119232

January 11, 2021

Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

1/8/2021 _____

Signature Date

Mark Lutz

Name

AVP Fuel & Environmental

Title

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1.0 EXECUTIVE SUMMARY

This semi-annual report presents a summary and evaluation of the Corrective Action Groundwater Monitoring for July through December 2020 for the Closed Surface Impoundment (Solid Waste Management Unit (SWMU) 1) at the former Wood Preserving Works facility (the Site) located in Houston, Texas. The groundwater monitoring activities for this period were performed by Golder Associates Inc. (Golder) on behalf of Union Pacific Railroad (UPRR) in July 2020.

The two uppermost groundwater bearing units, the A-Transmissive Zone (A-TZ) and the B-Transmissive Zone (B-TZ), were monitored during this period. Groundwater elevation data collected during the July 2020 sampling event show A-TZ groundwater generally flows to the west across SWMU 1 with a hydraulic gradient of approximately 0.003 ft/ft. Groundwater flow during the previous event (2020 first semi-annual monitoring event) in the A-TZ was observed to have a hydraulic gradient with a general flow direction of southwest across SWMU 1.

Groundwater elevation data collected in the B-TZ show groundwater flow to the west across SWMU 1 with a hydraulic gradient of approximately 0.004 ft/ft. Groundwater flow during the previous event (2020 first semi-annual monitoring event) was observed to have a hydraulic gradient of approximately 0.004 ft/ft with a general flow direction to the west and south/southeast across SWMU 1.

Analytical results from the 2nd semi-annual sampling event of 2020 were compared to Texas Commission on Environmental Quality (TCEQ) Texas Risk Reduction Program (TRRP) Protective Concentration Limits (PCLs) or Groundwater Protection Standards (GWPs), as designated in Section IV.D of the Compliance Plan, dated June 10, 2005. Constituent concentrations were below their respective PCLs during the 2020 second semi-annual monitoring period. All POC monitoring wells in the A-TZ and B-TZ are considered to be compliant for this monitoring period.

2.0 INTRODUCTION

This semi-annual report presents a summary and evaluation of groundwater monitoring data collected during the 2020 second semi-annual monitoring period (July through December) at the Union Pacific Railroad (UPRR) former Houston Wood Preserving Works facility (the Site) located at 4910 Liberty Road in Houston, Texas (Figure 1). Semi-annual groundwater monitoring is required for the Site as a condition of the Texas Commission on Environmental Quality (TCEQ) Hazardous Waste Permit No. 50343 and associated Compliance Plan (CP) No. 50343, both renewed and issued on June 10, 2005. Groundwater monitoring at the Site is performed to monitor groundwater quality beneath the Closed Surface Impoundment Unit No. 001 (Solid Waste Management Unit (SWMU) 1).

On behalf of UPRR, Golder Associates Inc. (Golder) conducted groundwater monitoring activities at SWMU 1 on July 8, 2020 (water level measurements) and July 14-15, 2020 (groundwater sampling). Groundwater monitoring activities included sampling and gauging the background and point of compliance (POC) wells and piezometers associated with SWMU 1. The sampling event, analytical data, and data evaluation provided in this report fulfill the semi-annual corrective action reporting requirements for the second half of 2020 as described in the CP, Section VII.C.2. This section requires the following reporting elements:

Semi-Annual Corrective Action Report Requirements	Report Section, Table(s) and/or Figure(s)
A narrative summary of the evaluations made in accordance with CP Sections V, VI, and VII for the preceding six-month period. These periods shall be January 1 through June 30 and July 1 through December 31 (VII.C.2.a.)	3.0
Summary of Methods utilized for management of recovered/purged water (VII.C.2.b.)	3.2
An updated table and map of the monitoring and corrective action system wells (VII.C.2.c.)	Section 3.1.1 and Figure 2
The results of the chemical analyses, submitted in a tabulated format in a form acceptable to the Executive Director, which clearly indicates each parameter that exceeds the Groundwater Protection Standard (GWPS). Copies of the original laboratory report for chemical analyses showing detection limits and quality control and quality assurance data shall be provided if requested by the Executive Director (VII.C.2.d.)	Tables 1 & 2 Appendix C
Tabulation of the water level elevations (relative to mean sea level), depth to water measurements, and total depth of well measurements collected since the data that was submitted in the previous semiannual report (VII.C.2.e.)	Table 4
Potentiometric surface maps showing the elevation of the water table at the time of sampling and direction of groundwater flow gradients (VII.C.2.f.)	Figures 3 & 4

Semi-Annual Corrective Action Report Requirements (cont'd)	Report Section, Table(s) and/or Figure(s)
Quarterly tabulations of quantities of recovered groundwater and NAPLs, and graphs of monthly recorded flow rates versus time for the recovery wells during each period. A narrative summary describing and evaluating the NAPL recovery program shall also be included (VII.C.2.h.)	Not Applicable
Tabulation of the total contaminant mass recovered from each recovery system for each reporting period, if such a system is installed (VII.C.2.i.)	Not Applicable
Tabulation of the data evaluation results pursuant to Section VI.D and status of each well listed on CP Table V with regard to compliance with the corrective action objectives and compliance with the GWPSs (VII.C.2.j.)	Table 5
Maps of the contaminated area depicting concentrations of constituents listed in Table IV and any newly detected Table III constituents as isopleths contours or discrete concentrations if isopleths contours cannot be inferred (VII.C.2.k.)	Not Applicable
Maps indicating the extent and thickness of the LNAPLs and DNAPLs, if detected (VII.C.2.l.)	Not Detected
An updated schedule summary as required by Section X (VII.C.2.m.)	Appendix D
Summary of any changes made to the monitoring/corrective action program and a summary of recovery well inspections, repairs, and any operational difficulties (VII.C.2.n.)	None
A table of the modifications and amendments made to this Compliance Plan with their corresponding approval dates by the executive director or the Commission and a brief description of each action (VII.C.2.o.)	None
Corrective Measures Implementation (CMI) Report to be submitted in accordance with Section VIII.F, if necessary (VII.C.2.p.)	Not Applicable
Tabulation of well casing elevations in accordance with Attachment B No. 16 (VII.C.2.q.)	Table 4
Recommendation for any changes (VII.C.2.r.)	None
Certification and well installation diagram for any new well installation or replacement and certification for any well plugging and abandonment (VII.C.2.s.)	Not Applicable
A summary of any activity within an area subject to institutional control (VII.C.2.t.)	None
Any other items requested by the Executive Director (VII.C.2.u.)	None

As of January 2021, a recovery system had not been installed and is not necessary for the regulated unit. Therefore, Provisions 8, 9, and 10 that relate to recovery wells or recovery system, are not applicable for this reporting period.

Responses to each of the semi-annual report provisions required by CP Section VII.C.2 are provided in Section 3.0.

3.0 2020 SECOND SEMI-ANNUAL GROUNDWATER MONITORING EVENT

A discussion of each of the semi-annual report provisions required by CP Section VII.C.2 is presented below by reference number to the list of provisions in Section 2.0.

3.1 Narrative Summary of Second Semi-Annual Monitoring Activities

The CP requires an evaluation of the Corrective Action Program (Section V) and Groundwater Monitoring Program summarizing the overall effectiveness of the Corrective Action Program (Section VI). This narrative summary includes provisions for response and reporting requirements as detailed in the CP Section VII, as discussed below.

3.1.1 Corrective Action Program

Groundwater samples were collected from the Background and POC wells (as detailed in CP Table V, which is provided in Appendix A) to assess potentially affected groundwater quality in the A-Transmissive Zone (A-TZ) and the B-Transmissive Zone (B-TZ). These water-bearing zones are defined as:

- A-TZ refers to the first sand unit encountered at approximately 13 feet below ground surface (bgs) and averages 7 feet in thickness; and
- B-TZ refers to the second sand unit encountered at approximately 30 feet bgs and averages 9 feet in thickness.

The definitions of the A-TZ and B-TZ are consistent with the Uppermost Transmissive Zone (UTZ) and Second Transmissive Zone (STZ), respectively, as defined in CP Provision I.A.

The following monitoring wells were sampled during this event (Figure 2):

- A-TZ POC wells: MW-01A, MW-02, MW-07, MW-10A, and MW-11A;
- A-TZ Background well: MW-08;
- B-TZ POC wells: MW-10B, MW-11B, and P-10; and
- B-TZ Background well: P-12.

3.1.2 Groundwater Monitoring

Golder performed quarterly inspections of SWMU 1 in July and October 2020 and conducted semi-annual groundwater sampling activities on July 14-15, 2020. Groundwater sampling was performed using procedures outlined in a U.S. Environmental Protection Agency (EPA) document titled Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures (EPA/540/S-95/504) published in April 1996 and approved in the CP application. Groundwater samples were analyzed for the Detected Hazardous and Solid Waste Constituents listed in the CP, Table III (Appendix A).

Monitoring wells are equipped with dedicated polytetrafluoroethylene (PTFE) tubing for groundwater sampling. A peristaltic pump was used to purge and collect the groundwater samples. An approximate one-foot section of disposable silicon tubing was placed around the pump head and attached to the PTFE tubing for proper operation of the pump. Groundwater was pumped from the screened interval of each well at a flow rate of less than 0.5 L/min using a flow-through cell. Field parameters including temperature, pH, specific conductivity, dissolved oxygen, and turbidity were measured during purging and sampling activities. When field parameters had

stabilized to the EPA-specified criteria, a sample was then collected for analysis. The samples were also collected at a flow rate of less than 0.5 L/min. Recorded field parameters are summarized in Appendix B.

For each well, sample bottles were filled directly from the pumping apparatus described above, and were sealed and packed in coolers with sufficient ice to maintain a sample temperature of approximately 4°C. The sample coolers were delivered to ALS Environmental in Houston, Texas for laboratory analysis. Chain-of-Custody (COC) forms were completed and kept with their respective samples. Copies of the analytical data and COCs are included in Appendix C. Groundwater samples were then analyzed for the Detected Hazardous and Solid Waste Constituents listed in the CP, Table III (Appendix A).

3.2 Purge Water Management

Approximately 13 gallons of purge water were generated during the July 2020 low-flow groundwater sampling event. The purge water was containerized in a Department of Transportation (DOT) certified, 55-gallon steel drum and temporarily stored on site in a fenced and locked container storage area (NOR 007). Wastes generated during the second semi-annual monitoring event in 2020 were transported from the Site by NRC/US Ecology to the US Ecology Robstown facility, located in Robstown, Texas on August 7, 2020 under EPA waste code F034 and TCEQ Notice of Registration (NOR) waste code 0914101H. The waste manifest is provided in Appendix D.

3.3 Monitoring and Corrective Action System Wells

A summary of the current monitoring and corrective action groundwater wells is discussed in Section 3.1.1. Configuration of the current monitoring and corrective action well network is presented on Figure 2.

3.4 Analytical Results

The 2020 second semi-annual groundwater analytical results from the A-TZ and B-TZ are summarized in Tables 1 and 2, respectively and the laboratory analytical report is provided in Appendix C. The analytical results were compared to the Detected Hazardous and Solid Waste Constituent limits, which are taken from the current TCEQ Texas Risk Reduction Program (TRRP) Tier 1 Protective Concentration Levels (PCLs). TRRP PCLs serve as the Groundwater Protection Standard (GWPS), as detailed in Section IV.D and Table III of the CP. If concentrations exceeded the concentration limits of this report, the concentration is bolded within the table.

Quality assurance/quality control (QA/QC) samples (matrix spike and matrix spike duplicate results) are summarized in Table 3.

3.5 Well Measurements

During the sampling event, the following information was recorded at each monitoring well:

Before Sampling:

- The presence of light NAPLs was evaluated; and
- Depth to groundwater below the top of casing was measured to the nearest 0.01 foot.

After Sampling:

- The presence of dense non-aqueous phase liquids (DNAPLs) was evaluated using visual observations and an oil-water interface probe; and
- Total well depths of the wells were measured.

Table 4 provides a summary of these measurements. None of the compliance wells had measurable amounts or any indication of LNAPL or DNAPL.

3.6 Potentiometric Surface Maps

Groundwater elevation data recorded during the 2020 second semi-annual monitoring event were used to create potentiometric surface maps of the A-TZ and B-TZ, presented on Figures 3 and 4, respectively.

The two uppermost groundwater bearing units, the A-TZ and the B-TZ, were monitored during this period. Based on groundwater elevation data collected in the A-TZ during the July 2020 gauging event, groundwater flows to the west across SWMU 1 with a hydraulic gradient of approximately 0.003 ft/ft. Groundwater flow during the previous event (2020 first semi-annual monitoring event) in the A-TZ was observed to have a hydraulic gradient of 0.01 ft/ft with a general flow direction of southwest across SWMU 1.

Groundwater elevation data collected in the B-TZ show groundwater flow to the west across SWMU 1 with a hydraulic gradient of approximately 0.004 ft/ft. Groundwater flow during the previous event (2020 first semi-annual monitoring event) was observed to have a similar hydraulic gradient with a general flow direction to the west/southwest across SWMU 1.

3.7 Non-Aqueous Phase Liquids

Measurable amounts of LNAPL and/or DNAPL were not observed in any of the compliance wells.

3.8 Recovered Groundwater and NAPL

To date, a recovery system has not been installed nor is necessary at the SWMU 1; therefore, this provision is not applicable.

3.9 Contaminant Mass Recovered

With no groundwater recovery system installed, or necessary, this provision is not applicable for the Site.

3.10 Analytical Data Evaluation

Section VI.D of the CP describes two methods which may be used to determine the compliance status of a given well:

- Analytical results may be either directly compared with PCLs (CP Table III; included in Appendix A), or
- Analytical results can be statistically compared with PCLs using the Confidence Interval Procedure for the mean concentration based on normal, log-normal, or non-parametric distribution, which the 95% confidence coefficient of the t-distribution will be used in construction of the confidence interval.

Direct comparison to PCLs was used to evaluate the analytical data. Tables 1 (A-TZ) and 2 (B-TZ) show the results of a direct comparison of data for this sampling event to the respective PCLs. Wells and piezometers are in compliance if each of the constituents listed in the CP Table III was reported at a concentration less than or equal to the PCL. Based on the analytical results from the July 2020 monitoring event, the compliance wells completed in both transmissive zones are compliant with GWPSs. Compliance status for each of the monitoring wells is provided in Table 5.

Concentration versus time graphs for COCs in the A-TZ (2-methylnaphthalene (Figure E-1), dibenzofuran (Figure E-2), and naphthalene (Figure E-3)) and the B-TZ (dibenzofuran (Figure E-4) and naphthalene (Figure E-5)) are

provided in Appendix E. The graphs demonstrate that COC concentrations in the A-TZ and B-TZ POC wells have shown a steady decrease over time with sporadic detections.

A QA/QC review and Data Usability Summary (DUS) were prepared for the July 2020 analytical data by GHD Services Inc. (Appendix C). The laboratory qualified analytes with concentrations above the sample detection limits (SDLs) but below the method quantitation limits (MQLs) as estimated on analytical tables (Tables 1 and 2).

3.11 Reported Concentration Maps

Reported concentrations of each constituent analyzed for the 2020 first semi-annual monitoring event are presented on Figures 5 and 6 for the A-TZ and B-TZ compliance wells, respectively. In the event a constituent exceeded their respective PCL, the value would be highlighted on the figures. Concentrations in all wells were below PCLs.

3.12 Extent of NAPL

No measurable amounts of LNAPL or DNAPL were detected in any of the compliance wells.

3.13 Updated Compliance Schedule

Section X of the CP requires that the Permittee submit a schedule summarizing the activities required by the Compliance Plan issued on June 10, 2005, which was originally submitted to the TCEQ on August 4, 2004. An updated compliance schedule is included as Appendix F of this report.

3.14 Summary of Changes Made to Corrective Action Program

No changes have been made to the corrective action program.

3.15 Modifications and Amendments to Compliance Plan

A compliance plan renewal application was submitted to TCEQ on December 23, 2003 consistent with the renewal requirements for the RCRA permit at the site. The RCRA permit and CP were issued June 10, 2005. There have been no modifications or amendments to the Compliance Plan since the last permit issued. However, a RCRA Part A and Part B Permit Renewal Application with a Major Modification to the Compliance Plan was submitted on December 10, 2014, with revisions dated December 7, 2015, July 29, 2016, June 24, 2017, July 9, 2019, August 31, 2020, and October 26, 2020. The Permit Renewal Application is currently under TCEQ review. A Class 1 Permit Modification to update the facility contact information was submitted on February 28, 2018 and approved by the TCEQ in a letter dated March 20, 2018.

Naphthalene concentrations in POC well MW-11B exceeded the GWPS during the 2nd semiannual monitoring event in 2019. An evaluation of MW-11B data was provided in the Interim Groundwater Monitoring Report (2019-2020) dated April 30, 2020 as requested by the TCEQ in a letter dated March 18, 2020. As part of the current monitoring period, constituent concentrations including naphthalene were below GWPS in the SWMU 1 wells during the 1st and 2nd semi-annual monitoring events in 2020. As detailed in a response letter to TCEQ dated August 5, 2020, SWMU 1 will remain in the Corrective Action Program until concentrations in POC wells are below GWPS for three consecutive years in accordance with Section IV.F.3 of the CP. Once the compliance monitoring objectives are met, UPRR will propose to switch to the compliance monitoring program.

3.16 Corrective Measures Implementation (CMI) Report

A Response Action Plan (RAP) was submitted with the Compliance Plan to the TCEQ on December 10, 2014 with revisions dated December 7, 2015, July 29, 2016, June 24, 2017, July 9, 2019, August 31, 2020, and October 26, 2020.

3.17 Well Casing Elevations

In accordance with the facility Groundwater Sampling and Analysis Plan (GWSAP) dated May 13, 2004 (Revision 1), which requires SWMU 1 monitoring well elevations to be resurveyed every five years, the six A-TZ and four B-TZ monitoring well elevations were surveyed on December 23, 2015. The top of casing elevations for the 2020 second semi-annual event in Table 4 are based on the December 2015 survey. The SWMU 1 monitoring well elevations were resurveyed in December 2020, and the report for the resurveyed well casing elevations will be submitted to the TCEQ under a separate cover letter.

3.18 Recommendation for Changes

As detailed in a response letter to TCEQ dated August 5, 2020, SWMU 1 will remain in the Corrective Action Program until concentrations in POC wells are below GWPS for three consecutive years in accordance with Section IV.F.3 of the CP. Once the compliance monitoring objectives are met, UPRR will propose to switch to the compliance monitoring program.

3.19 Well Installation and/or Abandonment

No monitoring wells were installed or abandoned as part of the monitoring program or the Corrective Action Program during the reporting period.

3.20 Activity Within Area Subject to Institutional Control

No areas are under institutional control; therefore, this provision does not apply.

3.21 Other Requested Items

No other items have been requested by the executive director.

TABLES

Table 1
Summary of Analytical Results for the A-Transmissive Zone (A-TZ)
Semiannual Monitoring Report: 2020 Second Semi-Annual Event

Houston Wood Preserving Works
Houston, Texas

Analyte	PCL (mg/L)	Monitoring Well IDs (Concentrations mg/L)																				
		MW-01A			FD-01			MW-02			MW-07			MW-08			MW-10A			MW-11A		
		7/14/2020	LQ	VQ	7/14/2020	LQ	VQ	7/14/2020	LQ	VQ	7/14/2020	LQ	VQ	7/14/2020	LQ	VQ	7/14/2020	LQ	VQ	7/14/2020	LQ	VQ
Acenaphthene	1.5	0.049			0.044			0.0055			0.000027	U	U	0.000027	U	U	0.000027	U	U	0.000027	U	U
Acenaphthylene	1.5	0.00071			0.00081			0.000015	U	U	0.000015	U	U	0.000015	U	U	0.000015	U	U	0.000015	U	U
Anthracene	7.3	0.0016			0.0016			0.00014			0.000014	U	U	0.000014	U	U	0.000014	U	U	0.000014	U	U
bis(2-ethylhexyl)phthalate	0.006	0.000088	J	J	0.000037	U	U	0.000062	J	J	0.000037	U	U	0.000037	U	U	0.00011	J	J	0.000037	U	U
Dibenzofuran	0.098	0.008			0.009			0.0006			0.00002	U	U	0.00002	U	U	0.00002	U	U	0.00002	U	U
Fluoranthene	0.98	0.0031			0.0035			0.00039			0.00001	U	U	0.00001	U	U	0.000018	J	J	0.00001	U	U
Fluorene	0.98	0.02			0.018			0.0033			0.00003	U	U	0.00003	U	U	0.00003	U	U	0.00003	U	U
2-Methylnaphthalene	0.098	0.00091		J	0.0015		J	0.00081			0.000019	U	U	0.000019	U	U	0.000019	U	U	0.000019	U	U
Naphthalene	0.49	0.00049		U J	0.0052		J	0.00015		U	0.00012		U	0.00002	U	U	0.00002	U	U	0.00002	U	U
Phenanthrene	0.73	0.0026			0.0029			0.00032			0.000021	U	U	0.000021	U	U	0.000021	U	U	0.000021	U	U
Pyrene	0.73	0.0014			0.0017			0.00023			0.000019	U	U	0.000019	U	U	0.000019	U	U	0.000019	U	U

Notes:
PCL = Protective Concentration Level
The Compliance Plan Section IV.D defines the Groundwater Protection Standard (GWPS) as the PCL
FD-01 = Duplicate sample collected at MW-01A

LQ - Lab Qualifier
J = Estimated value between the SDL and the MQL
U = Value not detected greater than the MQL

VQ - Validation Qualifier
J = Estimated concentration
U = Non-detect due to low concentrations detected in the associated field blank

Table 2
Summary of Analytical Results for the B-Transmissive Zone (B-TZ)
Semiannual Monitoring Report: 2020 Second Semi-Annual Event

Houston Wood Preserving Works
Houston, Texas

Analyte	PCL (mg/L)	Monitoring Well IDs (Concentrations mg/L)														
		MW-10B			MW-11B			P-10			FD-02			P-12		
		7/14/2020	LQ	VQ	7/14/2020	LQ	VQ	7/14/2020	LQ	VQ	7/14/2020	LQ	VQ	7/15/2020	LQ	VQ
Acenaphthene	1.5	0.029			0.067			0.00018			0.000027	U	U	0.000027	U	U
Acenaphthylene	1.5	0.00028			0.00094			0.000015	U	U	0.000015	U	U	0.000015	U	U
Anthracene	7.3	0.00094			0.0037			0.000014	U	U	0.000014	U	U	0.000014	U	U
bis(2-ethylhexyl)phthalate	0.006	0.00016	J	J	0.000064	J	J	0.0001	J	J	0.000037	U	U	0.000037	U	U
Dibenzofuran	0.098	0.0067			0.024			0.00002	U	U	0.00002	U	U	0.00002	U	U
Di-n-butyl phthalate	2.4	0.000065	J	J	0.00002	U	U	0.000032	J	J	0.000025	J	J	0.00002	U	U
Fluoranthene	0.98	0.0015			0.0045			0.000045	J	J	0.00005	J	J	0.00001	U	U
Fluorene	0.98	0.014			0.035			0.00012			0.00003	U	U	0.00003	U	U
Naphthalene	0.49	0.00066		U	0.3			0.00002	U	U	0.00002	U	U	0.00002	U	U
Phenol	7.3	0.000035	U	U	0.000035	U	U	0.000035	U	U	0.000035	U	U	0.000035	U	U
Pyrene	0.73	0.00069			0.0027			0.000068	J	J	0.00006	J	J	0.000019	U	U

Notes:
PCL = Protective Concentration Level
The Compliance Plan Section IV.D defines the Groundwater Protection Standard (GWPS) as the PCL
FD-02 = Duplicate sample collected at P-10

LQ - Lab Qualifier
J = Estimated value between the SDL and the MDQ
U = Value not detected greater than the MQL

VQ - Validation Qualifier
J = Estimated concentration
U = Non-detect due to low concentrations detected in the associated field blank

Table 3
Summary of Analytical Results for Quality Assurance/Quality Control Samples
Semiannual Monitoring Report: 2020 Second Semi-Annual Event

Houston Wood Preserving Works
Houston, Texas

Analyte	P-12(MS)[1] Matrix Spike		P-12(MSD)[1] Matrix Spike Duplicate	
Acenaphthene	2.947		2.77	
Acenaphthylene	3.282		2.996	
Anthracene	3.665		3.494	
bis(2-ethylhexyl)phthalate	4.59		4.632	
Dibenzofuran	3.246		3.069	
Fluoranthene	4.311		3.867	
Fluorene	3.474		3.3	
2-Methylnaphthalene	3.153		2.824	
Naphthalene	3.07		2.842	
Phenanthrene	3.747		3.506	
Pyrene	3.863		3.964	

Notes:
PCL = Protective Concentration Level
(1) = P-12(MS) and P-12(MSD) are matrix spike and matrix spike duplicate samples collected at P-12, respectively.
N = Relative percent difference of the MS and MSD exceeds the control limits.

Table 4
Water Level Measurements
Semiannual Monitoring Report: 2020 Second Semi-Annual Event

Houston Wood Preserving Works
Houston, Texas

Well ID	Top of Casing Elevation (TOC) (ft MSL)*	Date Measured	Water Depth (ft. BTOC)	Depth to NAPL (ft. BTOC)	Total Well Depth as Completed (ft. BTOC)	Total Well Depth (ft. BTOC)	Potentiometric Elevation (ft. MSL)
A-TZ Monitoring Locations							
MW-01A	47.90	7/8/2020	5.34	ND	20.2	20.00	42.56
MW-02	47.89	7/8/2020	5.79	ND	20.3	21.15	42.10
MW-07	48.91	7/8/2020	6.48	ND	25.9	24.85	42.43
MW-08	49.33	7/8/2020	6.59	ND	26.8	25.10	42.74
MW-10A	49.83	7/8/2020	7.46	ND	25.9	25.60	42.37
MW-11A	50.16	7/8/2020	7.67	ND	24.4	24.00	42.49
B-TZ Monitoring Locations							
MW-10B	49.96	7/8/2020	7.58	ND	48.8	46.55	42.38
MW-11B	50.24	7/8/2020	7.81	ND	46.8	46.80	42.43
P-10	47.71	7/8/2020	5.38	ND	40.0	NA	42.33
P-12	48.76	7/8/2020	5.31	ND	40.0	42.40	43.45

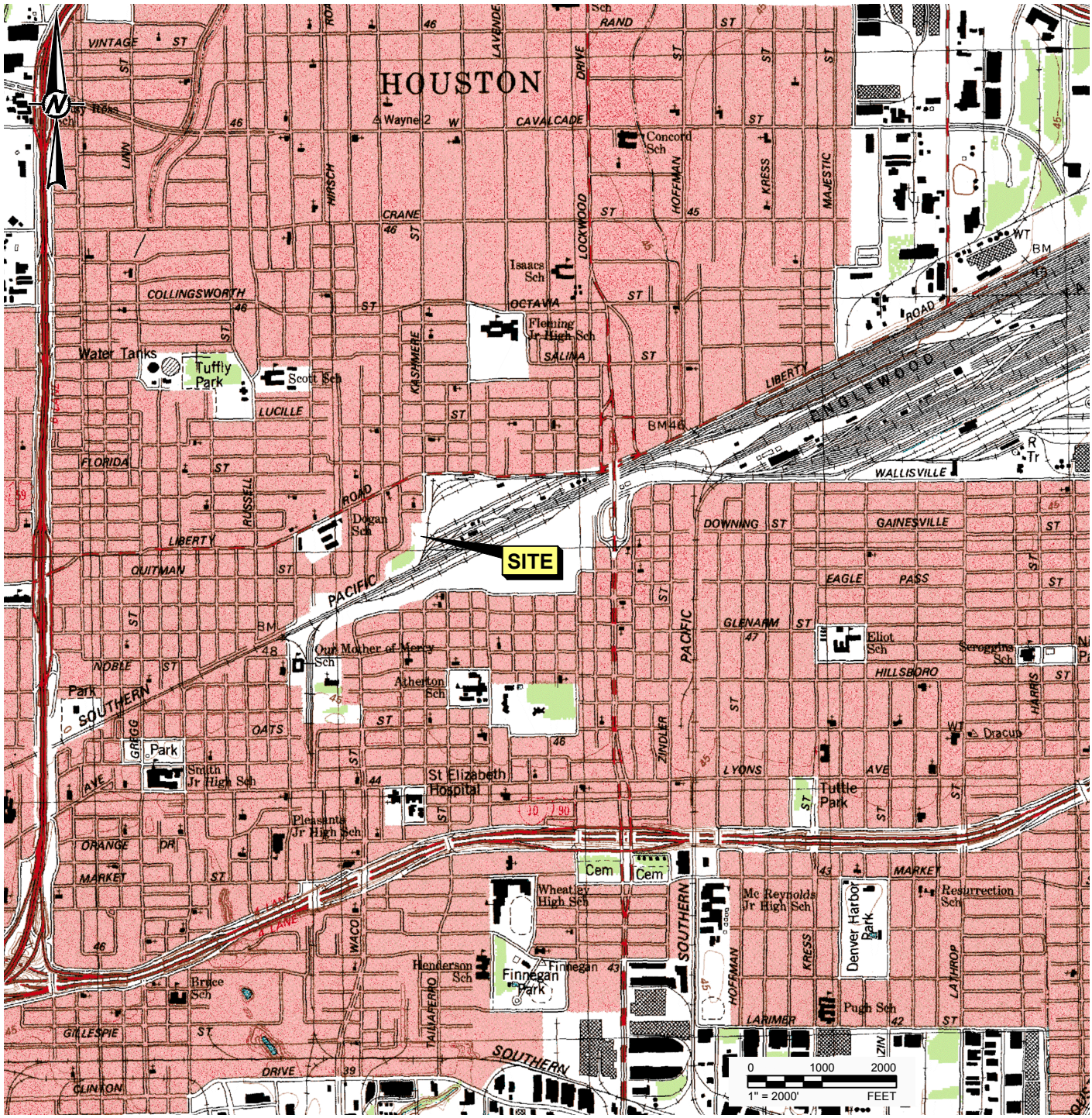
Notes
BTOC = feet below the top of the well casing
ft. MSL = feet above Mean Sea Level
NA = Not Available
*TOC elevations based on December 2015 survey (see Section 3.17)

Table 5
Compliance Status of Wells and Piezometers
Semiannual Monitoring Report: 2020 Second Semi-Annual Event

Houston Wood Preserving Works
Houston, Texas

Zone	Monitoring Well Location	Well Designation	Compliance Status
A-TZ Monitoring Location	MW-01A	Point of Compliance	Compliant
	MW-02	Point of Compliance	Compliant
	MW-07	Point of Compliance	Compliant
	MW-08	Background Well	Compliant
	MW-10A	Point of Compliance	Compliant
	MW-11A	Point of Compliance	Compliant
B-TZ Monitoring Location	MW-10B	Point of Compliance	Compliant
	MW-11B	Point of Compliance	Compliant
	P-10	Point of Compliance	Compliant
	P-12	Background Well	Compliant

FIGURES



REFERENCE(S)

BASE MAP TAKEN FROM USGS 7.5 MINUTE QUADRANGLE, SETTEGAST, TEXAS, 1982.

QUADRANGLE LOCATION

CLIENT

UNION PACIFIC RAILROAD CO.

PROJECT

HOUSTON WOOD PRESERVING WORKS

TITLE

SITE LOCATION MAP

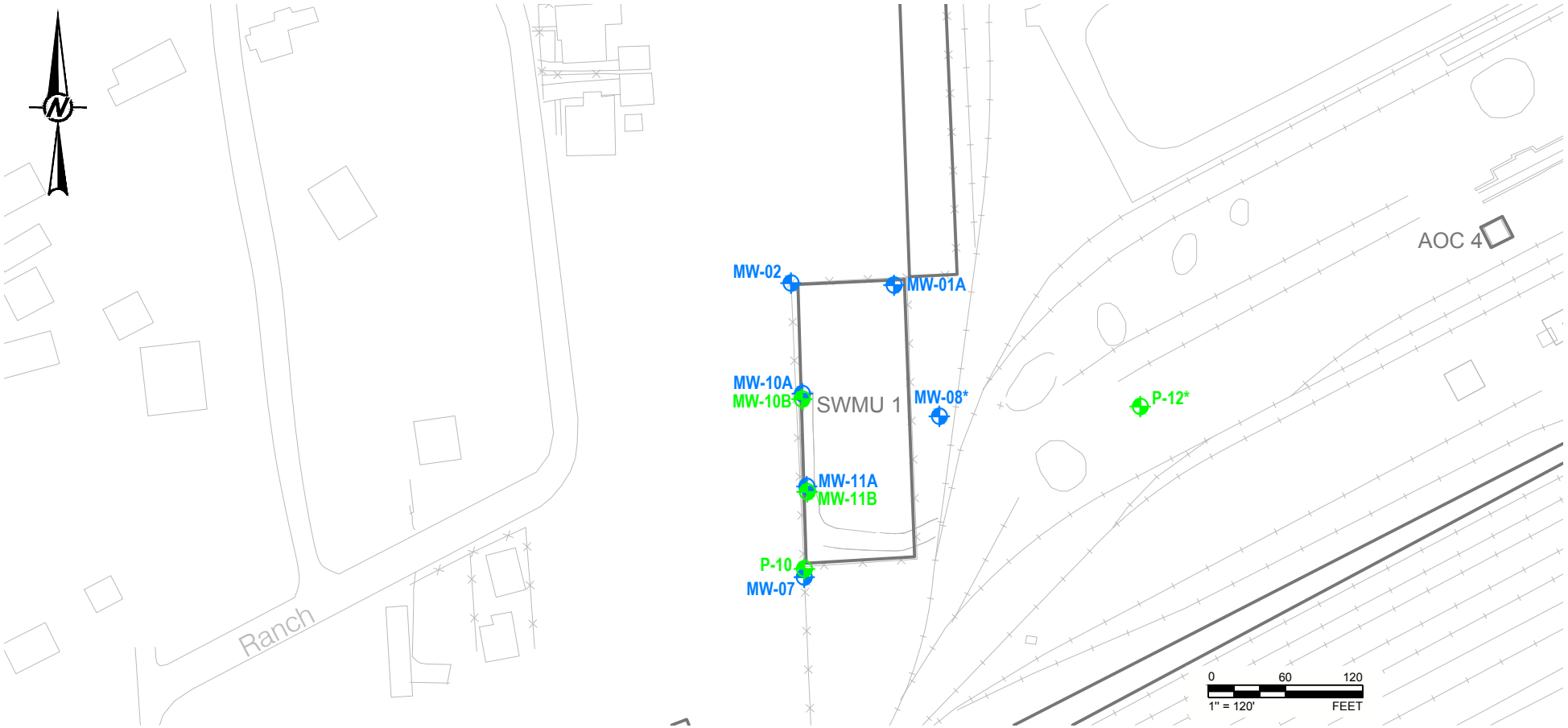
CONSULTANT

GOLDER

YYYY-MM-DD	2018-12-10
DESIGNED	AJD
PREPARED	AJD
REVIEWED	MH
APPROVED	ECM

PROJECT NO. 30401358 | REV. 0 | FIGURE 1

Last Edited By: adiamond Date: 2020-07-06 Time:12:07:03 PM | Printed By: adiamond Date: 2020-07-06 Time:12:08:08 PM |
Path: \\texarkana\data\Projects - Round Rock_2019\19119232 - HWPW\0-Semi-Annual Monitoring Event\SWMU Figures\2020 - 1st Semi-Annual\ | File Name: FIG 2 - Corrective Action Monitoring Well Network TCEQ Permit Unit No.1.dwg



LEGEND

- ROAD, PARKING LOT, SIDEWALK
- FENCE
- RAILROAD
- A-TZ MONITORING WELL LOCATION
- B-TZ MONITORING WELL LOCATION

NOTE(S)

1. * BACKGROUND WELL.

REFERENCE(S)

BASE MAP TAKEN FROM ERM-SOUTHWEST, INC 0014419A310.DWG, 6/19/2006.

CLIENT
UNION PACIFIC RAILROAD CO.

PROJECT
HOUSTON WOOD PRESERVING WORKS

TITLE
CORRECTIVE ACTION MONITORING WELL NETWORK TCEQ PERMIT UNIT NO. 1

CONSULTANT

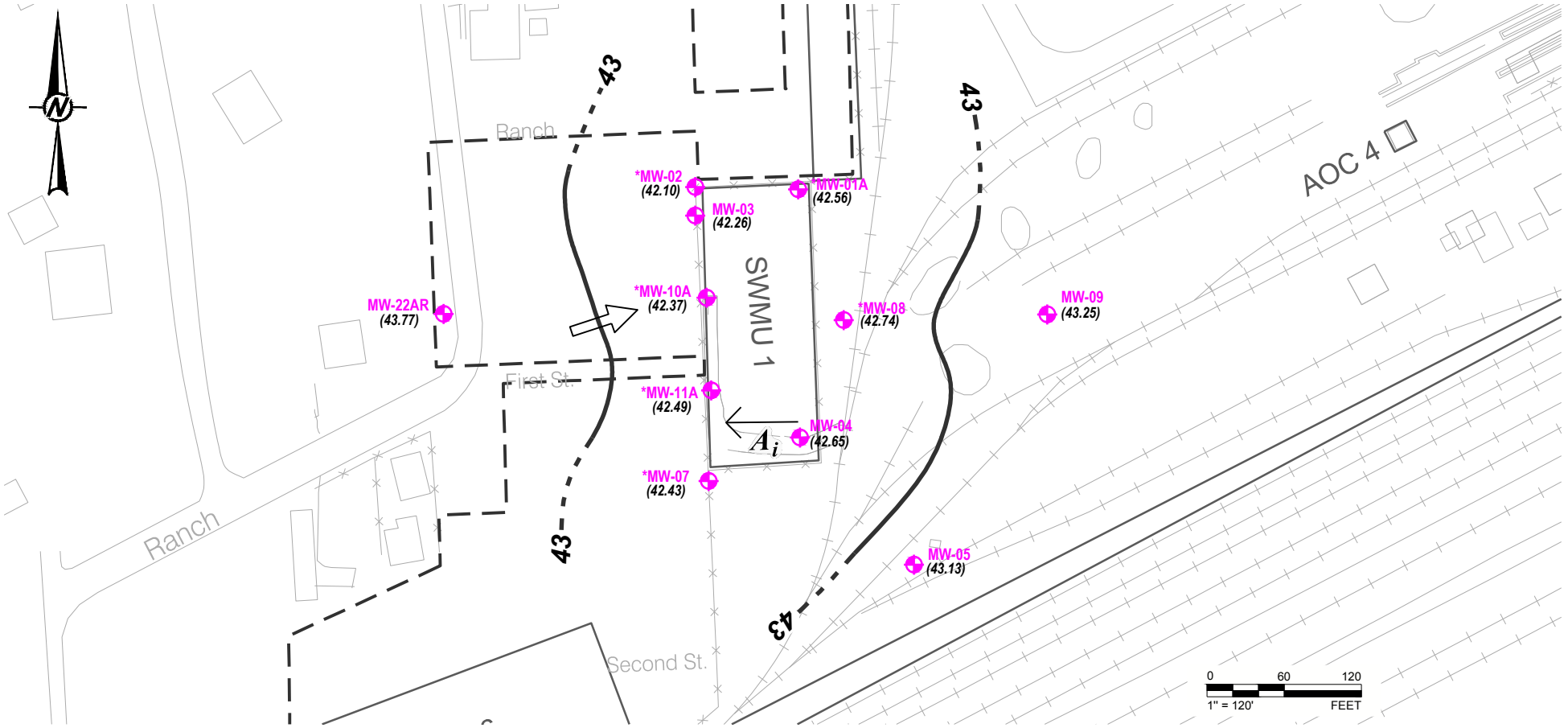
GOLDER
TEXAS GEOSCIENCE FIRM NO. 50369
TEXAS ENGINEERING FIRM NO. 2578

YYYY-MM-DD	2020-06-29
DESIGNED	AJD
PREPARED	AJD
REVIEWED	HM
APPROVED	ECM

PROJECT NO.	REV.	FIGURE
19119232	0	2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A
1 in
0

Last Edited By: adiamond Date: 2021-01-14 Time:10:49:13 AM | Printed By: adiamond Date: 2021-01-14 Time:10:50:02 AM |
Path: \\texarkana\data\Projects - Round Rock_2019\19119232 - HWPW\0-Semi-Annual Monitoring Event\SWMU Figures\2020 - 2nd Semi-Annual\ | File Name: FIG 3 - A-TZ Pot Surface Map (SWMU 1) - July 2020.dwg



LEGEND

- UPRR PROPERTY BOUNDARY
- ROAD, PARKING LOT, SIDEWALK
- FENCE
- RAILROAD
- A-TZ MONITORING WELL LOCATION (*-COMPLIANCE WELL)
- (44.62) GROUNDWATER ELEVATION (FT, HVD) (NM = NOT MEASURED)
- 45 GROUNDWATER ELEVATION CONTOUR (FT, HVD) C.I. = 1.0 FT (DASHED WHERE INFERRED)
- INFERRED GROUNDWATER FLOW DIRECTION

ESTIMATED GRADIENT

$$A_i \rightarrow A_i = \frac{0.16\ ft}{60\ ft} = 0.003\ ft/ft$$

REFERENCE(S)

BASE MAP TAKEN FROM ERM-SOUTHWEST, INC 0014419a310.DWG, 6/19/2006

STATE OF TEXAS
ERIC C. MATZNER
GEOLOGY
LIC. # 795
LICENSED
PROFESSIONAL GEOSCIENTIST
07/11/2021

CLIENT
UNION PACIFIC RAILROAD CO.

PROJECT
HOUSTON WOOD PRESERVING WORKS

TITLE
A-TZ POTENTIOMETRIC SURFACE CONTOUR MAP
JULY 2020

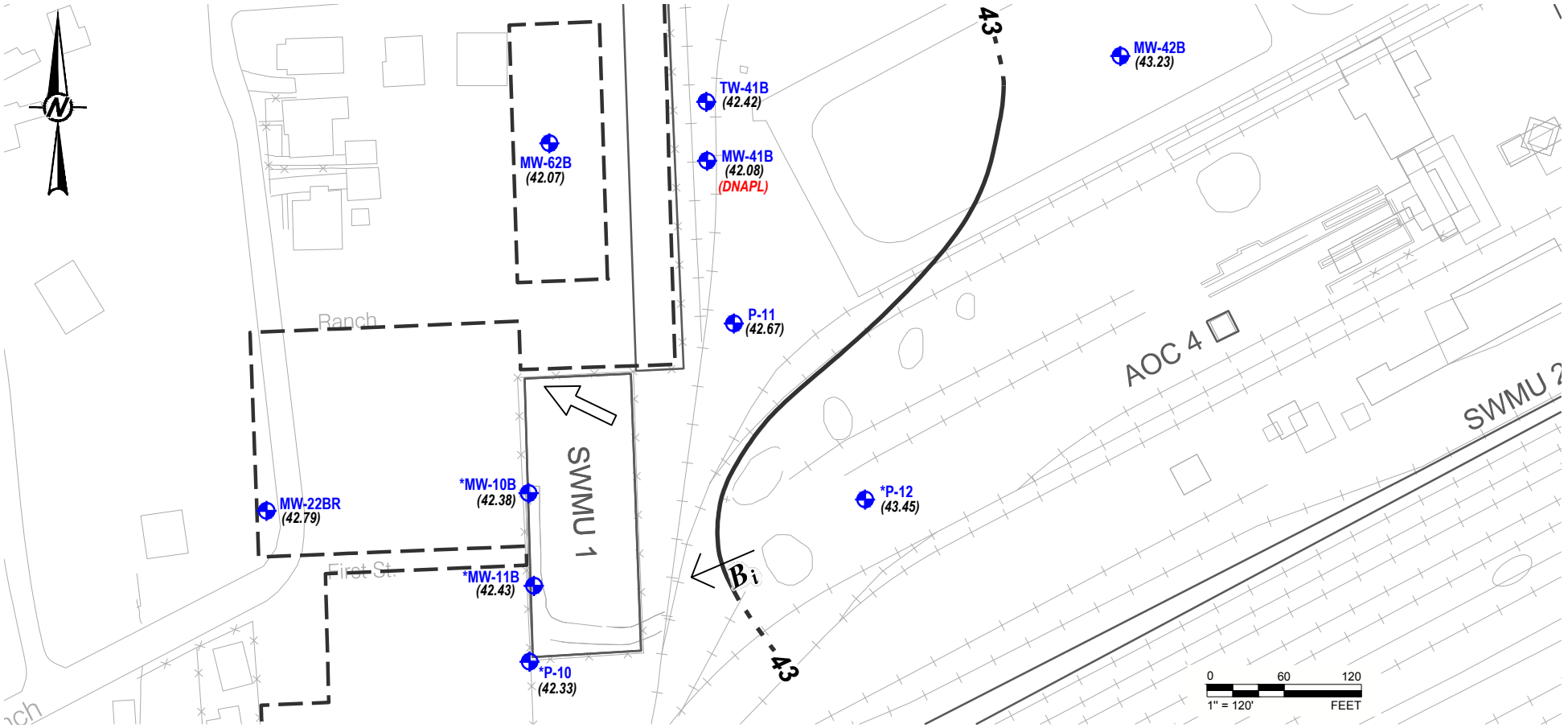
CONSULTANT
GOLDER

YYYY-MM-DD	2021-01-14
DESIGNED	AJD
PREPARED	AJD
REVIEWED	MH
APPROVED	ECM

PROJECT NO. 19119232 | REV. 0 | FIGURE 3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A
1 in
0

Last Edited By: adiamond Date: 2021-01-14 Time:10:51:24 AM | Printed By: adiamond Date: 2021-01-14 Time:10:51:44 AM |
Path: \\texarkana\data\Projects - Round Rock_2019\19119232 - HWPW\0-Semi-Annual Monitoring Event\SWMU Figures\2020 - 2nd Semi-Annual\ | File Name: FIG 4 - B-TZ Pot Surface Map (SWMU 1) - July 2020.dwg



LEGEND

- UPRR PROPERTY BOUNDARY
- ROAD, PARKING LOT, SIDEWALK
- FENCE
- RAILROAD
- B-TZ MONITORING WELL LOCATION (*-COMPLIANCE WELL)
- (44.27) GROUNDWATER ELEVATION (FT, HVD) (NM = NOT MEASURED)
- 45 GROUNDWATER ELEVATION CONTOUR (FT, HVD) C.I. = 1.0 FT (DASHED WHERE INFERRED)
- INFERRED GROUNDWATER FLOW DIRECTION

ESTIMATED GRADIENT

$B_i \rightarrow B_i = \frac{1.02\ ft}{280\ ft} = 0.004\ ft/ft$

REFERENCE(S)

BASE MAP TAKEN FROM ERM-SOUTHWEST, INC 0014419a310.DWG, 6/19/2006

STATE OF TEXAS
ERIC C. MATZNER
GEOLOGY
LIC. # 795
LICENSED
PROFESSIONAL GEOSCIENTIST
01/11/2021

CLIENT
UNION PACIFIC RAILROAD CO.

PROJECT
HOUSTON WOOD PRESERVING WORKS

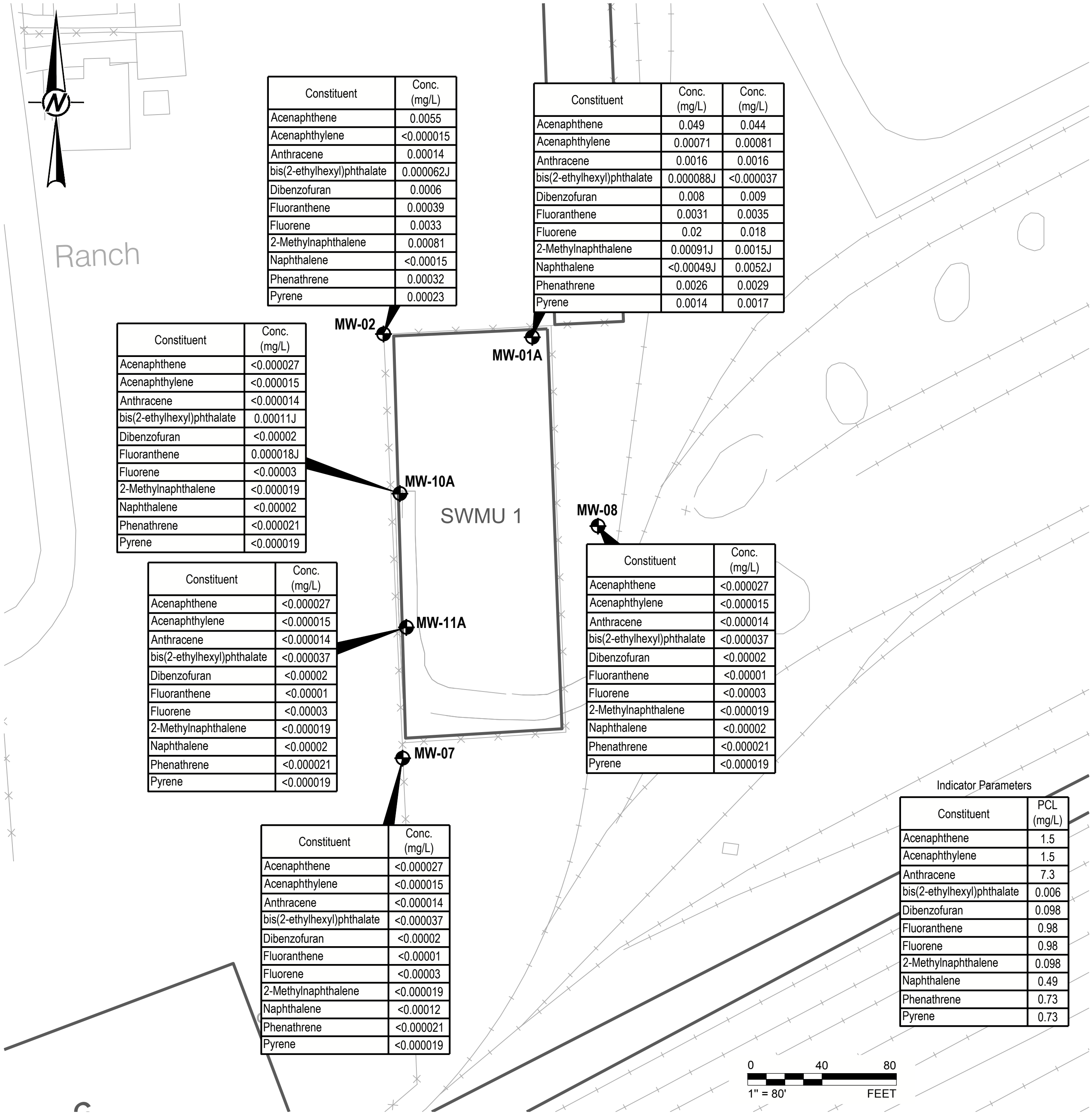
TITLE
B-TZ POTENTIOMETRIC SURFACE CONTOUR MAP
JULY 2020

CONSULTANT
GOLDER

YYYY-MM-DD	2021-01-14
DESIGNED	AJD
PREPARED	AJD
REVIEWED	MH
APPROVED	ECM

PROJECT NO. 19119232 | REV. 0 | FIGURE 4

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A
1 in
0



MW-02

Constituent	Conc. (mg/L)
Acenaphthene	0.0055
Acenaphthylene	<0.000015
Anthracene	0.00014
bis(2-ethylhexyl)phthalate	0.000062J
Dibenzofuran	0.0006
Fluoranthene	0.00039
Fluorene	0.0033
2-Methylnaphthalene	0.00081
Naphthalene	<0.00015
Phenathrene	0.00032
Pyrene	0.00023

MW-01A

Constituent	Conc. (mg/L)	Conc. (mg/L)
Acenaphthene	0.049	0.044
Acenaphthylene	0.00071	0.00081
Anthracene	0.0016	0.0016
bis(2-ethylhexyl)phthalate	0.000088J	<0.000037
Dibenzofuran	0.008	0.009
Fluoranthene	0.0031	0.0035
Fluorene	0.02	0.018
2-Methylnaphthalene	0.00091J	0.0015J
Naphthalene	<0.00049J	0.0052J
Phenathrene	0.0026	0.0029
Pyrene	0.0014	0.0017

MW-10A

Constituent	Conc. (mg/L)
Acenaphthene	<0.000027
Acenaphthylene	<0.000015
Anthracene	<0.000014
bis(2-ethylhexyl)phthalate	0.00011J
Dibenzofuran	<0.00002
Fluoranthene	0.000018J
Fluorene	<0.00003
2-Methylnaphthalene	<0.000019
Naphthalene	<0.00002
Phenathrene	<0.000021
Pyrene	<0.000019

MW-08

Constituent	Conc. (mg/L)
Acenaphthene	<0.000027
Acenaphthylene	<0.000015
Anthracene	<0.000014
bis(2-ethylhexyl)phthalate	<0.000037
Dibenzofuran	<0.00002
Fluoranthene	<0.00001
Fluorene	<0.00003
2-Methylnaphthalene	<0.000019
Naphthalene	<0.00002
Phenathrene	<0.000021
Pyrene	<0.000019

MW-11A

Constituent	Conc. (mg/L)
Acenaphthene	<0.000027
Acenaphthylene	<0.000015
Anthracene	<0.000014
bis(2-ethylhexyl)phthalate	<0.000037
Dibenzofuran	<0.00002
Fluoranthene	<0.00001
Fluorene	<0.00003
2-Methylnaphthalene	<0.000019
Naphthalene	<0.00002
Phenathrene	<0.000021
Pyrene	<0.000019

MW-07

Constituent	Conc. (mg/L)
Acenaphthene	<0.000027
Acenaphthylene	<0.000015
Anthracene	<0.000014
bis(2-ethylhexyl)phthalate	<0.000037
Dibenzofuran	<0.00002
Fluoranthene	<0.00001
Fluorene	<0.00003
2-Methylnaphthalene	<0.000019
Naphthalene	<0.00012
Phenathrene	<0.000021
Pyrene	<0.000019

Indicator Parameters

Constituent	PCL (mg/L)
Acenaphthene	1.5
Acenaphthylene	1.5
Anthracene	7.3
bis(2-ethylhexyl)phthalate	0.006
Dibenzofuran	0.098
Fluoranthene	0.98
Fluorene	0.98
2-Methylnaphthalene	0.098
Naphthalene	0.49
Phenathrene	0.73
Pyrene	0.73

LEGEND

- FENCE
- RAILROAD
- A-TZ MONITORING WELL LOCATION

NOTE(S)

1. SAMPLES COLLECTED IN JULY 2020.
2. J = ESTIMATED VALUE BETWEEN SQL AND MDL.
3. U = VALUE NOT DETECTED GREATER THAN MDL.
4. * FIELD DUPLICATE

REFERENCE(S)

BASE MAP TAKEN FROM ERM-SOUTHWEST, INC 0014419a310.DWG, 6/19/2006.

CLIENT
UNION PACIFIC RAILROAD CO.

PROJECT
HOUSTON WOOD PRESERVING WORKS

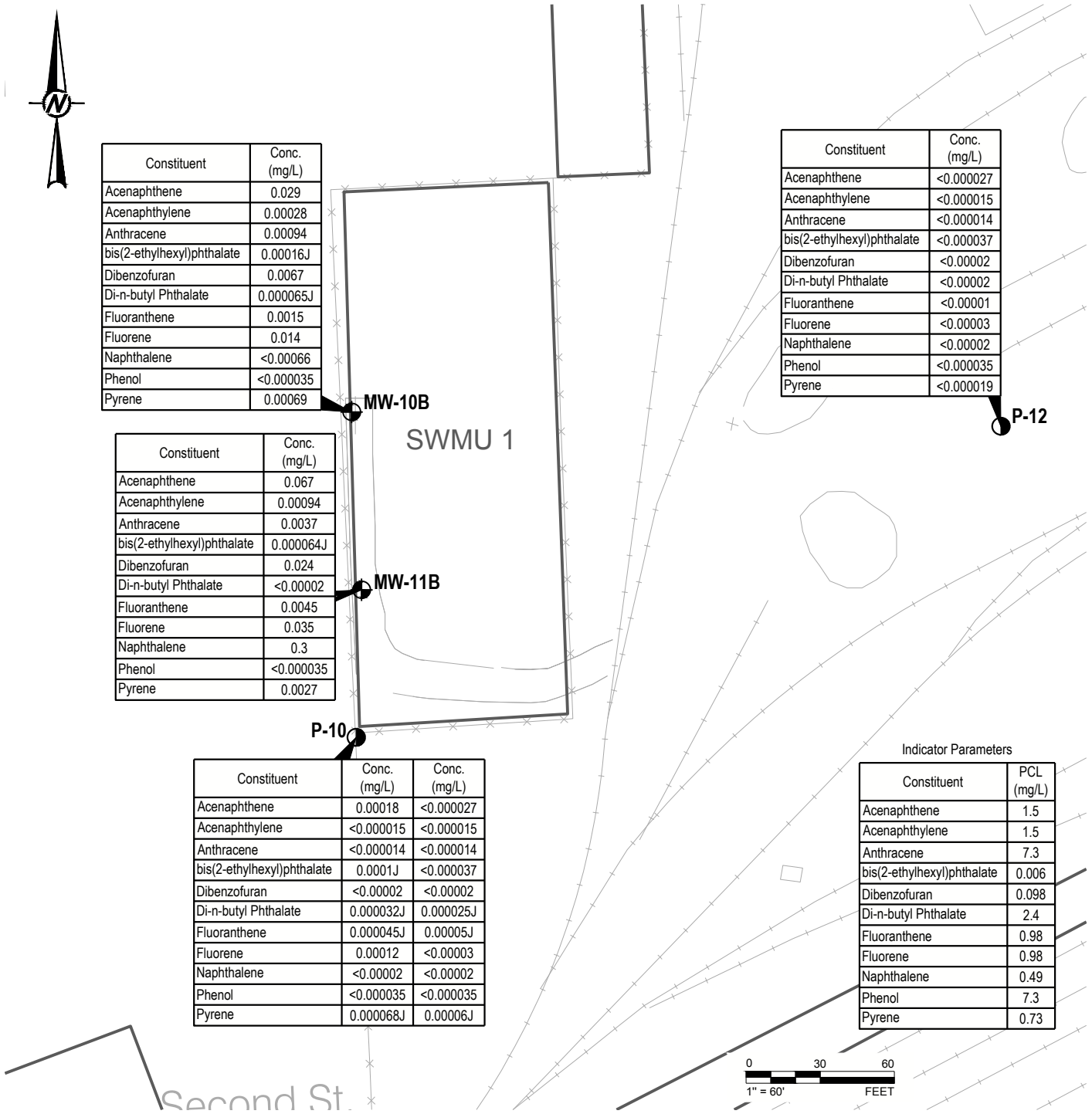
TITLE
A-TZ REPORTED CONCENTRATIONS
2020 2ND SEMI-ANNUAL MONITORING EVENT

CONSULTANT

GOLDER
TEXAS GEOSCIENCE FIRM NO. 50369
TEXAS ENGINEERING FIRM NO. 2578

YYYY-MM-DD	2020-09-11
DESIGNED	AJD
PREPARED	AJD
REVIEWED	MH
APPROVED	ECM

PROJECT NO. 19119232 | REV. 0 | FIGURE 5



Constituent	Conc. (mg/L)
Acenaphthene	0.029
Acenaphthylene	0.00028
Anthracene	0.00094
bis(2-ethylhexyl)phthalate	0.00016J
Dibenzofuran	0.0067
Di-n-butyl Phthalate	0.000065J
Fluoranthene	0.0015
Fluorene	0.014
Naphthalene	<0.00066
Phenol	<0.000035
Pyrene	0.00069

Constituent	Conc. (mg/L)
Acenaphthene	0.067
Acenaphthylene	0.00094
Anthracene	0.0037
bis(2-ethylhexyl)phthalate	0.000064J
Dibenzofuran	0.024
Di-n-butyl Phthalate	<0.00002
Fluoranthene	0.0045
Fluorene	0.035
Naphthalene	0.3
Phenol	<0.000035
Pyrene	0.0027

Constituent	Conc. (mg/L)	Conc. (mg/L)
Acenaphthene	0.00018	<0.000027
Acenaphthylene	<0.000015	<0.000015
Anthracene	<0.000014	<0.000014
bis(2-ethylhexyl)phthalate	0.0001J	<0.000037
Dibenzofuran	<0.00002	<0.00002
Di-n-butyl Phthalate	0.000032J	0.000025J
Fluoranthene	0.000045J	0.00005J
Fluorene	0.00012	<0.00003
Naphthalene	<0.00002	<0.00002
Phenol	<0.000035	<0.000035
Pyrene	0.000068J	0.00006J

Constituent	Conc. (mg/L)
Acenaphthene	<0.000027
Acenaphthylene	<0.000015
Anthracene	<0.000014
bis(2-ethylhexyl)phthalate	<0.000037
Dibenzofuran	<0.00002
Di-n-butyl Phthalate	<0.00002
Fluoranthene	<0.00001
Fluorene	<0.00003
Naphthalene	<0.00002
Phenol	<0.000035
Pyrene	<0.000019

Indicator Parameters

Constituent	PCL (mg/L)
Acenaphthene	1.5
Acenaphthylene	1.5
Anthracene	7.3
bis(2-ethylhexyl)phthalate	0.006
Dibenzofuran	0.098
Di-n-butyl Phthalate	2.4
Fluoranthene	0.98
Fluorene	0.98
Naphthalene	0.49
Phenol	7.3
Pyrene	0.73

LEGEND

- FENCE
- RAILROAD
- B-TZ MONITORING WELL LOCATION
- PIEZOMETER LOCATION

NOTE(S)

1. SAMPLES COLLECTED IN JULY 2020.
2. J = ESTIMATED VALUE BETWEEN SQL AND MDL.
3. U = VALUE NOT DETECTED GREATER THAN MDL.
4. JL = ESTIMATED CONCENTRATION; BIASED LOW.
5. HIGHLIGHTED VALUE EXCEEDS PCL.

REFERENCE(S)

BASE MAP TAKEN FROM ERM-SOUTHWEST, INC 0014419a310.DWG, 6/19/2006.

CLIENT
UNION PACIFIC RAILROAD CO.

PROJECT
HOUSTON WOOD PRESERVING WORKS

TITLE
B-TZ REPORTED CONCENTRATIONS
2020 2ND SEMI-ANNUAL MONITORING EVENT

CONSULTANT
GOLDER
TEXAS GEOSCIENCE FIRM NO. 50369
TEXAS ENGINEERING FIRM NO. 2578

YYYY-MM-DD	2020-09-11
DESIGNED	AJD
PREPARED	AJD
REVIEWED	MH
APPROVED	ECM

PROJECT NO. 19119232 | REV. 0 | FIGURE 6

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A

Last Edited By: adiamond Date: 2020-09-11 Time:11:03:46 AM | Printed By: adiamond Date: 2020-09-11 Time:11:04:17 AM
Path: \\texarkanadata\Projects - Round Rock_2019\19119232 - HWPW\0-Semi-Annual Monitoring Event\SWMU Figures\2020 - 2nd Semi-Annual\ | File Name: FIG 6 - B-TZ Reported Concentrations 2020 2nd SAME.dwg

APPENDIX A

Compliance Plan Tables

TABLE III - CORRECTIVE ACTION PROGRAM
Table of Detected Hazardous and Solid Waste Constituents and
Concentration Limits for the Ground-Water Protection Standard

Closed Surface Impoundment (NOR Unit No. 001, SWMU No. 01)

A-Transmissive Zone		B-Transmissive Zone	
COLUMN A Hazardous Constituents	COLUMN B Concentration Limits (mg/l)	COLUMN A Hazardous Constituents	COLUMN B Concentration Limits (mg/l)
Acenaphthene	1.5[PCL]	Acenaphthene	1.5[PCL]
Acenaphthylene	1.5[PCL]	Acenaphthylene	1.5[PCL]
Anthracene	7.3[PCL]	Anthracene	7.3[PCL]
Dibenzofuran	0.098[PCL]	Dibenzofuran	0.098[PCL]
Bis(2-ethylhexyl)phthalate	0.006[PCL]	Bis(2-ethylhexyl)phthalate	0.006[PCL]
Fluoranthene	0.98[PCL]	Fluoranthene	0.98[PCL]
Fluorene	0.98[PCL]	Fluorene	0.98[PCL]
2-Methylnaphthalene	0.098[PCL]	Di-n-butyl phthalate	2.4[PCL]
Naphthalene	0.49[PCL]	Naphthalene	0.49[PCL]
Phenanthrene	0.73[PCL]	Phenol	7.3[PCL]
Pyrene	0.73[PCL]	Pyrene	0.73[PCL]

PCL Alternate Concentration Limit pursuant to 30 TAC §335.160(b) based upon the Protective Concentration Level determined under 30 TAC Chapter 350 for Residential Land Use. The PCL value, Column B, will change as updates to the rule are promulgated. Changes to the rule automatically change the concentration value established in Column B in this table.

TABLE V
Designation of Wells by Function

POINT OF COMPLIANCE WELLS

1. Closed Surface Impoundment (NOR Unit No. 001, SWMU No. 01)
A-Transmissive Zone: MW-01A, MW-02, MW-07, MW-10A, and MW-11A
B-Transmissive Zone: MW-10B, MW-11B, and P-10

POINT OF EXPOSURE WELLS

1. Closed Surface Impoundment (NOR Unit No. 001, SWMU No. 01)
None

BACKGROUND WELLS

1. Closed Surface Impoundment (NOR Unit No. 001, SWMU No. 01)
A-Transmissive Zone: MW-8
B-Transmissive Zone: P-12

Note: Wells and piezometers identified on Attachment A maps that are not listed in this table are subject to change, upon approval by the executive director, without modification to the Compliance Plan. The wells and piezometers for the Closed Surface Impoundment are depicted on Attachment A, Sheets 3 and 4.

APPENDIX B

Field Parameters

Table B-1
Groundwater Sampling Field Parameters
Semiannual Monitoring Report: 2020 Second Semi-Annual Event

Houston Wood Preserving Works
Houston, Texas

Field Parameter	Monitoring Well IDs									
	A-Transmissive Zone						B-Transmissive Zone			
	MW-01A	MW-02	MW-07	MW-08	MW-10A	MW-11A	MW-10B	MW-11B	P-10	P-12
	7/14/2020	7/14/2020	7/14/2020	7/14/2020	7/14/2020	7/14/2020	7/14/2020	7/14/2020	7/14/2020	7/15/2020
Time Sampled (hrs CST)	8:40	9:25	14:15	13:15	10:15	11:25	10:50	12:15	15:20	8:30
Temperature (ºC)	26.53	25.11	27.62	27.37	24.77	27.22	27.94	29.02	26.17	25.25
pH (Standard Units)	6.78	7.09	7.12	7.31	7.04	7.06	7.26	7.08	7.21	6.2
Specific Conductivity (mmhos/cm)	1210	399	788	671	963	932	1050	1030	1100	1210
Dissolved Oxygen (mg/L)	1.2	1.34	0.82	0.47	1.25	0.76	0.78	0.36	0.22	0.72
Turbidity (NTU)	0.5	9.9	11.9	0	0	0	8.7	2.1	0	0

APPENDIX C

Laboratory Analytical Reports and Data Usability Summaries

Memorandum

September 2, 2020
Revision: January 4, 2021

To:	Eric Matzner	Ref. No.:	11183954-1620
From:	Chris G. Knight/eew/726-NF	Tel:	512-506-8803
cc:	Jesse Orth, Jon Lang; Julie Lidstone		

Subject: **Data Usability Summary**
Semiannual Groundwater Monitoring Event
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works
Houston, Texas
July 2020

1. Scope of Data Usability Study

This document details a Data Usability Summary (DUS) of analytical results for groundwater samples collected in support of the Semiannual Groundwater Monitoring Event at the Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works site during July 2020. Samples were submitted to ALS Environmental (ALS), located in Houston, Texas and are reported in data package HS20070658. The intended use of the data is to support the Semiannual Groundwater Monitoring Event at the site by providing current concentration of chemicals of concern.

Data were reviewed and validated by Chris G. Knight of GHD, in accordance with Title 30 of the Texas Administrative Code Section 350.54 (30 TAC 350.54) as described in the Texas Commission on Environmental Quality (TCEQ) Regulatory Guidance document entitled "Review and Reporting of COC Concentration Data under TRRP", (RG-366/TRRP-13), revised May 2010, herein referred to as "TRRP-13 Guidance". Evaluation of the data was based on information obtained from the chain of custody forms, the finished report forms, method blank data, recovery data from surrogate spikes/laboratory control samples (LCS)/matrix spikes (MS), duplicate data, field quality assurance/quality control (QA/QC) samples, the laboratory review checklists (LRC), and the laboratory exception report (ER).

A sample collection and analysis summary is presented in Table 1. This summary provides a cross-reference of field sample identification numbers and location identification. Each sample is assigned a unique field identification number.

The validated sample results are presented in Table 2. A summary of the analytical methodology is presented in Table 3.

2. Laboratory Qualifications

The Laboratory's quality assurance program is consistent with the quality standards outlined in the National Environmental Laboratory Accreditation Program (NELAP). This laboratory was accredited under Texas Certification number # TX104704231 at the time the analysis was performed and the certificate is included in Attachment A.

3. Project Objectives

3.1 Sampling/Analytical QA/QC Objectives

The QA/QC program was designed to identify contamination resulting from the sampling, sample transport and analytical process through the analysis of field blank samples, a field duplicate sample set, and method blanks. The QA/QC program was designed to evaluate the quality of the resulting data with respect to bias and precision through analysis of LCS and MS.

4. Data Review/Validation Results

4.1 Sample Holding Time and Preservation

Samples were shipped with a chain of custody and the paper work was filled out properly with the following exception:

i) The sample collection time for sample WG-1620-MW10B-20200714 differs on the chain of custody from the sample labels. This sample was logged in using the time listed on the chain of custody. No further action was required.

All samples were properly preserved, delivered on ice, and stored by the laboratory at the required temperature (0-6°C).

The sample chain of custody documents and the analytical report were used to determine sample holding times. All samples were prepared and analyzed within the required holding times.

4.2 Sample Containers

Sample containers used were certified pre-cleaned glass containers provided by the laboratory. These containers meet or exceed analyte specifications established in the United States Environmental Protection Agency (USEPA) *Specifications and Guidance for Contaminant-free Sample Containers*.

4.3 Calibrations

According to the LRC, initial calibration and continuing calibration data met the criteria for the selected method.

4.4 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. As these were not discrete samples handled in the field, these blanks are not listed on the sample identification cross-reference list found in the data package.

For this study, laboratory method blanks were analyzed at a minimum frequency of one per twenty investigative samples and/or one per analytical batch and results are reported in the laboratory data package.

The method blank results were non-detect or below the method quantitation limit (MQL), indicating that laboratory contamination was not a factor for this investigation.

4.5 Internal Standard and Surrogate Spike Recoveries

Recoveries of internal standards are addressed in the LRC of the data package. All internal standard recoveries associated with the compounds of interest were acceptable per the LRC.

In accordance with the methods employed, all samples, blanks, and QC samples analyzed for semi-volatile organic compounds (SVOCs) are spiked with surrogate compounds prior to sample analysis. Surrogate recoveries provide a means to evaluate the effects of laboratory performance on individual sample matrices. The recovery ranges established by the laboratory are adopted as the acceptance criteria for the project. Each individual surrogate compound is expected to meet the laboratory control limits. According to the TRRP-13 Guidelines, one outlying surrogate is acceptable for methods with multiple surrogate spike compounds as long as the recovery is at least ten percent. Sample analyzed at elevated sample dilutions (five times or greater) were not assessed.

Surrogate recoveries were assessed against laboratory control limits and/or the guidance in TRRP-13. All surrogate recoveries met the above criteria.

4.6 Laboratory Control Sample Analysis

LCS are prepared and analyzed as samples to assess the analytical efficiencies of the methods employed, independent of sample matrix effects. The recovery ranges established by the laboratory are adopted as the acceptance criteria for the project.

For this study, LCS were analyzed at a minimum frequency of one per twenty investigative samples and/or one per analytical batch.

The LCS contained all compounds specified in the method. All LCS recoveries were within the laboratory control limits, demonstrating acceptable analytical accuracy.

4.7 Matrix Spike Analysis

To evaluate the effects of sample matrices on the preparation process, measurement procedures, and accuracy of a particular analysis, samples are spiked with known concentrations of the analytes of interest

and analyzed as MS/matrix spike duplicate (MSD) samples. The RPD between the MS and MSD is used to assess analytical precision.

An MS/MSD analysis was performed as specified in Table 1. The recovery ranges established by the laboratory is adopted as the acceptance criteria for the project.

The MS/MSD samples were spiked with all compounds specified in the method. All percent recoveries and the RPD value were within the laboratory control limits, demonstrating acceptable analytical accuracy and precision.

4.8 Field QA/QC Samples

The field QA/QC consisted of two field blank samples and two field duplicate sample set.

Field Blank Sample Analysis

To assess ambient conditions at the site, two field blank samples were submitted for analysis, as identified in Table 1. All results were non-detect for the compounds of interest with the following exceptions (see Table 4):

i) WG-1620-FB01-20200714 was reported with low level detections for dibenzofuran and naphthalene. Associated sample results that were either significantly greater than the field blank detections or were non-detect were not affected. No further actions were required. Associated sample results with similar detections to the field blank detections were qualified as non-detect.

Field Duplicate Sample Analysis

To assess the analytical and sampling protocol precision, two field duplicate sample sets were collected and submitted "blind" to the laboratory, as specified in Table 1. The RPDs associated with these duplicate samples must be less than thirty percent for water samples. The RPDs are only used when sample concentrations are above the estimated regions of detection.

Field duplicate summary data are presented in Table 2. All field duplicate results were within acceptable agreement, demonstrating acceptable sampling and analytical precision with the following exceptions (see Table 5):

i) WG-1620-MW01A-20200714 and WG-1620-DUP01-20200714 did show some variability in 2-methylnaphthalene and naphthalene results and were qualified as estimated.

4.9 Field Procedures

Golder Associates, Inc. collected groundwater samples in accordance with their Standard Operating Procedures (SOP) for sample collection.

4.10 Analyte Reporting

The laboratory reported detected results for each analyte down to the sample detection limit (SDL), which is defined as the method detection limit (MDL) with sample-specific adjustments for dilutions, aliquot size,

volumes, etc. Positive analyte detections less than the MQL but greater than the SDL were qualified as estimated (J) in Table 2 unless qualified elsewhere in this memorandum.

The detectability check standard (DCS) results supported the laboratory MDLs.

5. Conclusion

Based on the assessment detailed in the foregoing, the data summarized in Table 2 are usable for the purpose of supporting the Semiannual Groundwater Monitoring Event at the site by providing current concentration of chemicals of concern with the specific qualifications noted herein.

Table 1

Sample Collection and Analysis Summary
Semiannual Groundwater Monitoring Event
Union Pacific Railroad (UPRR)/Houston, TX-Wood Preserving Works
Houston, Texas
July 2020

					Analysis/Parameters	
Sample Identification	**Location**	**Matrix**	**Collection Date (mm/dd/yyyy)**	**Collection Time (hr:min)**	**SVOCs**	**Comments**
WG-1620-MW01A-20200714	MW-01A	Water	07/14/2020	08:40	X	
WG-1620-DUP01-20200714	MW-01A	Water	07/14/2020	08:40	X	Field duplicate of MW-01A
WG-1620-MW02-20200714	MW-02	Water	07/14/2020	09:25	X	
WG-1620-MW10A-20200714	MW-10A	Water	07/14/2020	10:15	X	
WG-1620-MW10B-20200714	MW-10B	Water	07/14/2020	10:50	X	
WG-1620-MW11A-20200714	MW-11A	Water	07/14/2020	11:25	X	
WG-1620-MW11B-20200714	MW-11B	Water	07/14/2020	12:15	X	
WG-1620-MW08-20200714	MW-08	Water	07/14/2020	13:15	X	
WG-1620-MW07-20200714	MW-07	Water	07/14/2020	14:15	X	
WG-1620-P10-20200714	P-10	Water	07/14/2020	15:20	X	
WG-1620-DUP02-20200714	P-10	Water	07/14/2020	15:20	X	Field duplicate of P-10
WG-1620-FB01-20200714	-	Water	07/14/2020	16:00	X	Field Blank
WG-1620-P12-20200715	P-12	Water	07/15/2020	08:30	X	MS/MSD
WG-1620-FB02-20200715	-	Water	07/15/2020	09:30	X	Field Blank

Notes:

SVOCs - Semi-volatile Organic Compounds
MS/MSD - Matrix Spike/ Matrix Spike Duplicate
"-" - Not Applicable

Table 2

Analytical Results Summary
Semiannual Groundwater Monitoring Event
Union Pacific Railroad (UPRR)/Houston, TX-Wood Preserving Works
Houston, Texas
July 2020

Location ID:		MW-01A	MW-01A	MW-02	MW-07
Sample Name:		WG-1620-MW01A-20200714	WG-1620-DUP01-20200714	WG-1620-MW02-20200714	WG-1620-MW07-20200714
Sample Date:		07/14/2020	07/14/2020	07/14/2020	07/14/2020
			Duplicate		
Parameters	**Unit**				
Semi-volatile Organic Compounds					
2-Methylnaphthalene	mg/L	0.00091 J	0.0015 J	0.00081	<0.000019
Acenaphthene	mg/L	0.049	0.044	0.0055	<0.000027
Acenaphthylene	mg/L	0.00071	0.00081	<0.000015	<0.000015
Anthracene	mg/L	0.0016	0.0016	0.00014	<0.000014
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	0.000088 J	<0.000037	0.000062 J	<0.000037
Di-n-butylphthalate (DBP)	mg/L	--	--	--	--
Dibenzofuran	mg/L	0.0080	0.0090	0.00060	<0.000020
Fluoranthene	mg/L	0.0031	0.0035	0.00039	<0.000010
Fluorene	mg/L	0.020	0.018	0.0033	<0.000030
Naphthalene	mg/L	<0.00049 J	0.0052 J	<0.00015	<0.00012
Phenanthrene	mg/L	0.0026	0.0029	0.00032	<0.000021
Phenol	mg/L	--	--	--	--
Pyrene	mg/L	0.0014	0.0017	0.00023	<0.000019

Table 2

Analytical Results Summary
Semiannual Groundwater Monitoring Event
Union Pacific Railroad (UPRR)/Houston, TX-Wood Preserving Works
Houston, Texas
July 2020

Location ID:		MW-08	MW-10A	MW-10B	MW-11A
Sample Name:		WG-1620-MW08-20200714	WG-1620-MW10A-20200714	WG-1620-MW10B-20200714	WG-1620-MW11A-20200714
Sample Date:		07/14/2020	07/14/2020	07/14/2020	07/14/2020
Parameters	**Unit**				
Semi-volatile Organic Compounds					
2-Methylnaphthalene	mg/L	<0.000019	<0.000019	--	<0.000019
Acenaphthene	mg/L	<0.000027	<0.000027	0.029	<0.000027
Acenaphthylene	mg/L	<0.000015	<0.000015	0.00028	<0.000015
Anthracene	mg/L	<0.000014	<0.000014	0.00094	<0.000014
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	<0.000037	0.00011 J	0.00016 J	<0.000037
Di-n-butylphthalate (DBP)	mg/L	--	--	0.000065 J	--
Dibenzofuran	mg/L	<0.000020	<0.000020	0.0067	<0.000020
Fluoranthene	mg/L	<0.000010	0.000018 J	0.0015	<0.000010
Fluorene	mg/L	<0.000030	<0.000030	0.014	<0.000030
Naphthalene	mg/L	<0.000020	<0.000020	<0.00066	<0.000020
Phenanthrene	mg/L	<0.000021	<0.000021	--	<0.000021
Phenol	mg/L	--	--	<0.000035	--
Pyrene	mg/L	<0.000019	<0.000019	0.00069	<0.000019

Analytical Results Summary
Semiannual Groundwater Monitoring Event
Union Pacific Railroad (UPRR)/Houston, TX-Wood Preserving Works
Houston, Texas
July 2020

Location ID:		MW-11B	P-10	P-10	P-12
Sample Name:		WG-1620-MW11B-20200714	WG-1620-P10-20200714	WG-1620-DUP02-20200714	WG-1620-P12-20200715
Sample Date:		07/14/2020	07/14/2020	07/14/2020	07/15/2020
				Duplicate	
Parameters	**Unit**				
Semi-volatile Organic Compounds					
2-Methylnaphthalene	mg/L	--	--	--	--
Acenaphthene	mg/L	0.067	0.00018	<0.000027	<0.000027
Acenaphthylene	mg/L	0.00094	<0.000015	<0.000015	<0.000015
Anthracene	mg/L	0.0037	<0.000014	<0.000014	<0.000014
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	0.000064 J	0.00010 J	<0.000037	<0.000037
Di-n-butylphthalate (DBP)	mg/L	<0.000020	0.000032 J	0.000025 J	<0.000020
Dibenzofuran	mg/L	0.024	<0.000020	<0.000020	<0.000020
Fluoranthene	mg/L	0.0045	0.000045 J	0.000050 J	<0.000010
Fluorene	mg/L	0.035	0.00012	<0.000030	<0.000030
Naphthalene	mg/L	0.30	<0.000020	<0.000020	<0.000020
Phenanthrene	mg/L	--	--	--	--
Phenol	mg/L	<0.000035	<0.000035	<0.000035	<0.000035
Pyrene	mg/L	0.0027	0.000068 J	0.000060 J	<0.000019

Notes:

< - Not detected at the associated reporting limit

J - Estimated concentration

"--" - Not applicable

Table 3

Analytical Methods
Semiannual Groundwater Monitoring Event
Union Pacific Railroad (UPRR)/Houston, TX-Wood Preserving Works
Houston, Texas
July 2020

			Holding Time	
Parameter	**Method**	**Matrix**	**Collection to Extraction (Days)**	**Extraction to Analysis (Days)**
SVOCs	SW-846 8270D	Water	7	40

Notes:

SVOCs - Semi-volatile Organic Compounds

Method References:

SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, 1986, with subsequent revisions

Table 4

Qualified Sample Data Due to Analyte Concentrations in the Field Blanks
Semiannual Groundwater Monitoring Event
Union Pacific Railroad (UPRR)/Houston, TX-Wood Preserving Works
Houston, Texas
July 2020

Parameter	Field Blank ID	Blank Date (dd/mm/yyyy)	Analyte	Blank Result	Associated Sample ID	Original Result	Qualified Result	Units
SVOCs	WG-1620-FB01-20200714	07/14/2020	Naphthalene	0.00028	WG-1620-MW01A-20200714	0.00049	<0.00049 J	mg/L
					WG-1620-MW02-20200714	0.00015	<0.00015	mg/L
					WG-1620-MW07-20200714	0.00012	<0.00012	mg/L
					WG-1620-MW10B-20200714	0.00066	<0.00066	mg/L

Notes:

SVOCs - Semi-volatile Organic Compounds
< - Not detected at the associated reporting limit
J - Estimated concentration

Table 5

Qualified Sample Data Due to Variability in Field Duplicate Results
Semiannual Groundwater Monitoring Event
Union Pacific Railroad (UPRR)/Houston, TX-Wood Preserving Works
Houston, Texas
July 2020

Parameter	Analyte	RPD	Sample ID	Qualified Result	Field Duplicate Sample ID	Qualified Result	Units
SVOCs	2-Methylnaphthalene	49.0	WG-1620-MW01A-20200714	0.00091 J	WG-1620-DUP01-20200714	0.0015 J	mg/L
	Naphthalene	165		<0.00049 J		0.0052 J	mg/L

Notes:

RPD - Relative Percent Difference
SVOCs - Semi-volatile Organic Compounds
< - Not detected at the associated reporting limit
J - Estimated concentration

Attachment A
Laboratory NELAP Certificate

Texas Commission on Environmental Quality

NELAP-Recognized Laboratory Accreditation is hereby awarded to

ALS Laboratory Group, Environmental Services Division (Houston, Texas)

10450 Stancliff Road, Suite 210
Houston, TX 77099-4338

in accordance with Texas Water Code Chapter 5, Subchapter R, Title 30 Texas Administrative Code Chapter 25, and the National Environmental Laboratory Accreditation Program.

The laboratory's scope of accreditation includes the fields of accreditation that accompany this certificate. Continued accreditation depends upon successful ongoing participation in the program. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current location(s) and accreditation status for particular methods and analyses (www.tceq.texas.gov/goto/lab). Accreditation does not imply that a product, process, system or person is approved by the Texas Commission on Environmental Quality.

Certificate Number: T104704231-20-26
Effective Date: 5/1/2020
Expiration Date: 4/30/2021

Executive Director Texas Commission on Environmental Quality

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

July 24, 2020

Eric Matzner
Golder Associates Inc.
2201 Double Creek Drive
Suite 4004
Round Rock, TX 78664

Work Order: **HS20070658**

Laboratory Results for: **Houston TX-Wood Preserving Works SWMU1**

Dear Eric Matzner,

ALS Environmental received 14 sample(s) on Jul 15, 2020 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client:	Golder Associates Inc.	**TRRP Laboratory Data Package Cover Page**
Project:	Houston TX-Wood Preserving Works SWMU1	
WorkOrder:	**HS20070658**	

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 Sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

a) Items consistent with NELAC Chapter 5,
b) dilution factors,
c) preparation methods,
d) cleanup methods, and
e) if required for the project, tentatively identified compounds (TICs).

R4 Surrogate recovery data including:

a) Calculated recovery (%R), and
b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms for laboratory control samples (LCSs) including:

a) LCS spiking amounts,
b) Calculated %R for each analyte, and
c)The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

a) Samples associated with the MS/MSD clearly identified,
b) MS/MSD spiking amounts,
c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
d) Calculated %Rs and relative percent differences (RPDs), and
e) The laboratory's MS/MSD QC limits.

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

a) the amount of analyte measured in the duplicate,
b) the calculated RPD, and
c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.

R10 Other problems or anomalies.
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Client:	Golder Associates Inc.	**TRRP Laboratory Data Package Cover Page**
Project:	Houston TX-Wood Preserving Works SWMU1	
WorkOrder:	**HS20070658**	

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [ ] TCEQ or [ ] _____ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 07/24/2020				
Project Name: Houston TX-Wood Preserving Works SWMU1			Laboratory Job Number: HS20070658				
Reviewer Name: Dane Wacasey			Prep Batch Number: 155547				
#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?	X				
		Were surrogate percent recoveries in all samples within the laboratory QC limits?		X			1
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	**Analytical duplicate data**					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	**Method quantitation limits (MQLs):**					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	**Other problems/anomalies**					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 07/24/2020				
Project Name: Houston TX-Wood Preserving Works SWMU1			Laboratory Job Number: HS20070658				
Reviewer Name: Dane Wacasey			Prep Batch Number: 155547				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
S1	OI	**Initial calibration (ICAL)**					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)**					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?			X		
S3	O	**Mass spectral tuning:**					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
S4	O	**Internal standards (IS):**					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	**Raw data** (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	**Dual column confirmation**					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	**Tentatively identified compounds (TICs):**					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	**Interference Check Sample (ICS) results:**					
		Were percent recoveries within method QC limits?			X		
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
S10	OI	**Method detection limit (MDL) studies**					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
S11	OI	**Proficiency test reports:**					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	**Standards documentation**					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	**Compound/analyte identification procedures**					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	**Demonstration of analyst competency (DOC)**					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	**Verification/validation documentation for methods** (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	**Laboratory standard operating procedures (SOPs):**					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Exception Reports	
Laboratory Name: ALS Laboratory Group	LRC Date: 07/24/2020
Project Name: Houston TX-Wood Preserving Works SWMU1	Laboratory Job Number: HS20070658
Reviewer Name: Dane Wacasey	Prep Batch Number: 155547

ER#[5]	Description
1	Semivolatile Organics Method SW8270, sample WG-1620-MW11B-20200714, the surrogate recoveries could not be determined due to dilution below the calibration range.

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);
NA = Not Applicable;
NR = Not Reviewed;
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works SWMU1
Work Order: HS20070658

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20070658-01	WG-1620-MW01A-20200714	Water		14-Jul-2020 08:40	15-Jul-2020 15:55	☐
HS20070658-02	WG-1620-MW02-20200714	Water		14-Jul-2020 09:25	15-Jul-2020 15:55	☐
HS20070658-03	WG-1620-MW10A-20200714	Water		14-Jul-2020 10:15	15-Jul-2020 15:55	☐
HS20070658-04	WG-1620-MW10B-20200714	Water		14-Jul-2020 10:50	15-Jul-2020 15:55	☐
HS20070658-05	WG-1620-MW11A-20200714	Water		14-Jul-2020 11:25	15-Jul-2020 15:55	☐
HS20070658-06	WG-1620-MW11B-20200714	Water		14-Jul-2020 12:15	15-Jul-2020 15:55	☐
HS20070658-07	WG-1620-MW08-20200714	Water		14-Jul-2020 13:15	15-Jul-2020 15:55	☐
HS20070658-08	WG-1620-MW07-20200714	Water		14-Jul-2020 14:15	15-Jul-2020 15:55	☐
HS20070658-09	WG-1620-P10-20200714	Water		14-Jul-2020 15:20	15-Jul-2020 15:55	☐
HS20070658-10	WG-1620-DUP01-20200714	Water		14-Jul-2020 00:00	15-Jul-2020 15:55	☐
HS20070658-11	WG-1620-DUP02-20200714	Water		14-Jul-2020 00:00	15-Jul-2020 15:55	☐
HS20070658-12	WG-1620-FB01-20200714	Water		14-Jul-2020 16:00	15-Jul-2020 15:55	☐
HS20070658-13	WG-1620-P12-20200715	Water		15-Jul-2020 08:30	15-Jul-2020 15:55	☐
HS20070658-14	WG-1620-FB02-20200715	Water		15-Jul-2020 09:30	15-Jul-2020 15:55	☐

Client: Golder Associates Inc.
ANALYTICAL REPORT
Project: Houston TX-Wood Preserving Works SWMU1
WorkOrder:HS20070658
Sample ID: WG-1620-MW01A-20200714
Lab ID:HS20070658-01
Collection Date: 14-Jul-2020 08:40
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3510 / 20-Jul-2020		Analyst: GEY
2-Methylnaphthalene	**0.00091**		**0.000019**	**0.00010**	**mg/L**	1	20-Jul-2020 20:34
Acenaphthene	**0.049**		**0.00027**	**0.0010**	**mg/L**	10	20-Jul-2020 20:53
Acenaphthylene	**0.00071**		**0.000015**	**0.00010**	**mg/L**	1	20-Jul-2020 20:34
Anthracene	**0.0016**		**0.000014**	**0.00010**	**mg/L**	1	20-Jul-2020 20:34
Bis(2-ethylhexyl)phthalate	**0.000088**	J	**0.000037**	**0.00020**	**mg/L**	1	20-Jul-2020 20:34
Dibenzofuran	**0.0080**		**0.000020**	**0.00010**	**mg/L**	1	20-Jul-2020 20:34
Fluoranthene	**0.0031**		**0.000010**	**0.00010**	**mg/L**	1	20-Jul-2020 20:34
Fluorene	**0.020**		**0.00030**	**0.0010**	**mg/L**	10	20-Jul-2020 20:53
Naphthalene	**0.00049**		**0.000020**	**0.00010**	**mg/L**	1	20-Jul-2020 20:34
Phenanthrene	**0.0026**		**0.000021**	**0.00010**	**mg/L**	1	20-Jul-2020 20:34
Pyrene	**0.0014**		**0.000019**	**0.00010**	**mg/L**	1	20-Jul-2020 20:34
Surr: 2,4,6-Tribromophenol	*84.5*			*34-129*	*%REC*	*10*	*20-Jul-2020 20:53*
Surr: 2,4,6-Tribromophenol	*73.5*			*34-129*	*%REC*	*1*	*20-Jul-2020 20:34*
Surr: 2-Fluorobiphenyl	*42.8*			*40-125*	*%REC*	*1*	*20-Jul-2020 20:34*
Surr: 2-Fluorobiphenyl	*43.1*			*40-125*	*%REC*	*10*	*20-Jul-2020 20:53*
Surr: 2-Fluorophenol	*40.9*			*20-120*	*%REC*	*10*	*20-Jul-2020 20:53*
Surr: 2-Fluorophenol	*35.8*			*20-120*	*%REC*	*1*	*20-Jul-2020 20:34*
Surr: 4-Terphenyl-d14	*62.9*			*40-135*	*%REC*	*10*	*20-Jul-2020 20:53*
Surr: 4-Terphenyl-d14	*62.6*			*40-135*	*%REC*	*1*	*20-Jul-2020 20:34*
Surr: Nitrobenzene-d5	*42.2*			*41-120*	*%REC*	*1*	*20-Jul-2020 20:34*
Surr: Nitrobenzene-d5	*42.2*			*41-120*	*%REC*	*10*	*20-Jul-2020 20:53*
Surr: Phenol-d6	*41.6*			*20-120*	*%REC*	*1*	*20-Jul-2020 20:34*
Surr: Phenol-d6	*41.1*			*20-120*	*%REC*	*10*	*20-Jul-2020 20:53*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
ANALYTICAL REPORT
Project: Houston TX-Wood Preserving Works SWMU1 WorkOrder:HS20070658
Sample ID: WG-1620-MW02-20200714 Lab ID:HS20070658-02
Collection Date: 14-Jul-2020 09:25 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3510 / 20-Jul-2020		Analyst: GEY
2-Methylnaphthalene	**0.00081**		**0.000019**	**0.00010**	**mg/L**	1	20-Jul-2020 14:47
Acenaphthene	**0.0055**		**0.000027**	**0.00010**	**mg/L**	1	20-Jul-2020 14:47
Acenaphthylene	U		0.000015	0.00010	mg/L	1	20-Jul-2020 14:47
Anthracene	**0.00014**		**0.000014**	**0.00010**	**mg/L**	1	20-Jul-2020 14:47
Bis(2-ethylhexyl)phthalate	**0.000062**	J	**0.000037**	**0.00020**	**mg/L**	1	20-Jul-2020 14:47
Dibenzofuran	**0.00060**		**0.000020**	**0.00010**	**mg/L**	1	20-Jul-2020 14:47
Fluoranthene	**0.00039**		**0.000010**	**0.00010**	**mg/L**	1	20-Jul-2020 14:47
Fluorene	**0.0033**		**0.000030**	**0.00010**	**mg/L**	1	20-Jul-2020 14:47
Naphthalene	**0.00015**		**0.000020**	**0.00010**	**mg/L**	1	20-Jul-2020 14:47
Phenanthrene	**0.00032**		**0.000021**	**0.00010**	**mg/L**	1	20-Jul-2020 14:47
Pyrene	**0.00023**		**0.000019**	**0.00010**	**mg/L**	1	20-Jul-2020 14:47
Surr: 2,4,6-Tribromophenol	*75.3*			*34-129*	*%REC*	*1*	*20-Jul-2020 14:47*
Surr: 2-Fluorobiphenyl	*55.9*			*40-125*	*%REC*	*1*	*20-Jul-2020 14:47*
Surr: 2-Fluorophenol	*65.0*			*20-120*	*%REC*	*1*	*20-Jul-2020 14:47*
Surr: 4-Terphenyl-d14	*78.0*			*40-135*	*%REC*	*1*	*20-Jul-2020 14:47*
Surr: Nitrobenzene-d5	*69.3*			*41-120*	*%REC*	*1*	*20-Jul-2020 14:47*
Surr: Phenol-d6	*71.6*			*20-120*	*%REC*	*1*	*20-Jul-2020 14:47*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
ANALYTICAL REPORT
Project: Houston TX-Wood Preserving Works SWMU1 WorkOrder:HS20070658
Sample ID: WG-1620-MW10A-20200714 Lab ID:HS20070658-03
Collection Date: 14-Jul-2020 10:15 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3510 / 20-Jul-2020		Analyst: GEY
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	20-Jul-2020 20:15
Acenaphthene	U		0.000027	0.00010	mg/L	1	20-Jul-2020 20:15
Acenaphthylene	U		0.000015	0.00010	mg/L	1	20-Jul-2020 20:15
Anthracene	U		0.000014	0.00010	mg/L	1	20-Jul-2020 20:15
Bis(2-ethylhexyl)phthalate	**0.00011**	J	**0.000037**	**0.00020**	**mg/L**	1	20-Jul-2020 20:15
Dibenzofuran	U		0.000020	0.00010	mg/L	1	20-Jul-2020 20:15
Fluoranthene	**0.000018**	J	**0.000010**	**0.00010**	**mg/L**	1	20-Jul-2020 20:15
Fluorene	U		0.000030	0.00010	mg/L	1	20-Jul-2020 20:15
Naphthalene	U		0.000020	0.00010	mg/L	1	20-Jul-2020 20:15
Phenanthrene	U		0.000021	0.00010	mg/L	1	20-Jul-2020 20:15
Pyrene	U		0.000019	0.00010	mg/L	1	20-Jul-2020 20:15
Surr: 2,4,6-Tribromophenol	*66.2*			*34-129*	*%REC*	*1*	*20-Jul-2020 20:15*
Surr: 2-Fluorobiphenyl	*50.2*			*40-125*	*%REC*	*1*	*20-Jul-2020 20:15*
Surr: 2-Fluorophenol	*46.4*			*20-120*	*%REC*	*1*	*20-Jul-2020 20:15*
Surr: 4-Terphenyl-d14	*79.8*			*40-135*	*%REC*	*1*	*20-Jul-2020 20:15*
Surr: Nitrobenzene-d5	*49.6*			*41-120*	*%REC*	*1*	*20-Jul-2020 20:15*
Surr: Phenol-d6	*53.9*			*20-120*	*%REC*	*1*	*20-Jul-2020 20:15*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
ANALYTICAL REPORT
Project: Houston TX-Wood Preserving Works SWMU1 WorkOrder:HS20070658
Sample ID: WG-1620-MW10B-20200714 Lab ID:HS20070658-04
Collection Date: 14-Jul-2020 10:50 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3510 / 20-Jul-2020		Analyst: GEY
Acenaphthene	**0.029**		**0.00027**	**0.0010**	**mg/L**	10	24-Jul-2020 12:17
Acenaphthylene	**0.00028**		**0.000015**	**0.00010**	**mg/L**	1	22-Jul-2020 21:39
Anthracene	**0.00094**		**0.000014**	**0.00010**	**mg/L**	1	22-Jul-2020 21:39
Bis(2-ethylhexyl)phthalate	**0.00016**	J	**0.000037**	**0.00020**	**mg/L**	1	22-Jul-2020 21:39
Dibenzofuran	**0.0067**		**0.000020**	**0.00010**	**mg/L**	1	22-Jul-2020 21:39
Di-n-butyl phthalate	**0.000065**	J	**0.000020**	**0.00020**	**mg/L**	1	22-Jul-2020 21:39
Fluoranthene	**0.0015**		**0.000010**	**0.00010**	**mg/L**	1	22-Jul-2020 21:39
Fluorene	**0.014**		**0.00030**	**0.0010**	**mg/L**	10	24-Jul-2020 12:17
Naphthalene	**0.00066**		**0.000020**	**0.00010**	**mg/L**	1	22-Jul-2020 21:39
Phenol	U		0.000035	0.00020	mg/L	1	22-Jul-2020 21:39
Pyrene	**0.00069**		**0.000019**	**0.00010**	**mg/L**	1	22-Jul-2020 21:39
Surr: 2,4,6-Tribromophenol	*68.0*			*34-129*	*%REC*	*1*	*22-Jul-2020 21:39*
Surr: 2,4,6-Tribromophenol	*125*			*34-129*	*%REC*	*10*	*24-Jul-2020 12:17*
Surr: 2-Fluorobiphenyl	*73.2*			*40-125*	*%REC*	*10*	*24-Jul-2020 12:17*
Surr: 2-Fluorobiphenyl	*61.8*			*40-125*	*%REC*	*1*	*22-Jul-2020 21:39*
Surr: 2-Fluorophenol	*52.9*			*20-120*	*%REC*	*1*	*22-Jul-2020 21:39*
Surr: 2-Fluorophenol	*81.9*			*20-120*	*%REC*	*10*	*24-Jul-2020 12:17*
Surr: 4-Terphenyl-d14	*100*			*40-135*	*%REC*	*10*	*24-Jul-2020 12:17*
Surr: 4-Terphenyl-d14	*81.9*			*40-135*	*%REC*	*1*	*22-Jul-2020 21:39*
Surr: Nitrobenzene-d5	*48.0*			*41-120*	*%REC*	*1*	*22-Jul-2020 21:39*
Surr: Nitrobenzene-d5	*90.4*			*41-120*	*%REC*	*10*	*24-Jul-2020 12:17*
Surr: Phenol-d6	*101*			*20-120*	*%REC*	*10*	*24-Jul-2020 12:17*
Surr: Phenol-d6	*42.2*			*20-120*	*%REC*	*1*	*22-Jul-2020 21:39*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
ANALYTICAL REPORT
Project: Houston TX-Wood Preserving Works SWMU1 WorkOrder:HS20070658
Sample ID: WG-1620-MW11A-20200714 Lab ID:HS20070658-05
Collection Date: 14-Jul-2020 11:25 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3510 / 20-Jul-2020		Analyst: GEY
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	22-Jul-2020 21:59
Acenaphthene	U		0.000027	0.00010	mg/L	1	22-Jul-2020 21:59
Acenaphthylene	U		0.000015	0.00010	mg/L	1	22-Jul-2020 21:59
Anthracene	U		0.000014	0.00010	mg/L	1	22-Jul-2020 21:59
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	22-Jul-2020 21:59
Dibenzofuran	U		0.000020	0.00010	mg/L	1	22-Jul-2020 21:59
Fluoranthene	U		0.000010	0.00010	mg/L	1	22-Jul-2020 21:59
Fluorene	U		0.000030	0.00010	mg/L	1	22-Jul-2020 21:59
Naphthalene	U		0.000020	0.00010	mg/L	1	22-Jul-2020 21:59
Phenanthrene	U		0.000021	0.00010	mg/L	1	22-Jul-2020 21:59
Pyrene	U		0.000019	0.00010	mg/L	1	22-Jul-2020 21:59
Surr: 2,4,6-Tribromophenol	*50.0*			*34-129*	*%REC*	*1*	*22-Jul-2020 21:59*
Surr: 2-Fluorobiphenyl	*59.3*			*40-125*	*%REC*	*1*	*22-Jul-2020 21:59*
Surr: 2-Fluorophenol	*52.7*			*20-120*	*%REC*	*1*	*22-Jul-2020 21:59*
Surr: 4-Terphenyl-d14	*87.2*			*40-135*	*%REC*	*1*	*22-Jul-2020 21:59*
Surr: Nitrobenzene-d5	*48.5*			*41-120*	*%REC*	*1*	*22-Jul-2020 21:59*
Surr: Phenol-d6	*46.9*			*20-120*	*%REC*	*1*	*22-Jul-2020 21:59*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
ANALYTICAL REPORT
Project: Houston TX-Wood Preserving Works SWMU1 WorkOrder:HS20070658
Sample ID: WG-1620-MW11B-20200714 Lab ID:HS20070658-06
Collection Date: 14-Jul-2020 12:15 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3510 / 20-Jul-2020		Analyst: GEY
Acenaphthene	**0.067**		**0.00027**	**0.0010**	**mg/L**	10	24-Jul-2020 12:36
Acenaphthylene	**0.00094**		**0.000015**	**0.00010**	**mg/L**	1	22-Jul-2020 22:19
Anthracene	**0.0037**		**0.000014**	**0.00010**	**mg/L**	1	22-Jul-2020 22:19
Bis(2-ethylhexyl)phthalate	**0.000064**	J	**0.000037**	**0.00020**	**mg/L**	1	22-Jul-2020 22:19
Dibenzofuran	**0.024**		**0.00020**	**0.0010**	**mg/L**	10	24-Jul-2020 12:36
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	22-Jul-2020 22:19
Fluoranthene	**0.0045**		**0.000010**	**0.00010**	**mg/L**	1	22-Jul-2020 22:19
Fluorene	**0.035**		**0.00030**	**0.0010**	**mg/L**	10	24-Jul-2020 12:36
Naphthalene	**0.30**		**0.0020**	**0.010**	**mg/L**	100	24-Jul-2020 12:56
Phenol	U		0.000035	0.00020	mg/L	1	22-Jul-2020 22:19
Pyrene	**0.0027**		**0.000019**	**0.00010**	**mg/L**	1	22-Jul-2020 22:19
Surr: 2,4,6-Tribromophenol	*80.6*			*34-129*	*%REC*	*10*	*24-Jul-2020 12:36*
Surr: 2,4,6-Tribromophenol	*0*	*JS*		*34-129*	*%REC*	*100*	*24-Jul-2020 12:56*
Surr: 2,4,6-Tribromophenol	*62.0*			*34-129*	*%REC*	*1*	*22-Jul-2020 22:19*
Surr: 2-Fluorobiphenyl	*45.5*			*40-125*	*%REC*	*1*	*22-Jul-2020 22:19*
Surr: 2-Fluorobiphenyl	*43.4*			*40-125*	*%REC*	*10*	*24-Jul-2020 12:36*
Surr: 2-Fluorobiphenyl	*0*	*JS*		*40-125*	*%REC*	*100*	*24-Jul-2020 12:56*
Surr: 2-Fluorophenol	*45.0*			*20-120*	*%REC*	*10*	*24-Jul-2020 12:36*
Surr: 2-Fluorophenol	*0*	*JS*		*20-120*	*%REC*	*100*	*24-Jul-2020 12:56*
Surr: 2-Fluorophenol	*37.8*			*20-120*	*%REC*	*1*	*22-Jul-2020 22:19*
Surr: 4-Terphenyl-d14	*82.1*			*40-135*	*%REC*	*1*	*22-Jul-2020 22:19*
Surr: 4-Terphenyl-d14	*100*			*40-135*	*%REC*	*10*	*24-Jul-2020 12:36*
Surr: 4-Terphenyl-d14	*0*	*JS*		*40-135*	*%REC*	*100*	*24-Jul-2020 12:56*
Surr: Nitrobenzene-d5	*46.6*			*41-120*	*%REC*	*1*	*22-Jul-2020 22:19*
Surr: Nitrobenzene-d5	*58.0*			*41-120*	*%REC*	*10*	*24-Jul-2020 12:36*
Surr: Nitrobenzene-d5	*0*	*JS*		*41-120*	*%REC*	*100*	*24-Jul-2020 12:56*
Surr: Phenol-d6	*63.1*			*20-120*	*%REC*	*10*	*24-Jul-2020 12:36*
Surr: Phenol-d6	*0*	*JS*		*20-120*	*%REC*	*100*	*24-Jul-2020 12:56*
Surr: Phenol-d6	*44.6*			*20-120*	*%REC*	*1*	*22-Jul-2020 22:19*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
ANALYTICAL REPORT
Project: Houston TX-Wood Preserving Works SWMU1 WorkOrder:HS20070658
Sample ID: WG-1620-MW08-20200714 Lab ID:HS20070658-07
Collection Date: 14-Jul-2020 13:15 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3510 / 20-Jul-2020		Analyst: GEY
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	20-Jul-2020 17:05
Acenaphthene	U		0.000027	0.00010	mg/L	1	20-Jul-2020 17:05
Acenaphthylene	U		0.000015	0.00010	mg/L	1	20-Jul-2020 17:05
Anthracene	U		0.000014	0.00010	mg/L	1	20-Jul-2020 17:05
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	20-Jul-2020 17:05
Dibenzofuran	U		0.000020	0.00010	mg/L	1	20-Jul-2020 17:05
Fluoranthene	U		0.000010	0.00010	mg/L	1	20-Jul-2020 17:05
Fluorene	U		0.000030	0.00010	mg/L	1	20-Jul-2020 17:05
Naphthalene	U		0.000020	0.00010	mg/L	1	20-Jul-2020 17:05
Phenanthrene	U		0.000021	0.00010	mg/L	1	20-Jul-2020 17:05
Pyrene	U		0.000019	0.00010	mg/L	1	20-Jul-2020 17:05
Surr: 2,4,6-Tribromophenol	*64.7*			*34-129*	*%REC*	*1*	*20-Jul-2020 17:05*
Surr: 2-Fluorobiphenyl	*46.5*			*40-125*	*%REC*	*1*	*20-Jul-2020 17:05*
Surr: 2-Fluorophenol	*46.6*			*20-120*	*%REC*	*1*	*20-Jul-2020 17:05*
Surr: 4-Terphenyl-d14	*72.6*			*40-135*	*%REC*	*1*	*20-Jul-2020 17:05*
Surr: Nitrobenzene-d5	*45.8*			*41-120*	*%REC*	*1*	*20-Jul-2020 17:05*
Surr: Phenol-d6	*51.2*			*20-120*	*%REC*	*1*	*20-Jul-2020 17:05*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
ANALYTICAL REPORT
Project: Houston TX-Wood Preserving Works SWMU1 WorkOrder:HS20070658
Sample ID: WG-1620-MW07-20200714 Lab ID:HS20070658-08
Collection Date: 14-Jul-2020 14:15 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3510 / 20-Jul-2020		Analyst: GEY
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	20-Jul-2020 17:24
Acenaphthene	U		0.000027	0.00010	mg/L	1	20-Jul-2020 17:24
Acenaphthylene	U		0.000015	0.00010	mg/L	1	20-Jul-2020 17:24
Anthracene	U		0.000014	0.00010	mg/L	1	20-Jul-2020 17:24
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	20-Jul-2020 17:24
Dibenzofuran	U		0.000020	0.00010	mg/L	1	20-Jul-2020 17:24
Fluoranthene	U		0.000010	0.00010	mg/L	1	20-Jul-2020 17:24
Fluorene	U		0.000030	0.00010	mg/L	1	20-Jul-2020 17:24
Naphthalene	**0.00012**		**0.000020**	**0.00010**	**mg/L**	1	20-Jul-2020 17:24
Phenanthrene	U		0.000021	0.00010	mg/L	1	20-Jul-2020 17:24
Pyrene	U		0.000019	0.00010	mg/L	1	20-Jul-2020 17:24
Surr: 2,4,6-Tribromophenol	*70.5*			*34-129*	*%REC*	*1*	*20-Jul-2020 17:24*
Surr: 2-Fluorobiphenyl	*58.2*			*40-125*	*%REC*	*1*	*20-Jul-2020 17:24*
Surr: 2-Fluorophenol	*49.1*			*20-120*	*%REC*	*1*	*20-Jul-2020 17:24*
Surr: 4-Terphenyl-d14	*80.1*			*40-135*	*%REC*	*1*	*20-Jul-2020 17:24*
Surr: Nitrobenzene-d5	*58.6*			*41-120*	*%REC*	*1*	*20-Jul-2020 17:24*
Surr: Phenol-d6	*54.6*			*20-120*	*%REC*	*1*	*20-Jul-2020 17:24*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
ANALYTICAL REPORT
Project: Houston TX-Wood Preserving Works SWMU1 WorkOrder:HS20070658
Sample ID: WG-1620-P10-20200714 Lab ID:HS20070658-09
Collection Date: 14-Jul-2020 15:20 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3510 / 20-Jul-2020		Analyst: GEY
Acenaphthene	**0.00018**		**0.000027**	**0.00010**	**mg/L**	1	20-Jul-2020 17:43
Acenaphthylene	U		0.000015	0.00010	mg/L	1	20-Jul-2020 17:43
Anthracene	U		0.000014	0.00010	mg/L	1	20-Jul-2020 17:43
Bis(2-ethylhexyl)phthalate	**0.00010**	J	**0.000037**	**0.00020**	**mg/L**	1	20-Jul-2020 17:43
Dibenzofuran	U		0.000020	0.00010	mg/L	1	20-Jul-2020 17:43
Di-n-butyl phthalate	**0.000032**	J	**0.000020**	**0.00020**	**mg/L**	1	20-Jul-2020 17:43
Fluoranthene	**0.000045**	J	**0.000010**	**0.00010**	**mg/L**	1	20-Jul-2020 17:43
Fluorene	**0.00012**		**0.000030**	**0.00010**	**mg/L**	1	20-Jul-2020 17:43
Naphthalene	U		0.000020	0.00010	mg/L	1	20-Jul-2020 17:43
Phenol	U		0.000035	0.00020	mg/L	1	20-Jul-2020 17:43
Pyrene	**0.000068**	J	**0.000019**	**0.00010**	**mg/L**	1	20-Jul-2020 17:43
Surr: 2,4,6-Tribromophenol	*80.9*			*34-129*	*%REC*	*1*	*20-Jul-2020 17:43*
Surr: 2-Fluorobiphenyl	*60.2*			*40-125*	*%REC*	*1*	*20-Jul-2020 17:43*
Surr: 2-Fluorophenol	*54.8*			*20-120*	*%REC*	*1*	*20-Jul-2020 17:43*
Surr: 4-Terphenyl-d14	*87.1*			*40-135*	*%REC*	*1*	*20-Jul-2020 17:43*
Surr: Nitrobenzene-d5	*54.6*			*41-120*	*%REC*	*1*	*20-Jul-2020 17:43*
Surr: Phenol-d6	*58.8*			*20-120*	*%REC*	*1*	*20-Jul-2020 17:43*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
ANALYTICAL REPORT
Project: Houston TX-Wood Preserving Works SWMU1 WorkOrder:HS20070658
Sample ID: WG-1620-DUP01-20200714 Lab ID:HS20070658-10
Collection Date: 14-Jul-2020 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3510 / 20-Jul-2020		Analyst: GEY
2-Methylnaphthalene	**0.0015**		**0.000019**	**0.00010**	**mg/L**	1	22-Jul-2020 22:38
Acenaphthene	**0.044**		**0.00027**	**0.0010**	**mg/L**	10	24-Jul-2020 13:16
Acenaphthylene	**0.00081**		**0.000015**	**0.00010**	**mg/L**	1	22-Jul-2020 22:38
Anthracene	**0.0016**		**0.000014**	**0.00010**	**mg/L**	1	22-Jul-2020 22:38
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	22-Jul-2020 22:38
Dibenzofuran	**0.0090**		**0.000020**	**0.00010**	**mg/L**	1	22-Jul-2020 22:38
Fluoranthene	**0.0035**		**0.000010**	**0.00010**	**mg/L**	1	22-Jul-2020 22:38
Fluorene	**0.018**		**0.00030**	**0.0010**	**mg/L**	10	24-Jul-2020 13:16
Naphthalene	**0.0052**		**0.000020**	**0.00010**	**mg/L**	1	22-Jul-2020 22:38
Phenanthrene	**0.0029**		**0.000021**	**0.00010**	**mg/L**	1	22-Jul-2020 22:38
Pyrene	**0.0017**		**0.000019**	**0.00010**	**mg/L**	1	22-Jul-2020 22:38
Surr: 2,4,6-Tribromophenol	*93.4*			*34-129*	*%REC*	*1*	*22-Jul-2020 22:38*
Surr: 2,4,6-Tribromophenol	*60.8*			*34-129*	*%REC*	*10*	*24-Jul-2020 13:16*
Surr: 2-Fluorobiphenyl	*41.4*			*40-125*	*%REC*	*10*	*24-Jul-2020 13:16*
Surr: 2-Fluorobiphenyl	*58.9*			*40-125*	*%REC*	*1*	*22-Jul-2020 22:38*
Surr: 2-Fluorophenol	*41.2*			*20-120*	*%REC*	*1*	*22-Jul-2020 22:38*
Surr: 2-Fluorophenol	*41.9*			*20-120*	*%REC*	*10*	*24-Jul-2020 13:16*
Surr: 4-Terphenyl-d14	*89.0*			*40-135*	*%REC*	*10*	*24-Jul-2020 13:16*
Surr: 4-Terphenyl-d14	*77.8*			*40-135*	*%REC*	*1*	*22-Jul-2020 22:38*
Surr: Nitrobenzene-d5	*49.4*			*41-120*	*%REC*	*1*	*22-Jul-2020 22:38*
Surr: Nitrobenzene-d5	*65.8*			*41-120*	*%REC*	*10*	*24-Jul-2020 13:16*
Surr: Phenol-d6	*59.9*			*20-120*	*%REC*	*10*	*24-Jul-2020 13:16*
Surr: Phenol-d6	*44.1*			*20-120*	*%REC*	*1*	*22-Jul-2020 22:38*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
ANALYTICAL REPORT
Project: Houston TX-Wood Preserving Works SWMU1 WorkOrder:HS20070658
Sample ID: WG-1620-DUP02-20200714 Lab ID:HS20070658-11
Collection Date: 14-Jul-2020 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3510 / 20-Jul-2020		Analyst: GEY
Acenaphthene	U		0.000027	0.00010	mg/L	1	20-Jul-2020 18:21
Acenaphthylene	U		0.000015	0.00010	mg/L	1	20-Jul-2020 18:21
Anthracene	U		0.000014	0.00010	mg/L	1	20-Jul-2020 18:21
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	20-Jul-2020 18:21
Dibenzofuran	U		0.000020	0.00010	mg/L	1	20-Jul-2020 18:21
Di-n-butyl phthalate	**0.000025**	J	**0.000020**	**0.00020**	**mg/L**	1	20-Jul-2020 18:21
Fluoranthene	**0.000050**	J	**0.000010**	**0.00010**	**mg/L**	1	20-Jul-2020 18:21
Fluorene	U		0.000030	0.00010	mg/L	1	20-Jul-2020 18:21
Naphthalene	U		0.000020	0.00010	mg/L	1	20-Jul-2020 18:21
Phenol	U		0.000035	0.00020	mg/L	1	20-Jul-2020 18:21
Pyrene	**0.000060**	J	**0.000019**	**0.00010**	**mg/L**	1	20-Jul-2020 18:21
Surr: 2,4,6-Tribromophenol	*76.0*			*34-129*	*%REC*	*1*	*20-Jul-2020 18:21*
Surr: 2-Fluorobiphenyl	*59.3*			*40-125*	*%REC*	*1*	*20-Jul-2020 18:21*
Surr: 2-Fluorophenol	*52.8*			*20-120*	*%REC*	*1*	*20-Jul-2020 18:21*
Surr: 4-Terphenyl-d14	*76.1*			*40-135*	*%REC*	*1*	*20-Jul-2020 18:21*
Surr: Nitrobenzene-d5	*52.5*			*41-120*	*%REC*	*1*	*20-Jul-2020 18:21*
Surr: Phenol-d6	*61.2*			*20-120*	*%REC*	*1*	*20-Jul-2020 18:21*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
ANALYTICAL REPORT
Project: Houston TX-Wood Preserving Works SWMU1 WorkOrder:HS20070658
Sample ID: WG-1620-FB01-20200714 Lab ID:HS20070658-12
Collection Date: 14-Jul-2020 16:00 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3510 / 20-Jul-2020		Analyst: GEY
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	22-Jul-2020 23:57
Acenaphthene	U		0.000027	0.00010	mg/L	1	22-Jul-2020 23:57
Acenaphthylene	U		0.000015	0.00010	mg/L	1	22-Jul-2020 23:57
Anthracene	U		0.000014	0.00010	mg/L	1	22-Jul-2020 23:57
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	22-Jul-2020 23:57
Dibenzofuran	**0.000060**	J	**0.000020**	**0.00010**	**mg/L**	1	22-Jul-2020 23:57
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	22-Jul-2020 23:57
Fluoranthene	U		0.000010	0.00010	mg/L	1	22-Jul-2020 23:57
Fluorene	U		0.000030	0.00010	mg/L	1	22-Jul-2020 23:57
Naphthalene	**0.00028**		**0.000020**	**0.00010**	**mg/L**	1	22-Jul-2020 23:57
Phenanthrene	U		0.000021	0.00010	mg/L	1	22-Jul-2020 23:57
Phenol	U		0.000035	0.00020	mg/L	1	22-Jul-2020 23:57
Pyrene	U		0.000019	0.00010	mg/L	1	22-Jul-2020 23:57
Surr: 2,4,6-Tribromophenol	*55.0*			*34-129*	*%REC*	*1*	*22-Jul-2020 23:57*
Surr: 2-Fluorobiphenyl	*79.0*			*40-125*	*%REC*	*1*	*22-Jul-2020 23:57*
Surr: 2-Fluorophenol	*72.6*			*20-120*	*%REC*	*1*	*22-Jul-2020 23:57*
Surr: 4-Terphenyl-d14	*82.7*			*40-135*	*%REC*	*1*	*22-Jul-2020 23:57*
Surr: Nitrobenzene-d5	*55.2*			*41-120*	*%REC*	*1*	*22-Jul-2020 23:57*
Surr: Phenol-d6	*62.7*			*20-120*	*%REC*	*1*	*22-Jul-2020 23:57*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
ANALYTICAL REPORT
Project: Houston TX-Wood Preserving Works SWMU1 WorkOrder:HS20070658
Sample ID: WG-1620-P12-20200715 Lab ID:HS20070658-13
Collection Date: 15-Jul-2020 08:30 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3510 / 20-Jul-2020		Analyst: GEY
Acenaphthene	U		0.000027	0.00010	mg/L	1	23-Jul-2020 00:17
Acenaphthylene	U		0.000015	0.00010	mg/L	1	23-Jul-2020 00:17
Anthracene	U		0.000014	0.00010	mg/L	1	23-Jul-2020 00:17
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	23-Jul-2020 00:17
Dibenzofuran	U		0.000020	0.00010	mg/L	1	23-Jul-2020 00:17
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	23-Jul-2020 00:17
Fluoranthene	U		0.000010	0.00010	mg/L	1	23-Jul-2020 00:17
Fluorene	U		0.000030	0.00010	mg/L	1	23-Jul-2020 00:17
Naphthalene	U		0.000020	0.00010	mg/L	1	23-Jul-2020 00:17
Phenol	U		0.000035	0.00020	mg/L	1	23-Jul-2020 00:17
Pyrene	U		0.000019	0.00010	mg/L	1	23-Jul-2020 00:17
Surr: 2,4,6-Tribromophenol	*55.9*			*34-129*	*%REC*	*1*	*23-Jul-2020 00:17*
Surr: 2-Fluorobiphenyl	*46.6*			*40-125*	*%REC*	*1*	*23-Jul-2020 00:17*
Surr: 2-Fluorophenol	*33.9*			*20-120*	*%REC*	*1*	*23-Jul-2020 00:17*
Surr: 4-Terphenyl-d14	*78.8*			*40-135*	*%REC*	*1*	*23-Jul-2020 00:17*
Surr: Nitrobenzene-d5	*46.9*			*41-120*	*%REC*	*1*	*23-Jul-2020 00:17*
Surr: Phenol-d6	*39.0*			*20-120*	*%REC*	*1*	*23-Jul-2020 00:17*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
ANALYTICAL REPORT
Project: Houston TX-Wood Preserving Works SWMU1 WorkOrder:HS20070658
Sample ID: WG-1620-FB02-20200715 Lab ID:HS20070658-14
Collection Date: 15-Jul-2020 09:30 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3510 / 20-Jul-2020		Analyst: GEY
2-Methylnaphthalene		U	0.000019	0.00010	mg/L	1	20-Jul-2020 19:56
Acenaphthene		U	0.000027	0.00010	mg/L	1	20-Jul-2020 19:56
Acenaphthylene		U	0.000015	0.00010	mg/L	1	20-Jul-2020 19:56
Anthracene		U	0.000014	0.00010	mg/L	1	20-Jul-2020 19:56
Bis(2-ethylhexyl)phthalate		U	0.000037	0.00020	mg/L	1	20-Jul-2020 19:56
Dibenzofuran		U	0.000020	0.00010	mg/L	1	20-Jul-2020 19:56
Di-n-butyl phthalate		U	0.000020	0.00020	mg/L	1	20-Jul-2020 19:56
Fluoranthene		U	0.000010	0.00010	mg/L	1	20-Jul-2020 19:56
Fluorene		U	0.000030	0.00010	mg/L	1	20-Jul-2020 19:56
Naphthalene		U	0.000020	0.00010	mg/L	1	20-Jul-2020 19:56
Phenanthrene		U	0.000021	0.00010	mg/L	1	20-Jul-2020 19:56
Phenol		U	0.000035	0.00020	mg/L	1	20-Jul-2020 19:56
Pyrene		U	0.000019	0.00010	mg/L	1	20-Jul-2020 19:56
Surr: 2,4,6-Tribromophenol	*67.8*			*34-129*	*%REC*	*1*	*20-Jul-2020 19:56*
Surr: 2-Fluorobiphenyl	*69.3*			*40-125*	*%REC*	*1*	*20-Jul-2020 19:56*
Surr: 2-Fluorophenol	*54.7*			*20-120*	*%REC*	*1*	*20-Jul-2020 19:56*
Surr: 4-Terphenyl-d14	*84.2*			*40-135*	*%REC*	*1*	*20-Jul-2020 19:56*
Surr: Nitrobenzene-d5	*59.2*			*41-120*	*%REC*	*1*	*20-Jul-2020 19:56*
Surr: Phenol-d6	*65.5*			*20-120*	*%REC*	*1*	*20-Jul-2020 19:56*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Weight / Prep Log

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works SWMU1
WorkOrder: HS20070658

Batch ID: 155547 **Start Date:** 20 Jul 2020 07:00 **End Date:** 20 Jul 2020 12:30
Method: SV AQ SEP FUN EXTRACT-LOWLEV - 3510C **Prep Code:** 3510_B_LOW

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20070658-01	1	1000 (mL)	1 (mL)	0.001
HS20070658-02	1	1000 (mL)	1 (mL)	0.001
HS20070658-03	1	1000 (mL)	1 (mL)	0.001
HS20070658-04	1	1000 (mL)	1 (mL)	0.001
HS20070658-05	1	1000 (mL)	1 (mL)	0.001
HS20070658-06	1	1000 (mL)	1 (mL)	0.001
HS20070658-07	1	1000 (mL)	1 (mL)	0.001
HS20070658-08	1	1000 (mL)	1 (mL)	0.001
HS20070658-09	1	1000 (mL)	1 (mL)	0.001
HS20070658-10	1	1000 (mL)	1 (mL)	0.001
HS20070658-11	1	1000 (mL)	1 (mL)	0.001
HS20070658-12	1	1000 (mL)	1 (mL)	0.001
HS20070658-13	1	1000 (mL)	1 (mL)	0.001
HS20070658-14	1	1000 (mL)	1 (mL)	0.001

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works SWMU1
WorkOrder: HS20070658

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 155547 (0)	**Test Name :** LOW-LEVEL SEMIVOLATILES BY 8270D				**Matrix:** Water	
HS20070658-01	WG-1620-MW01A-20200714	14 Jul 2020 08:40		20 Jul 2020 11:28	20 Jul 2020 20:53	10
HS20070658-01	WG-1620-MW01A-20200714	14 Jul 2020 08:40		20 Jul 2020 11:28	20 Jul 2020 20:34	1
HS20070658-02	WG-1620-MW02-20200714	14 Jul 2020 09:25		20 Jul 2020 11:28	20 Jul 2020 14:47	1
HS20070658-03	WG-1620-MW10A-20200714	14 Jul 2020 10:15		20 Jul 2020 11:28	20 Jul 2020 20:15	1
HS20070658-04	WG-1620-MW10B-20200714	14 Jul 2020 10:50		20 Jul 2020 11:28	24 Jul 2020 12:17	10
HS20070658-04	WG-1620-MW10B-20200714	14 Jul 2020 10:50		20 Jul 2020 11:28	22 Jul 2020 21:39	1
HS20070658-05	WG-1620-MW11A-20200714	14 Jul 2020 11:25		20 Jul 2020 11:28	22 Jul 2020 21:59	1
HS20070658-06	WG-1620-MW11B-20200714	14 Jul 2020 12:15		20 Jul 2020 11:28	24 Jul 2020 12:56	100
HS20070658-06	WG-1620-MW11B-20200714	14 Jul 2020 12:15		20 Jul 2020 11:28	24 Jul 2020 12:36	10
HS20070658-06	WG-1620-MW11B-20200714	14 Jul 2020 12:15		20 Jul 2020 11:28	22 Jul 2020 22:19	1
HS20070658-07	WG-1620-MW08-20200714	14 Jul 2020 13:15		20 Jul 2020 11:28	20 Jul 2020 17:05	1
HS20070658-08	WG-1620-MW07-20200714	14 Jul 2020 14:15		20 Jul 2020 11:28	20 Jul 2020 17:24	1
HS20070658-09	WG-1620-P10-20200714	14 Jul 2020 15:20		20 Jul 2020 11:28	20 Jul 2020 17:43	1
HS20070658-10	WG-1620-DUP01-20200714	14 Jul 2020 00:00		20 Jul 2020 11:28	24 Jul 2020 13:16	10
HS20070658-10	WG-1620-DUP01-20200714	14 Jul 2020 00:00		20 Jul 2020 11:28	22 Jul 2020 22:38	1
HS20070658-11	WG-1620-DUP02-20200714	14 Jul 2020 00:00		20 Jul 2020 11:28	20 Jul 2020 18:21	1
HS20070658-12	WG-1620-FB01-20200714	14 Jul 2020 16:00		20 Jul 2020 11:28	22 Jul 2020 23:57	1
HS20070658-13	WG-1620-P12-20200715	15 Jul 2020 08:30		20 Jul 2020 11:28	23 Jul 2020 00:17	1
HS20070658-14	WG-1620-FB02-20200715	15 Jul 2020 09:30		20 Jul 2020 11:28	20 Jul 2020 19:56	1

WorkOrder: HS20070658
InstrumentID: SV-7
Test Code: 8270_LOW_W
Test Number: SW8270
Test Name: Low-Level Semivolatiles by 8270D

METHOD DETECTION / REPORTING LIMITS

Matrix: Aqueous **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	2-Methylnaphthalene	91-57-6	0.000050	0.000040	0.000019	0.00010
A	Acenaphthene	83-32-9	0.000050	0.000045	0.000027	0.00010
A	Acenaphthylene	208-96-8	0.000050	0.000039	0.000015	0.00010
A	Anthracene	120-12-7	0.000050	0.000040	0.000014	0.00010
A	Bis(2-ethylhexyl)phthalate	117-81-7	0.00010	0.000072	0.000037	0.00020
A	Dibenzofuran	132-64-9	0.000050	0.000045	0.000020	0.00010
A	Di-n-butyl phthalate	84-74-2	0.00010	0.000073	0.000020	0.00020
A	Fluoranthene	206-44-0	0.000050	0.000033	0.000010	0.00010
A	Fluorene	86-73-7	0.000050	0.000045	0.000030	0.00010
A	Naphthalene	91-20-3	0.000050	0.000066	0.000020	0.00010
A	Phenanthrene	85-01-8	0.000050	0.000042	0.000021	0.00010
A	Phenol	108-95-2	0.00010	0.000090	0.000035	0.00020
A	Pyrene	129-00-0	0.000050	0.000044	0.000019	0.00010
S	2,4,6-Tribromophenol	118-79-6	0	0	0	0.00020
S	2-Fluorobiphenyl	321-60-8	0	0	0	0.00020
S	2-Fluorophenol	367-12-4	0	0	0	0.00020
S	4-Terphenyl-d14	1718-51-0	0	0	0	0.00020
S	Nitrobenzene-d5	4165-60-0	0	0	0	0.00020
S	Phenol-d6	13127-88-3	0	0	0	0.00020

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works SWMU1
WorkOrder: HS20070658

QC BATCH REPORT

Batch ID: 155547 (0) **Instrument: SV-7** **Method: LOW-LEVEL SEMIVOLATILES BY 8270D**

MBLK Sample ID: **MBLK-155547** Units: **ug/L** Analysis Date: **20-Jul-2020 13:50**
Client ID: Run ID: **SV-7_365364** SeqNo: **5668015** PrepDate: **20-Jul-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	U	0.10								
Acenaphthene	U	0.10								
Acenaphthylene	U	0.10								
Anthracene	U	0.10								
Bis(2-ethylhexyl)phthalate	U	0.20								
Dibenzofuran	U	0.10								
Di-n-butyl phthalate	U	0.20								
Fluoranthene	U	0.10								
Fluorene	U	0.10								
Naphthalene	U	0.10								
Phenanthrene	U	0.10								
Phenol	U	0.20								
Pyrene	U	0.10								
Surr: 2,4,6-Tribromophenol	*3.103*	*0.20*	*5*	*0*	*62.1*	*34 - 129*				
Surr: 2-Fluorobiphenyl	*3.506*	*0.20*	*5*	*0*	*70.1*	*40 - 125*				
Surr: 2-Fluorophenol	*3.547*	*0.20*	*5*	*0*	*70.9*	*20 - 120*				
Surr: 4-Terphenyl-d14	*4.607*	*0.20*	*5*	*0*	*92.1*	*40 - 135*				
Surr: Nitrobenzene-d5	*3.696*	*0.20*	*5*	*0*	*73.9*	*41 - 120*				
Surr: Phenol-d6	*4.108*	*0.20*	*5*	*0*	*82.2*	*20 - 120*				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works SWMU1
WorkOrder: HS20070658

QC BATCH REPORT

Batch ID: 155547 (0) **Instrument: SV-7** **Method: LOW-LEVEL SEMIVOLATILES BY 8270D**

LCS Sample ID: **LCS-155547** Units: **ug/L** Analysis Date: **20-Jul-2020 15:11**
Client ID: Run ID: **SV-7_365364** SeqNo: **5668017** PrepDate: **20-Jul-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	2.822	0.10	5	0	56.4	50 - 120				
Acenaphthene	3.315	0.10	5	0	66.3	45 - 120				
Acenaphthylene	3.682	0.10	5	0	73.6	47 - 120				
Anthracene	4.019	0.10	5	0	80.4	45 - 120				
Bis(2-ethylhexyl)phthalate	5.115	0.20	5	0	102	40 - 139				
Dibenzofuran	3.619	0.10	5	0	72.4	50 - 120				
Di-n-butyl phthalate	4.658	0.20	5	0	93.2	45 - 123				
Fluoranthene	4.467	0.10	5	0	89.3	45 - 125				
Fluorene	3.884	0.10	5	0	77.7	49 - 120				
Naphthalene	3.599	0.10	5	0	72.0	45 - 120				
Phenanthrene	4.035	0.10	5	0	80.7	45 - 121				
Phenol	3.713	0.20	5	0	74.3	20 - 124				
Pyrene	4.262	0.10	5	0	85.2	40 - 130				
Surr: 2,4,6-Tribromophenol	*4.567*	*0.20*	*5*	*0*	*91.3*	*34 - 129*				
Surr: 2-Fluorobiphenyl	*3.532*	*0.20*	*5*	*0*	*70.6*	*40 - 125*				
Surr: 2-Fluorophenol	*3.567*	*0.20*	*5*	*0*	*71.3*	*20 - 120*				
Surr: 4-Terphenyl-d14	*4.594*	*0.20*	*5*	*0*	*91.9*	*40 - 135*				
Surr: Nitrobenzene-d5	*3.79*	*0.20*	*5*	*0*	*75.8*	*41 - 120*				
Surr: Phenol-d6	*3.979*	*0.20*	*5*	*0*	*79.6*	*20 - 120*				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works SWMU1
WorkOrder: HS20070658

QC BATCH REPORT

Batch ID: 155547 (0) **Instrument: SV-7** **Method: LOW-LEVEL SEMIVOLATILES BY 8270D**

MS Sample ID: **HS20070658-13MS** Units: **ug/L** Analysis Date: **20-Jul-2020 19:18**
Client ID: **WG-1620-P12-20200715** Run ID: **SV-7_365364** SeqNo: **5668022** PrepDate: **20-Jul-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	3.153	0.10	5	0	63.1	50 - 120				
Acenaphthene	2.947	0.10	5	0	58.9	45 - 120				
Acenaphthylene	3.282	0.10	5	0	65.6	47 - 120				
Anthracene	3.665	0.10	5	0	73.3	45 - 120				
Bis(2-ethylhexyl)phthalate	4.59	0.20	5	0	91.8	40 - 139				
Dibenzofuran	3.246	0.10	5	0	64.9	50 - 120				
Di-n-butyl phthalate	4.268	0.20	5	0	85.4	45 - 123				
Fluoranthene	4.311	0.10	5	0	86.2	45 - 125				
Fluorene	3.474	0.10	5	0	69.5	49 - 120				
Naphthalene	3.07	0.10	5	0	61.4	45 - 120				
Phenanthrene	3.747	0.10	5	0	74.9	45 - 121				
Phenol	2.853	0.20	5	0	57.1	20 - 124				
Pyrene	3.863	0.10	5	0	77.3	40 - 130				
Surr: 2,4,6-Tribromophenol	*4.187*	*0.20*	*5*	*0*	*83.7*	*34 - 129*				
Surr: 2-Fluorobiphenyl	*3.121*	*0.20*	*5*	*0*	*62.4*	*40 - 125*				
Surr: 2-Fluorophenol	*2.793*	*0.20*	*5*	*0*	*55.9*	*20 - 120*				
Surr: 4-Terphenyl-d14	*4.106*	*0.20*	*5*	*0*	*82.1*	*40 - 135*				
Surr: Nitrobenzene-d5	*2.825*	*0.20*	*5*	*0*	*56.5*	*41 - 120*				
Surr: Phenol-d6	*3.132*	*0.20*	*5*	*0*	*62.6*	*20 - 120*				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works SWMU1
WorkOrder: HS20070658

QC BATCH REPORT

Batch ID: 155547 (0) **Instrument: SV-7** **Method: LOW-LEVEL SEMIVOLATILES BY 8270D**

MSD Sample ID: **HS20070658-13MSD** Units: **ug/L** Analysis Date: **20-Jul-2020 19:37**
Client ID: **WG-1620-P12-20200715** Run ID: **SV-7_365364** SeqNo: **5668023** PrepDate: **20-Jul-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
2-Methylnaphthalene	2.824	0.10	5	0	56.5	50 - 120	3.153	11	20	
Acenaphthene	2.77	0.10	5	0	55.4	45 - 120	2.947	6.19	20	
Acenaphthylene	2.996	0.10	5	0	59.9	47 - 120	3.282	9.11	20	
Anthracene	3.494	0.10	5	0	69.9	45 - 120	3.665	4.79	20	
Bis(2-ethylhexyl)phthalate	4.632	0.20	5	0	92.6	40 - 139	4.59	0.916	20	
Dibenzofuran	3.069	0.10	5	0	61.4	50 - 120	3.246	5.62	20	
Di-n-butyl phthalate	3.896	0.20	5	0	77.9	45 - 123	4.268	9.1	20	
Fluoranthene	3.867	0.10	5	0	77.3	45 - 125	4.311	10.9	20	
Fluorene	3.3	0.10	5	0	66.0	49 - 120	3.474	5.14	20	
Naphthalene	2.842	0.10	5	0	56.8	45 - 120	3.07	7.71	20	
Phenanthrene	3.506	0.10	5	0	70.1	45 - 121	3.747	6.65	20	
Phenol	2.833	0.20	5	0	56.7	20 - 124	2.853	0.727	20	
Pyrene	3.964	0.10	5	0	79.3	40 - 130	3.863	2.59	20	
Surr: 2,4,6-Tribromophenol	*3.624*	*0.20*	*5*	*0*	*72.5*	*34 - 129*	*4.187*	*14.4*	*20*	
Surr: 2-Fluorobiphenyl	*2.715*	*0.20*	*5*	*0*	*54.3*	*40 - 125*	*3.121*	*13.9*	*20*	
Surr: 2-Fluorophenol	*2.687*	*0.20*	*5*	*0*	*53.7*	*20 - 120*	*2.793*	*3.87*	*20*	
Surr: 4-Terphenyl-d14	*3.842*	*0.20*	*5*	*0*	*76.8*	*40 - 135*	*4.106*	*6.65*	*20*	
Surr: Nitrobenzene-d5	*2.44*	*0.20*	*5*	*0*	*48.8*	*41 - 120*	*2.825*	*14.6*	*20*	
Surr: Phenol-d6	*3.07*	*0.20*	*5*	*0*	*61.4*	*20 - 120*	*3.132*	*2.01*	*20*	

The following samples were analyzed in this batch:

HS20070658-01	HS20070658-02	HS20070658-03	HS20070658-04
HS20070658-05	HS20070658-06	HS20070658-07	HS20070658-08
HS20070658-09	HS20070658-10	HS20070658-11	HS20070658-12
HS20070658-13	HS20070658-14		

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works SWMU1
WorkOrder: **HS20070658**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	20-030-0	26-Mar-2021
Dept of Defense	ANAB L2231 V009	22-Dec-2021
Illinois	2000322020-4	09-May-2021
Kansas	E-10352 2019-2020	31-Jul-2020
North Carolina	624-2020	31-Dec-2020
Oklahoma	2019-141	31-Aug-2020
Texas	T104704231-20-26	30-Apr-2021

Sample Receipt Checklist

Work Order ID: HS20070658 **Date/Time Received:** **15-Jul-2020 15:55**

Client Name: PBW **Received by:** **Paresh M. Giga**

Completed By:	/S/ Jared R. Makan	15-Jul-2020 19:10	**Reviewed by:**	/S/ Dane J. Wacasey	16-Jul-2020 19:26
	eSignature	Date/Time		eSignature	Date/Time

Matrices: **Water** Carrier name: **ALS Courier**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:227484, 227483
Samplers name present on COC?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.7°C, 3.6°C, 4.2°C, 3.9°C Corrected	IR25	
Cooler(s)/Kit(s):	45202, 45644, 45114, 43623		
Date/Time sample(s) sent to storage:	07/15/2020 19:15		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes: MW10B collection time differs: COC = 10:50; Labels = 10:30; logged in per COC.

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070

Chain of Custody Form

Page 1 of 2

COC ID: 227484

HS20070658

Golder Associates Inc.

Houston TX-Wood Preserving Works

ALS Project Manager:

Customer Information		Project Information	
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works
Work Order		Project Number	1620-19-Rev0 SR 92688 SWMU1
Company Name	Golder Associates	Bill To Company	Union Pacific Railroad- A/P
Send Report To	Eric Matzner	Invoice Attn	Accounts Payable
Address	2201 Double Creek Drive Suite 4004	Address	1400 Douglas Street Stop 0750
City/State/Zip	Round Rock, TX 78664	City/State/Zip	Omaha NE 681790750
Phone	(512) 671-3434	Phone	
Fax	(512) 671-3446	Fax	
e-Mail Address	eric_matzner@golder.com	e-Mail Address	

A	8270_LOW_W (5632532 ATZ SemiVolatiles)
B	8270_LOW_W (5632532 BTZ SemiVolatiles)
C	8270_LOW_W (5632532 ATZ & BTZ SemiVolatiles)
D	
E	
F	
G	
H	
I	
J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	WG-1620 MW 1A 20200714	7-14-20	8:40	Groundwa	8	2	X										
2	WG-1620 MW 02 20200714	7-14-20	9:25	W	8	2	X										
3	WG-1620 MW 10A 20200714	7-14-20	10:15	W	8		X										
4	WG-1620 MW 10B 20200714	7-14-20	10:50	W	8	2		X									
5	WG-1620 MW 11A 20200714	7-14-20	11:25	W	8	2	X										
6	WG-1620 MW 11B 20200714	7-14-20	12:15	W	8	2		X									
7	WG-1620 MW 08 20200714	7-14-20	13:15	W	8	2	X										
8	WG-1620 MW 07 20200714	7-14-20	14:15	W	8	2	X										
9	WG-1620 MW P10 20200714	7-14-20	15:20	W	8	2		X									
10	WG-1620 DUP 01 20200714	7-14-20	—	W	8	2	X										

Sampler(s) Please Print & Sign

Shipment Method: HAND DELIVERED

Required Turnaround Time: (Check Box) ☐ Other ____ ☒ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour

Results Due Date:

Relinquished by:	Date: 7-15-20	Time: 15:55	Received by:	
Relinquished by:	Date:	Time:	Received by (Laboratory): 7/15/2020 15:55	
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	

Notes: UPRR Houston MWPW

Cooler ID	Cooler Temp.
	6i.
43078	4.8°.
45114	4.2°.
45644	3.6°.
43490	4.4°.

QC Package: (Check One Box Below)

☐ Level II Std QC ☒ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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Holland, MI +1 616 399 6070

Chain of Custody Form

Page 2 of 2

COC ID: 227483

HS20070658

Golder Associates Inc.
Houston TX-Wood Preserving Works

ALS Project Manager:

Customer Information		Project Information			
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works	A	8270_LOW_W (5632532 ATZ SemiVolatiles)
Work Order		Project Number	1620-19-Rev0 SR 92688 SWMU1	B	8270_LOW_W (5632532 BTZ SemiVolatiles)
Company Name	Golder Associates	Bill To Company	Union Pacific Railroad- A/P	C	8270_LOW_W (5632532 ATZ & BTZ SemiVolatiles)
Send Report To	Eric Matzner	Invoice Attn	Accounts Payable	D	
Address	2201 Double Creek Drive Suite 4004	Address	1400 Douglas Street Stop 0750	E F	
City/State/Zip	Round Rock, TX 78664	City/State/Zip	Omaha NE 681790750	G	
Phone	(512) 671-3434	Phone		H	
Fax	(512) 671-3446	Fax		I	
e-Mail Address	eric_matzner@golder.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	WG1620 Dup 02 20200714	7-14-20	—	Groundwa	8	2		X									
2	WG1620 FB01 20200714	7-14-20	1600	W	8	2			X								
3	WG1620 P12 20200715	7-15-20	8:30	W	8	2		X									
4	WG1620 P12MS 20200715	7-15-20	8:30	W	8	2		X									
5	WG1620 P12MSD 20200715	7-15-20	8:30	W	8	2		X									
6	WG1620 FB02 20200715	7-15-20	9:30	W	8	2			X								
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign

Shipment Method: HAND DELIVERED

Required Turnaround Time: (Check Box) [X] STD 10 Wk Days [ ] 5 Wk Days [ ] 2 Wk Days [ ] 24 Hour [ ] Other ____

Results Due Date:

Relinquished by:	Date: 7-15-20	Time: 13:55	Received by: 7/15/2020 13:55
Relinquished by:	Date:	Time:	Received by (Laboratory):
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes: UPRR Houston MWPW

Cooler ID	Cooler Temp. (o/c)
43623	3.9°
45202	3.7°
44481	3.5°

+2.5°
CF 5-0.0

QC Package: (Check One Box Below)
[ ] Level II Std QC
[ ] Level III Std QC/Raw Date
[ ] Level IV SW846/CLP
[ ] Other
[X] TRRP Checklist
[ ] TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

APPENDIX D

Waste Manifest

Please print or type. Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
TXD000820266	1	888 877 7267	019318292 JJK

GENERATOR

5. Generator's Name and Mailing Address
UPRR-Wm GHD- Attn: Manifest Receiving
6520 Corporate Dr.
Indianapolis, IN 46278
Generator's Phone: 414-267-4164

Generator's Site Address (if different than mailing address)
4910 Liberty Rd
Houston, TX 77026

6. Transporter 1 Company Name: NRC GULF
U.S. EPA ID Number: FLR000012823

7. Transporter 2 Company Name: EQ Industrial Services
U.S. EPA ID Number: MIR435642747

8. Designated Facility Name and Site Address
US Ecology-
3277 County Rd 69
Robstown, TX 78380
Facility's Phone: 800-242-3209
U.S. EPA ID Number: TXD069452340

9a HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
X	1. RQ, NA3082, Hazardous waste, Liquid, n.o.s. (Creosote), 9, PGIII (F034)	3	DM	100	G	F034	D014	D018
	2.							
	3.							
	4.							

14. Special Handling Instructions and Additional Information
LOS# 090117071-0
WR# 001738
Job# 444-911-1141

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: X Tyler Parker
Signature:
Month: 05 Day: 07 Year: 20

INT'L

16. International Shipments ☐ Import to U.S ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: X Trinidad Garcia
Signature:
Month: 05 Day: 07 Year: 20

Transporter 2 Printed/Typed Name: Matt Bazett
Signature:
Month: 8 Day: 7 Year: 20

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:

18b. Alternate Facility (or Generator) U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator) Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1	2.	3	4.
H132			

20. Designated Facility Owner or Operator Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name:
Signature:
Month: 8 Day: 17 Year: 20

EPA Form 8700-22 (Rev. 12-21) Previous editions are obsolete. DESIGNATED FACILITY TO EPA's e-MANIFEST SYSTEM

APPENDIX E

POC Concentration vs. Time Graphs

Figure E-1
2-Methylnaphthalene Concentrations vs Time - A-TZ Unit
UPRR HWPW Facility - RCRA SWMU No. 1

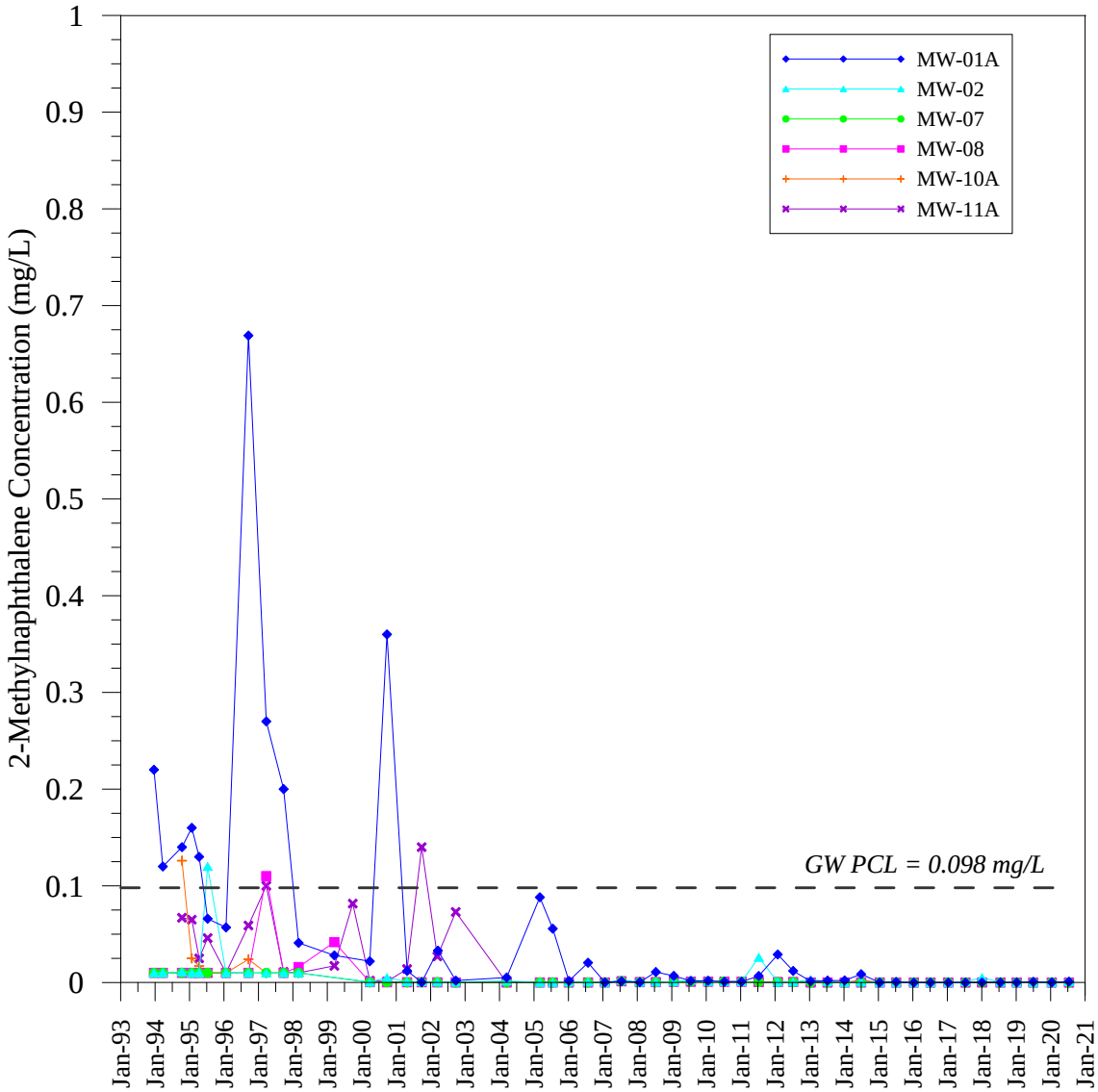


Figure E-2
Dibenzofuran Concentrations vs Time - A-TZ Unit
UPRR HWPW Facility - RCRA SWMU No. 1

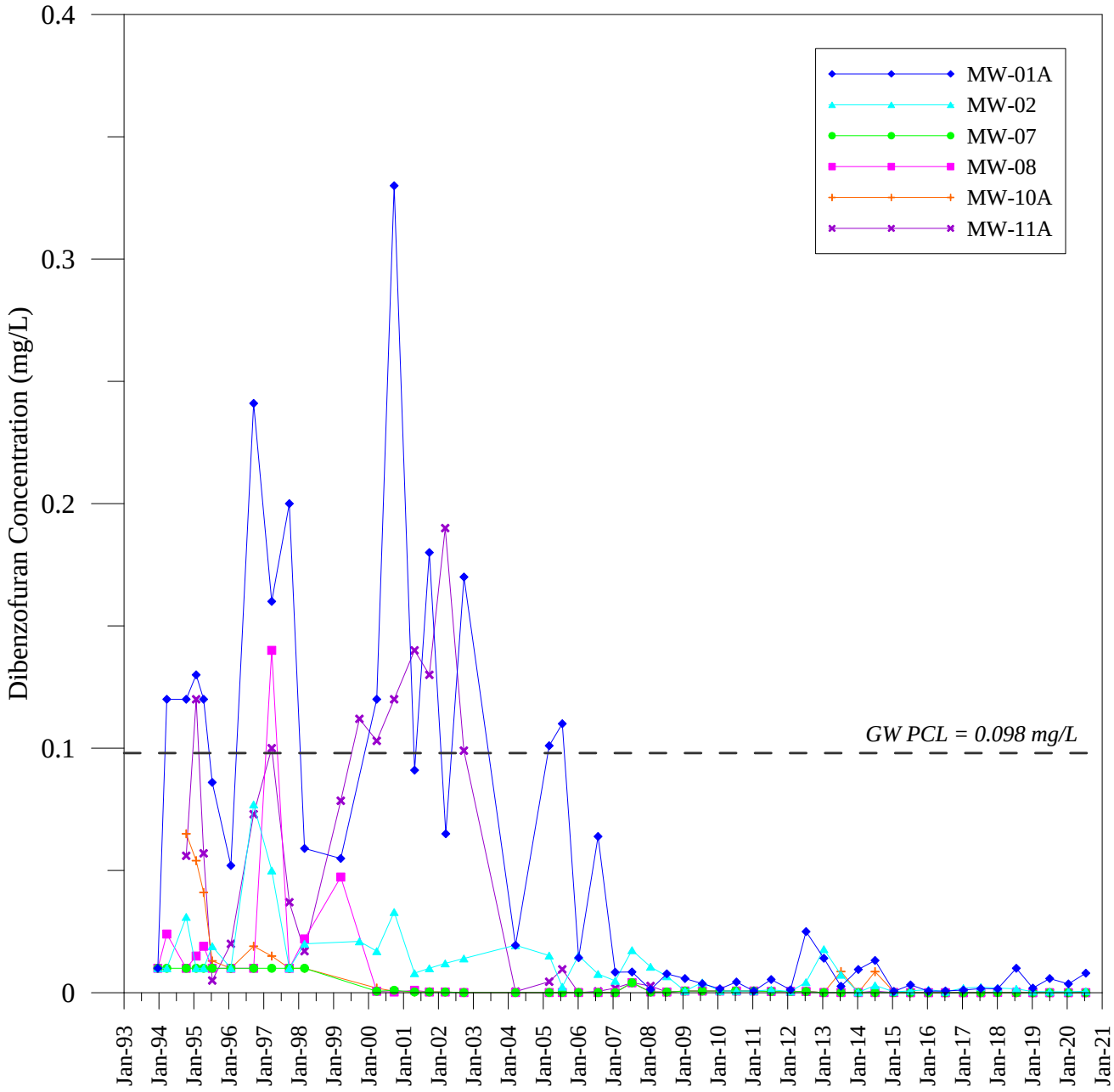


Figure E-3
Naphthalene Concentrations vs Time - A-TZ Unit
UPRR HWPW Facility - RCRA SWMU No. 1

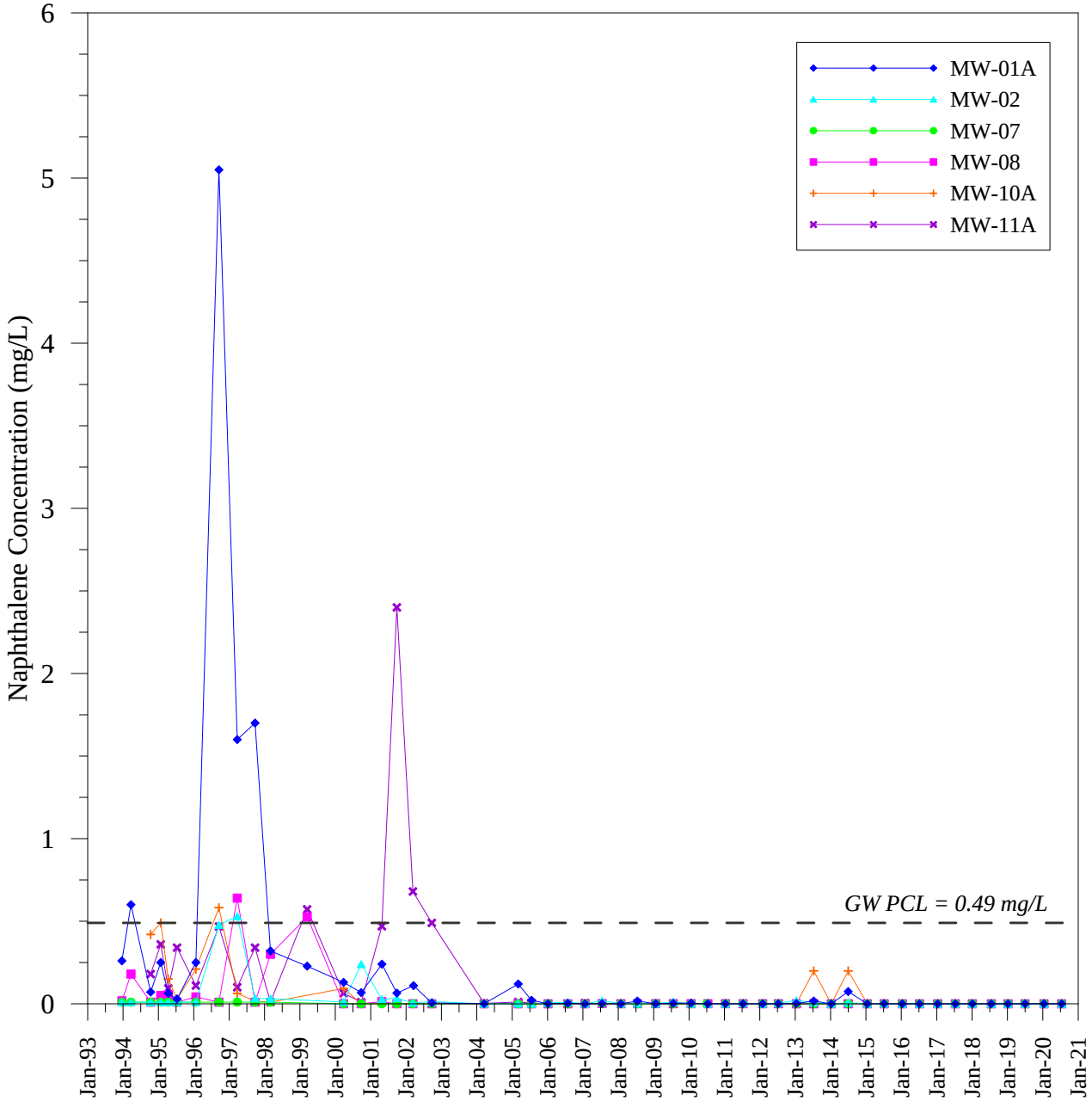
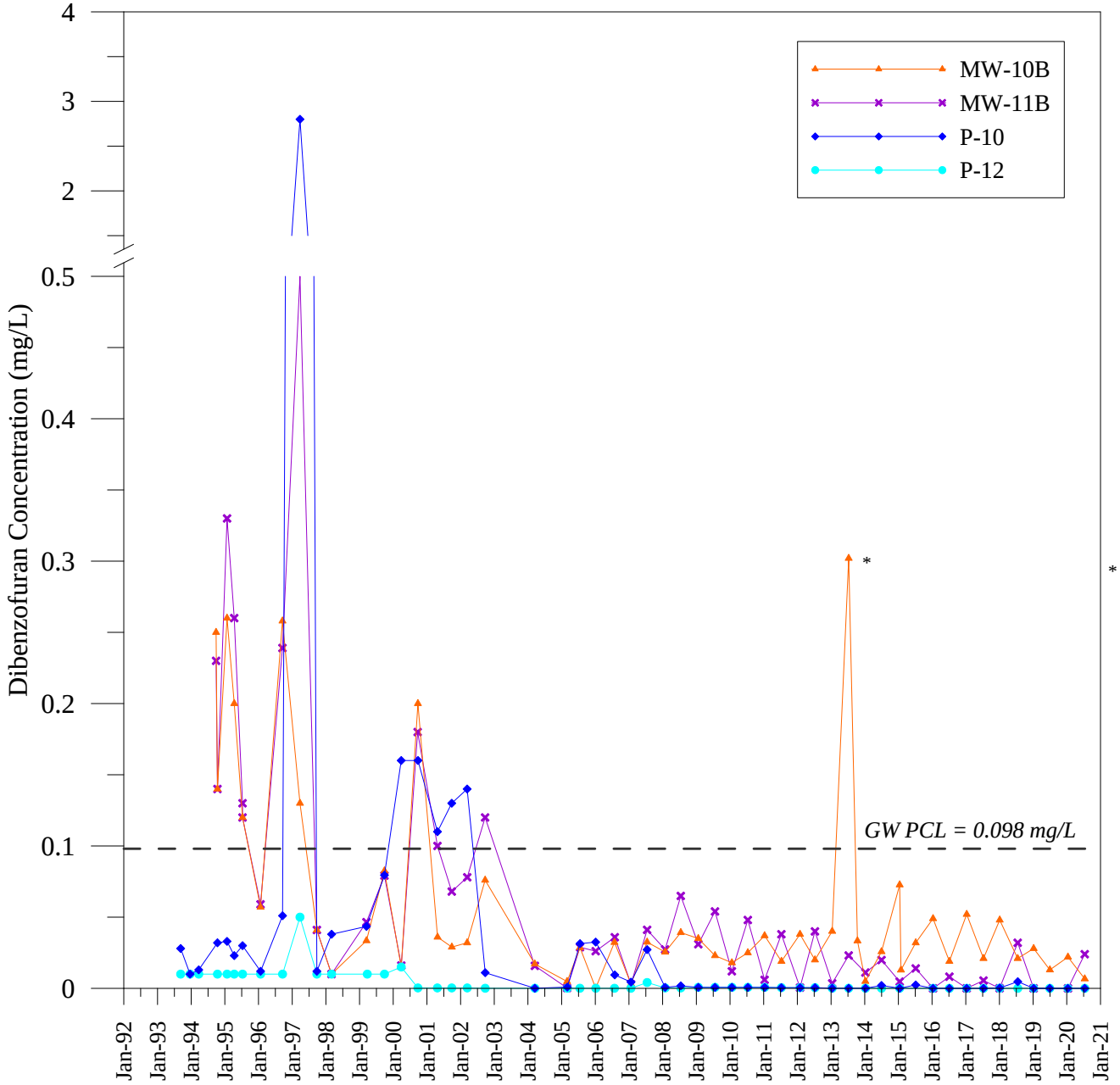
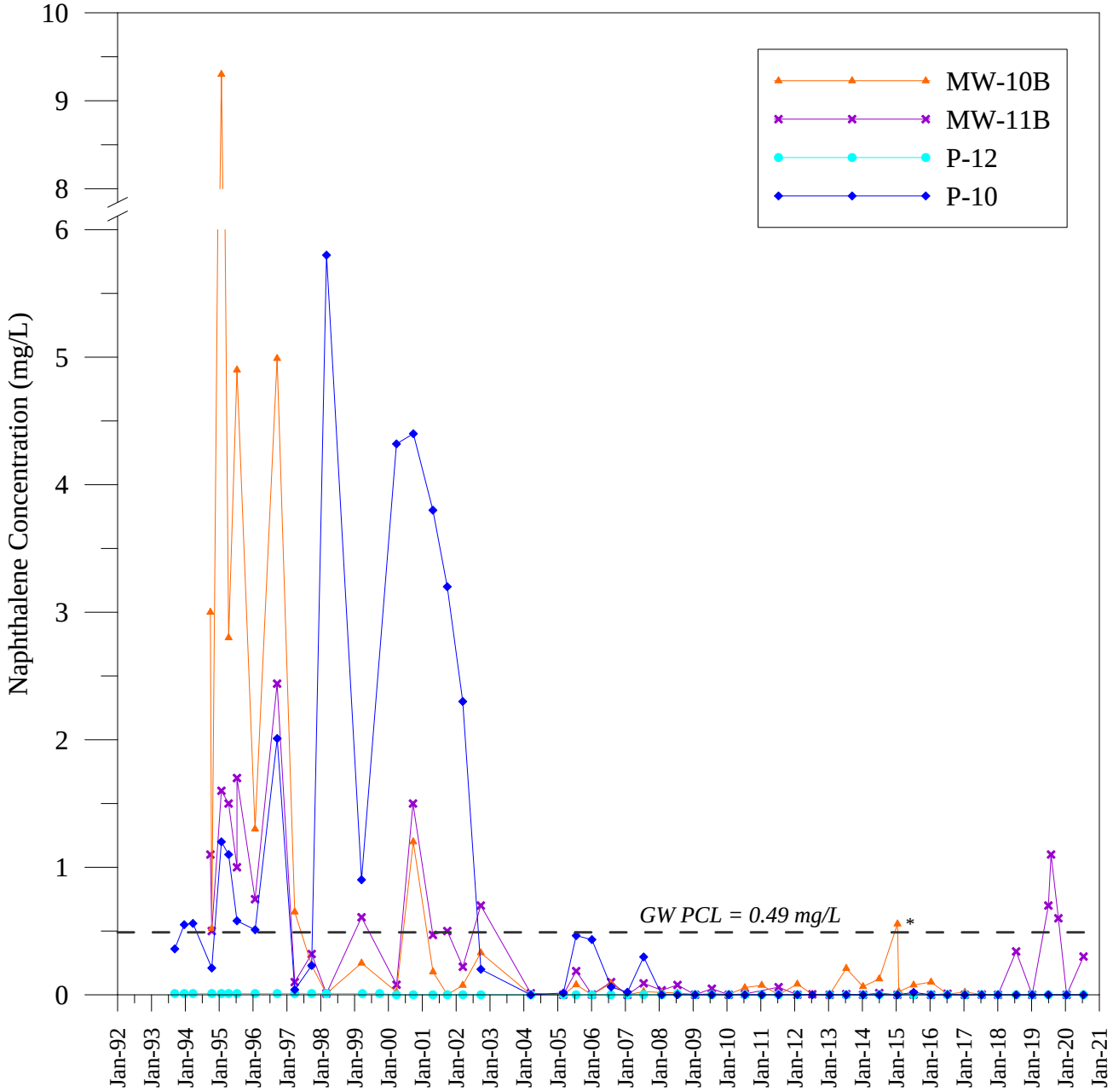


Figure E-4
Dibenzofuran Concentrations vs Time - B-TZ Unit
UPRR HWPW Facility - RCRA SWMU No. 1



* - unverified result

Figure E-5
Naphthalene Concentrations vs Time - B-TZ Unit
UPRR HWPW Facility - RCRA SWMU No. 1

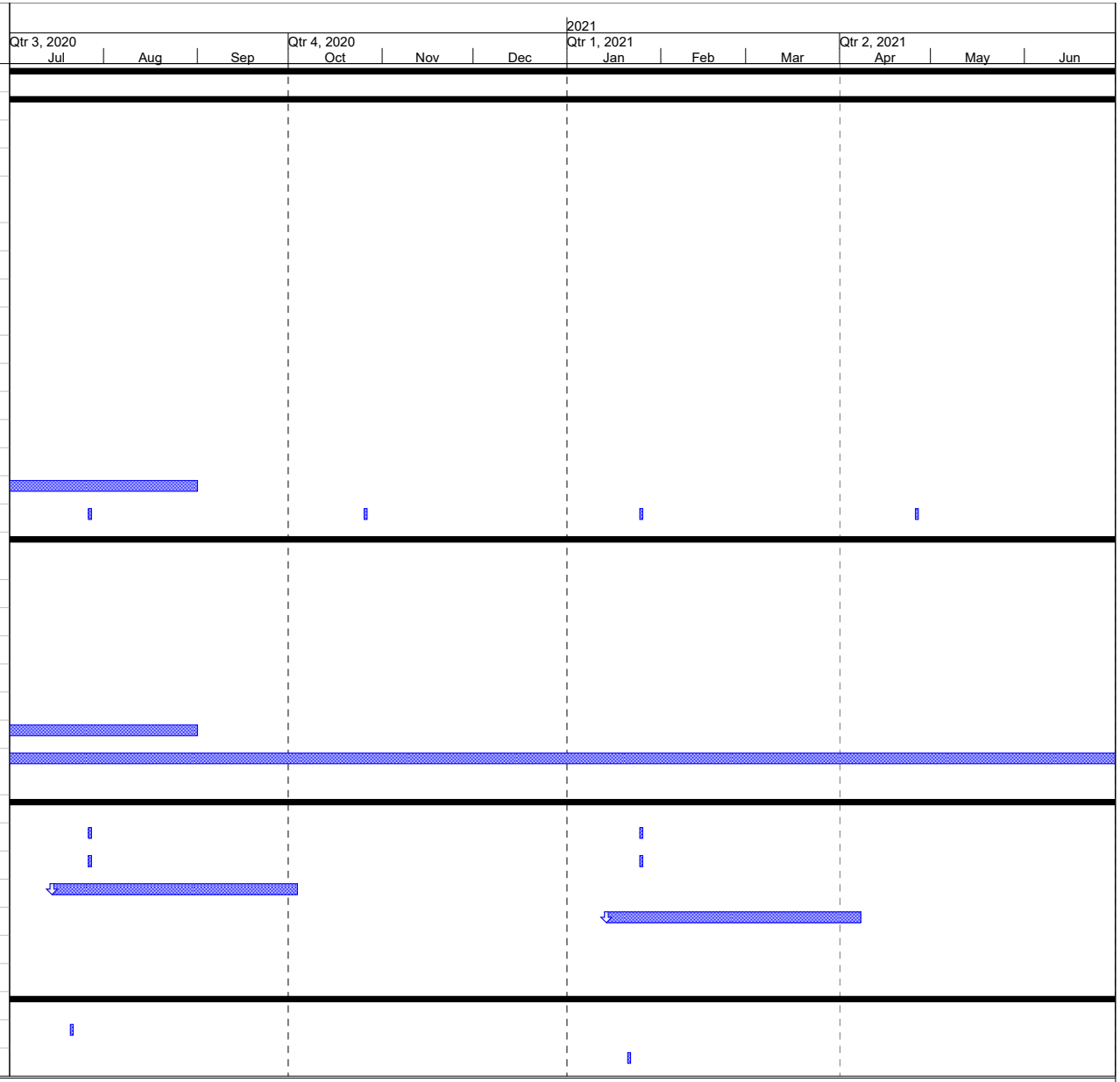


* - unverified result

APPENDIX F

Updated Compliance Schedule

ID	Task Name/Permit or CP Section No.
1	**Facility Management**
2	**RCRA Permit/Compliance Plan Renewal and Major Amendments**
3	Draft Permit Renewal/Compliance Plan and Major Amendments
4	TCEQ Review of Permit Renewal/Major Amendments
5	Prepare Response to Technical NOD and Submit Permit Renewal/Major Amendments Revision No. 2
6	TCEQ Review of Technical NOD Response, Permit Revision No. 2
7	Respond to TCEQ 2nd Technical NOD Letter, Submit Revision No. 3
8	TCEQ Review of 2nd Technical NOD Response, Permit Revision No. 3
9	Respond to TCEQ 3rd Technical NOD Letter, Submit Revision No. 4
10	TCEQ Review of 3rd Technical NOD Response, Permit Revision No. 4
11	TCEQ Review of GW Inv/POE Data for RAP
12	Respond to TCEQ 4th Technical NOD Response
13	TCEQ Review of 4th Technical NOD Response
14	Additional investigations
15	Permit Revision No. 5
16	General Inspection Requirements (quaterly) [Permit Section III.D; Table III.D]
78	**Corrective Measures Implementation (CMI)/Response Action Plan (RAP) [CP Section VIII.F]**
79	TCEQ Review of RAP (part of Compliance Plan)
80	Prepare RAP Revision No. 1 (Compliance Plan Rev2)
81	Prepare RAP Revision No. 2 (Compliance Plan Rev3)
82	TCEQ Review of RAP (part of Compliance Plan)
83	Prepare RAP Revision No. 3 (Compliance Plan Rev4)
84	Prepare RAP Revision No. 4 / Pre-Design Investigation Activities
85	Implement Corrective Action as detailed in RAP (pending approval of Permit Renewal/Compliance Plan)
86	**Ground-Water Monitoring Program [Permit Section VI.A.; CP Section VI.]**
87	Water Level Measurements (Semiannually) [CP Section VI.C.4.a]1
119	Monitoring Well Inspections (Semiannually) [CP Section VI.C.4.a]1
151	Ground Water Sampling and Data Evaluation (2nd Semiannual) [CP Setion VI.C.2]
152	Ground Water Sampling and Data Evaluation (1st Semiannual) [CP Setion VI.C.2]
153	Ground Water Sampling and Data Evaluation (2nd Semiannual) [CP Setion VI.C.2]
154	Ground Water Sampling and Data Evaluation (1st Semiannual) [CP Setion VI.C.2]
155	**Response and Reporting [Permit Section II.B.7; CP Section VII.)**
156	First Semi-Annual GW Monitoring Report - July 21 [CP Section VII.C.2]
174	Second Semi-Annual GW Monitoring Report - January 21 [CP Section VII.C.2]



Compliance Schedule
UPRR Houston Wood Preserving Works Site
Houston, Texas

Task	Split	Inactive Milestone	Start-only		
Milestone	External Tasks	Inactive Summary	Finish-only		
Summary	Project Summary	Manual Task	Progress		
Rolled Up Task	External Milestone	Duration-only	Deadline		
Rolled Up Milestone	Inactive Task	Manual Summary Rollup			
Rolled Up Progress	Inactive Task	Manual Summary			

APPENDIX G

Laboratory Data QA/QC Report Checklist

FORMER HOUSTON WOOD PRESERVING WORKS
LABORATORY DATA QA/QC REPORT CHECKLIST
ANALYTICAL REPORT HS20070658
July 24, 2020

Facility Name: Former Houston Wood Preserving Works SWMU 1	**Permit/ISW Reg No.: 50343**	**For TCEQ Use Only**
Laboratory Name: ALS Environmental	**EPA I.D. No.:**	**Project Mgr:**
Reviewer Name: Michelle Hermiston		
Date: 11/10/2020	**Date:**	

Description	Status	More in Case Narrative (Check Box)	Technically Complete
1. Were laboratory analyses performed by a laboratory accredited by TCEQ, whose accreditation included the matrix (ces), methods, and parameters associated with the data? If not was an explanation given in the Case-Narrative (e.g., laboratory exemption, accreditation for method /parameter not available from TCEQ)?	**Yes☒ No☐ NA☐**	☐	**Yes☐ No☐ NA☐**
2. Was a Case Narrative from laboratory (QC data description summary) submitted with the data set?	**Yes☒ No☐ NA☐**	☐	**Yes☐ No☐ NA☐**
3. Are the sample collection, preparation and analyses methods listed in the permit, preparation and analysis methods listed in the permit or other documents specifying criteria the ones used on the final report?	**Yes☒ No☐ NA☐**	☐	**Yes☐ No☐ NA☐**
4. Were there any modifications to the sample collection, preparation and/or analytical methodology (ies)? If so was the description included on the Case-Narrative?	**Yes☐ No☒ NA☐** **Yes☐ No☐ NA☒**	☐	**Yes☐ No☐ NA☐**
5. Were all samples prepared and analyzed within required holding times?	**Yes☒ No☐ NA☐**	☐	**Yes☐ No☐ NA☐**
6. Were samples properly preserved according to method and QAPP requirements?	**Yes☒ No☐ NA☐**	☐	**Yes☐ No☐ NA☐**

Description	Status	More in Case Narrative (Check Box)	Technically Complete
7. Have the method detection limits (MDL) and/or practical quantitation limit (PQL) been defined in the final report? Note: NELAC uses terms limit of detection (LOD) and Limit of Quantitation respectively.	Yes☒ No☐ NA☐	☐	Yes☐ No☐ NA☐
8. Do parameters listed on final report match regulatory parameters of concern (POC) specified in permit and/or Waste Analysis Plan or other required document? Note: POC may also be referred to chemicals of concern (COCs)	Yes☒ No☐ NA☐	☐	Yes☐ No☐ NA☐
9. Are the POCs included within the analytical methods target analyte list?	Yes☒ No☐ NA☐	☐	Yes☐ No☐ NA☐
10. Were the appropriate type(s) of blanks analyzed?	Yes☒ No☐ NA☐	☐	
11. Did any blank samples contain POC concentrations >5x or 10x of MDL? If so, please explain potential bias?	Yes☐ No☒ NA☐	☐	Yes☐ No☐ NA☐
12. Were method blanks taken through the entire preparation and analytical process?	Yes☒ No☐ NA☐	☐	Yes☐ No☐ NA☐
13. Did the calibration curve and continuing calibration verification meet regulatory (e.g. NELAC Standards) method specifications (No. of standards, acceptance criteria, etc.)?	Yes☒ No☐ NA☐	☐	Yes☐ No☐ NA☐
14. Do the initial calibration standards include a concentration below the regulatory limit/decision level? If not please explain? If an MDL and PQL are each used on a report then the relationship between the two must be defined for each method.	Yes☐ No☒ NA☐ Yes☐ No☐ NA☒	☐	Yes☐ No☐ NA☐
15. Were manual peak integrations performed? If so pre and post chromatograms and method change histories may be requested?	Yes☐ No☒ NA☐ Yes☐ No☐ NA☒	☐	Yes☐ No☐ NA☐
16. Were all results bracketed by a lower and upper range calibration standard?	Yes☒ No☐ NA☐	☐	Yes☐ No☐ NA☐
17. Was any result reported outside of the range of the calibration standards?	Yes☐ No☒ NA☐	☐	Yes☐ No☐ NA☐
18. Were all matrix spike (MS) and MS duplicate (MSD) recoveries within the data decision making goals of QC data in the RCRA/UIC QAPP and/or within the laboratories control charts? If not were data flagged with explanation in case narrative?	Yes☒ No☐ NA☐ Yes☐ No☐ NA☒	☐	Yes☐ No☐ NA☐
19. Were all of the MS and MSD relative percent differences (RPDs) within the data decision making goals of QC data in the RCRA/UIC QAPP? If not were data flagged with explanation in case narrative?	Yes☒ No☐ NA☐ Yes☐ No☐ NA☒	☐	Yes☐ No☐ NA☐
20. Were all laboratory control sample (LCS) recoveries at least within the MS and MSD ranges of recoveries and within laboratories control charts? If not were data flagged with explanation in Case Narrative?	Yes☒ No☐ NA☐ Yes☐ No☐ NA☒	☐	Yes☐ No☐ NA☐

Description	Status	More in Case Narrative (Check Box)	Technically Complete
21. Were all POCs (COCs) in the LCS?	**Yes☒ No☐ NA☐**	☐	**Yes☐ No☐ NA☐**
22. Were the MS and MSD from samples collected for this work order or other samples in the analytical batch as defined by the NELAC Standards? *This information is used to identify factors contributing to matrix interferences. It should not be assumed, unless it is understood by the laboratory, that samples relating to this report were the ones selected to be fortified with the POCs*.	**Yes☒ No☐ NA☐**	☐	**Yes☐ No☐ NA☐**
23. Were any of the samples diluted? If so were appropriate calculations made to the MDL and/or PQL of the final report?	**Yes☒ No☐ NA☐**	☐	**Yes☐ No☐ NA☐**

LABORATORY DATA REPORT QA/QC CHECKLIST
LABORATORY CASE-NARRATIVE
(To accompany laboratory checklist)

	Facility Name: Former Houston Wood Preserving Works SWMU 1	**Permit/ISW Reg No.: 50343**
	Laboratory Name: ALS Environmental	**EPA I.D. No.:**

Method No.	Non-conformance Description	Method Modification Description
SW8270	Sample WG-1620-MW11B-20200714: surrogate recoveries could not be determined due to dilution below the calibration range.	NA
SW8270	Naphthalene was detected in WG-1620-FB01-20200714; associated samples were qualified.	NA
SW8270	The relative percent difference (RPD) of naphthalene and 2-methylnaphthalene concentrations in samples WG-1620-MW01A-20200714 and WG-1620-DUP01-20200714 were greater than thirty percent; samples were qualified.	NA