Texas Commission on Environmental Quality

Remediation Division Correspondence Identification Form

SITE & PROGRAM AREA IDENTIFICATION

SITE LOCATION

Site Name: Union Pacific Railroad Houston Wood Preserving Works

Address 1: 4910 Liberty Road

Address 2:

Houston State: **Texas**

Zip Code: 77026 County: Harris

TCEQ Region: Houston - 12

REMEDIATION DIVISION PROGRAM AND FACILITY IDENTIFICATION

Is This Site Being Managed Under A State Lead Contract? ☐ Yes ☑ No

Program Area: IHW Corrective Action

Mail Code: MC-127 (IHW)

Is This A New Site To This Program Area? ☐ Yes ☑ No

Additional Information: SWR No. 31547

Additional Information: Permit/ Compliance Plan No. 50343

DOCUMENT(S) IDENTIFICATION

	PHASE OF REMEDIATION	DOCUMENT NAME
1.	Miscellanous	UPDATED VAPOR INTRUSION ASSESSMENT INTERIM REPORT
2.	Please select a phase of remediatic	
3.	Please select a phase of remediatic	
4.	Please select a phase of remediatic	
5.	Please select a phase of remediatic	

CONTACT INFORMATION

☑ I attest that all work has been done in accordance with TCEQ rules ☑ I certify that I am aware misrepresentation of any claim is a violation.

RESPONSIBLE PARTY/APPLICANT/CUSTOMER INFORMATION (IF APPLICABLE)

Union Pacific Railroad

ENVIRONMENTAL CONSULTANT/REPORT PREPARER/AGENT

Golder Associates Inc.

SIGNATURES

DATABASE CODES

Document No.	TCEQ Database Term	Document No.	TCEQ Database Term
1.		4.	
2.		5.	
3.			

August 4, 2020 Project No. 19119232

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

UPDATED SOIL VAPOR INTRUSION ASSESSMENT INTERIM REPORT
UNION PACIFIC RAILROAD HOUSTON WOOD PRESERVING WORKS FACILITY
4910 LIBERTY ROAD, HOUSTON, TEXAS
POST-CLOSURE CARE PERMIT NO. HW-50343; INDUSTRIAL SWR NO. 31547

Dear Ms. Hatfield,

Golder Associates Inc (Golder) is pleased to provide, on behalf of Union Pacific Railroad (UPRR), this updated Soil Vapor Intrusion Assessment Interim Report summarizing the vapor intrusion (VI) evaluation conducted at the UPRR Houston Wood Preserving Works (HWPW) site (the Site). This letter details the VI evaluation background, overview of potential vapor migration processes, field procedures, soil and soil gas sample collection, quality control/quality assurance, and data evaluation, as discussed below. This letter report serves as an update to the Soil Vapor Intrusion Assessment Interim Report dated March 31, 2020. The information that was provided in the March 31, 2020 report is also provided in this letter report to aid in the review of the overall VI assessment.

Background

The Texas Commission on Environmental Quality (TCEQ) issued the 4th Technical Notice of Deficiency (TNOD) dated April 11, 2019 requesting UPRR conduct a supplemental groundwater evaluation for potential VI from the A-Transmissive Zone (A-TZ) in the residential area north of the Site near monitoring well MW-68B (detailed in TCEQ Deficiency ID T59). UPRR completed the agreed upon groundwater evaluation in May 2019 and submitted the results of the evaluation in a letter dated July 3, 2019 that was included in Appendix 3 of the Conceptual Response Action Plan – Revision No. 4 dated July 9, 2019. The results of the groundwater evaluation documented that concentrations of chemicals of concern (COC) in the groundwater sample from the May 2019 sampling event at A-TZ monitoring well MW-68A (installed next to MW-68B) were below the conservative screening values estimated by U.S. Environmental Protection Agency's (EPA's) VI Screening Level (VISL) calculator (EPA, 2019) and indicated the VI pathway was incomplete.

The TCEQ acknowledged the July 3, 2019 letter and requested further evaluation of the VI pathway in a letter dated September 6, 2019. UPRR, Golder and TCEQ met on September 23, 2019 at the TCEQ Austin Office to discuss options to further evaluate the VI pathway. Based on those discussions, Golder, on behalf of UPRR, submitted a response letter dated October 23, 2019 to the TCEQ comment letter dated September 6, 2019

detailing the proposed VI assessment through a soil gas evaluation north of the Site. The TCEQ issued a letter dated December 13, 2019 requesting a meeting to discuss the proposed VI field activities. The proposed VI assessment field activities were discussed during the meeting on December 19, 2019 between UPRR, Golder, and TCEQ. Based on that meeting, Golder, on behalf of UPRR, submitted the Proposed Vapor Intrusion Assessment Work Plan (Work Plan) dated December 20, 2019 to the TCEQ for review. The TCEQ issued a comment letter on the Work Plan dated December 23, 2019. A revised Work Plan was submitted to the TCEQ on January 2, 2020 and was approved by the TCEQ in a letter dated January 3, 2020 and field activities were initiated on January 29, 2020. A change in soil gas probe installation procedures was needed due to field conditions, and an updated Work Plan dated January 31, 2020 was submitted following a conference call with the TCEQ on January 30, 2020 to document the modified installation procedures. The updated plan was approved via e-mail from the TCEQ on January 31, 2020 with the request that soil gas probes be allowed to equilibrate for 10 days after installation prior to soil gas sample collection.

In January and February 2020, 22 shallow, single-depth soil gas probes were installed off-site in the City of Houston Right-of-Way (ROW). Nine of the 22 locations were not sampled for soil gas due to the presence of water in the probes. Golder submitted to the TCEQ the Soil Vapor Intrusion Assessment Interim Report dated March 31, 2020 summarizing the preliminary assessment. The TCEQ issued an Approval with Comments letter dated April 23, 2020, requesting installation of alternate soil gas probe sampling locations in the general vicinity of the existing probes that contained water. Golder, on behalf of UPRR, proposed alternate soil gas probe locations in the City of Houston ROW and on private property in a response letter dated May 1, 2020. The TCEQ issued an Approval with Comments letter dated May 19, 2020. UPRR obtained an access agreement with the private property owner and six additional soil gas probes were installed and soil gas sample collection was attempted in June 2020. The following discussion includes the January-February 2020 soil gas sampling results supplemented with the June 2020 alternate soil gas probe sampling results.

Overview of Potential Vapor Migration Processes

Vapor intrusion describes the migration of volatile organic vapors from a subsurface source, such as impacted soil or groundwater, into an overlying building. This migration may occur through subsurface soils and then through foundations and basements, or through preferential pathways such as utility conduits or other openings in the buildings. As outlined in the EPA's guidance document, *OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air*, VI is considered a potential human exposure pathway, with the pathway only considered complete when all of the following conditions are met (EPA, 2015a):

- A source of vapors is present underneath or near the buildings;
- Vapor migration from the source to the building (receptor) can occur;
- The vapors can enter the building;
- Chemicals associated with the vapor source are found in the building; and
- The buildings are occupied when the chemicals associated with the vapor source are present.

If all of these conditions are met, then the VI pathway may be complete and there may be an opportunity for human exposure, which indicates additional analysis may be required to determine if an exposure condition exists. If one or more of these conditions are not present and are not reasonably expected to be present in the

future, the VI pathway is considered “incomplete”. An example of a condition that would render the pathway incomplete is if vapor migration is impeded by the geology, hydrogeology, or biochemical (biodegradation) conditions present at a site. A determination that the VI pathway is incomplete should be supported by site-specific information that shows the nature and extent of the vapor source in the subsurface is well understood, and that the vapor sources, vadose zone conditions, and surrounding infrastructure would not allow for the unattenuated or enhanced migration of vapors. If the VI pathway is shown to be incomplete, additional VI investigation and mitigation is typically not necessary (EPA, 2015b).

In addition to the general guidance for addressing vapor intrusion, EPA has developed a companion guide to address VI specifically associated with petroleum hydrocarbons (*Technical Guide for Addressing Petroleum Vapor Intrusion at Leaking Underground Storage Tank Sites*). This guidance recognizes the difference between petroleum hydrocarbon vapor intrusion (PVI) and VI associated with other volatile chemicals. While the PVI guidance is primarily intended to address releases associated with underground storage tank (UST) releases, the guidance is also appropriate for evaluating non-UST sites that may have similar characteristics (i.e., size, chemicals of concern) (EPA, 2015a). PVI is a sub-category of VI that occurs when volatile petroleum hydrocarbons released as vapors from various subsurface sources (free product, soil, groundwater) migrate into buildings through the vadose zone. The migration of petroleum hydrocarbon vapors can be highly limited by biodegradation occurring in the vadose zone. The amount of biodegradation is dependent on the strength of the vapor source, the distance the vapors travel through the soil of the vadose zone, and availability of oxygen (O_2) in the vadose zone (ITRC, 2014).

Field Procedures

Golder installed 22 shallow, single-depth soil gas probes off-site within the City of Houston ROW in January and February 2020 and 6 additional probes on private property and in the City of Houston ROW in June 2020 to evaluate the VI pathway at the Site (Figure 1). Prior to the start of activities, Golder obtained required permits from the City of Houston, conducted the necessary utility notifications (i.e. 811 One Call and reviewed City of Houston utility maps), and used a private utility locator using ground penetrating radar (GPR) to scan each proposed location. UPRR obtained an access agreement with a private landowner (Greater Mount Nebo Baptist Church) to install 5 soil gas probes on the private property located at 5005 Liberty Road in June 2020. Boreholes and soil gas point installation were completed by Cascade Environmental, a Texas-licensed drilling firm subcontracted by Golder.

On January 29, 2020, soil gas points were advanced using a hand-auger. During installation of the second soil gas probe, the field crew encountered material at a depth of around 5.5 feet below ground surface that was suspected to potentially be a buried utility pipe. Upon further investigation, the material encountered was identified as buried brick and concrete debris within general fill material and not associated with an underground utility. The depth of the debris (approximately 3 to 4 feet bgs) and other environmental variables, such as soil moisture, prevented GPR from locating anomalies deeper than 2 feet with confidence. Therefore, in consideration of this encounter and given the high potential for the presence of underground utilities in the area that could not be located using GPR or identified on city utility maps (i.e., private sanitary sewer service lines), Golder proposed modifying the soil gas probe installation procedures to use hydrovac excavation methods (i.e., excavation using a high-pressure water probe and vacuum) to advance the remaining boreholes. This modification to the Work Plan was approved by the TCEQ via e-mail on January 31, 2020. The remaining 21 soil gas probes were installed in February 2020 and six additional soil gas probes were installed in June 2020 in

accordance with the methods outlined in the modified approved Work Plan (using hydrovac excavation) with the following exception: three soil gas probes (SG-25, SG-26, and SG-27) located on private property were advanced using a hand-auger due to the low potential for underground utilities in the area.

The general lithology of the borings consisted of brown sandy clay from the surface to a depth of approximately 4 feet below ground surface (bgs) with a light grey clay with sand present from approximately 4 to 6 feet bgs. Except at locations SG-21 through SG-27, historical debris such as brick, concrete, and glass were found in the boreholes at a depth interval from approximately 2 to 3.5 feet bgs.

Soil gas points were constructed in accordance with EPA guidance and the approved Work Plan procedures (Figure 2). First, the boreholes for the soil gas points were backfilled from the bottom of the hole (6 feet bgs) to 5.5 feet bgs with a filter pack of industrial silica sand. Next, a 6-inch long by 0.5-inch in diameter soil vapor implant, composed of a stainless-steel mesh screen with a 0.15 mm pore size, was connected to ¼-inch outer diameter Teflon tubing with a Swagelok compression fitting and placed into the borehole. Filter pack material was backfilled around the soil vapor implant to a depth of 5 feet bgs. The borehole was then backfilled with bentonite by hydrating bentonite granules from 5 feet bgs to 1 feet bgs. The upper foot of the borehole was sealed with cement and the tubing housed in a 5-inch diameter flush-mount vault centered in a concrete pad (SG-06, SG-14, SG-20, SG-21, SG-22, SG-25, SG-26, and SG-27) or concrete/asphalt road/sidewalk. The sample tubing extending from the sample point was sealed and coiled inside the vault.

The approximate location of each soil gas point was surveyed in the field using a Trimble handheld GPS unit.

Soil Sample Collection

During the installation of the soil gas points, advancement of the borings was halted to collect an undisturbed soil sample from the 0.5 to 1 feet interval and the 5.5 to 6 feet interval at each location according to Method 5035A. The undisturbed soil sample was collected using a 1-inch diameter soil probe with a 12-inch long plastic liner within the collection chamber. The samples were field screened with a MiniRAE Photoionization Detector (PID) for the presence of VOCs. Prior to sampling, the PID was calibrated using 100 parts per million by volume (ppmV) isobutylene standard. The soil probe was decontaminated after each sample collection and a new plastic sleeve replaced the used one.

Soil samples were placed in laboratory-supplied containers, stored on ice in an insulated cooler, and delivered to ALS Environmental in Houston, Texas for analysis of benzene, ethylbenzene, and xylenes by EPA Method 8260 and naphthalene by EPA Method 8270. A completed chain-of-custody accompanied the samples through receipt at the analytical laboratory. Copies of the laboratory reports and data usability summaries for the soil sample data prepared pursuant to Texas Risk Reduction Program (TRRP)-13 Guidance are included in Attachment 1. A summary of the soil analytical results and PID readings is provided in Table 1.

Soil Gas Sample Collection

Soil gas samples were collected a minimum of 10 days after the installation of the sample points using the procedures described in the approved Work Plan. A leak check was performed at each sample point using helium gas as a tracer. The leak check was conducted by introducing helium gas into a shroud over the sample point and measuring the concentration of helium in the shroud, around 20% to 50% during this check, and then measuring the concentration of helium in vapor from the sampling point. An MGD-2002 helium detector was used to measure the initial tracer gas concentration in the shroud and in the soil gas point. Helium was not

detected in any of the soil gas points during the leak check, indicating that the sample points were adequately sealed from ambient air.

Prior to sample collection, each sample point was purged of approximately 90 milliliters (ml) of air. Soil gas samples were collected using laboratory certified-clean 1-L summa canisters. The vacuum on each canister was verified prior to sample collection and the sample train was checked for leaks using a shut-in/vacuum test prior to sampling. The canister was connected to a sampling train consisting of a “T” fitting and two valves. A shut-in/vacuum test was performed on the sampling train to check for leaks. To collect the sample, the sample tubing was connected to the sampling train with compression fittings, which were then connected to the summa canister. The sample was collected by opening the valve on the summa canister and monitoring the vacuum as the sample was collected. Samples were collected at a flow rate of 200 ml/minute using flow controllers set and provided by the laboratory. Based on the vacuum readings observed during sample collection, the sample collection rate was consistent with a flow rate of 200 ml/minute. To collect the duplicate sample, a “T” fitting was added to the sample train and the parent and duplicate sample collected concurrently.

Soil gas sample collection began on February 19, 2020 at the locations installed in January-February 2020. During this sampling event, it was observed that water had infiltrated sample points SG-03, SG-09, and SG-13. Another sampling event was scheduled for February 27, 2020 to meet the minimum 10 days after installation requirement for the remaining locations that were installed in mid-February 2020. On February 25, 2020, the remaining soil gas sample points were checked for water by connecting a peristaltic pump to the installation tubing. If water was discovered, the soil gas points were purged until dry. Water had infiltrated 9 of the 22 soil gas points (SG-01 through SG-07, SG-09, and SG-13) and they were purged dry, except for SG-03. Water recharged in SG-03 at a rate equal to the pump rate. On February 27, 2020, Golder representatives were on-site to collect the remaining soil gas samples with oversight from TCEQ representatives. Water had re-infiltrated the soil gas points (SG-01 through SG-07, SG-09, and SG-13) that had been purged dry two days prior and were not able to be sampled. A review of various state and federal guidance documents did not reveal any corrective measures to be implemented when soil gas points become saturated with water. However, per the analytical laboratory, a vapor sample would be compromised if water were to enter the summa canister during sampling, and the water would likely cause damage to the summa canister. Based on discussions with TCEQ staff, the TCEQ agreed that these water saturated soil gas probes would not be sampled.

Another sampling event was conducted on June 30, 2020 to collect soil gas samples from the six additional soil gas probe locations that were installed on June 18 and 19, 2020. Water had infiltrated four of the six soil gas points, including three of the five installed on the Greater Mount Nebo Baptist Church Property (SG-23, SG-24, and SG-26) and the replacement location for SG-13 (SG-13R). Soil gas samples were collected at SG-25 and SG-27 in June 2020. The initial soil gas points that were saturated with water in February 2020 were checked, and those points continued to be saturated with water. Even though three of the five additional soil gas probes installed on the Greater Mount Nebo Baptist Church property had water in them, soil gas samples were collected from three locations (SG-08 (in February), SG-25, and SG-27) on the property between Lavender Street and Clementine Street.

Following collection, soil gas samples were shipped to Pace Analytical in Minneapolis, Minnesota for analysis of benzene, ethylbenzene, naphthalene, and xylenes by EPA Method TO-15. A completed chain-of-custody accompanied the samples through receipt at the analytical laboratory. Copies of the laboratory reports and data

usability summaries for the soil gas sample data prepared pursuant to TRRP-13 Guidance are included in Attachment 2. A summary of the soil gas analytical results is provided in Table 2.

Quality Assurance/Quality Control

Sampling activities were conducted in accordance with general industry standard practices and as specified in the approved Work Plan. Samples were handled under appropriate chain-of-custody documentation. To confirm the accuracy and reproducibility of the laboratory analytical results, the analytical laboratory implements a program that includes laboratory replicate samples, method blanks and control standards. The laboratory QA/QC data generated during the sample analysis are included in the laboratory analytical report provided to Golder (provided as Attachments 1 (soil samples) and 2 (soil gas samples) to this letter report). Field QA/QC protocols included field duplicate samples and ambient air control samples AA-1 (2/19/2020), AA-2 (2/27/2020), and AA-3 (6/30/20) that were collected during sampling events to assess background conditions. The ambient air control samples were collected within the vicinity of the soil gas points in 6-liter summa canisters with a 200 ml/minute flow regulator. A sample of the helium used for the leak test procedure, HE-1, was also collected by providing a constant flow of helium gas to the summa canister inlet. Duplicate soil gas samples were collected during each soil gas sampling event following the procedures outlined above. Analytical results of the control samples are summarized in Table 2.

The analytical data were validated pursuant to TRRP-13 Guidance. Data usability summaries are included in Attachments 1 and 2.

Data Evaluation

Pursuant to TRRP procedures, analytical data for the soil samples collected from each soil gas boring were compared to the lesser value between the TRRP Residential (30 acre) $^{Tot}Soil_{Comb}$ Protective Concentration Level (PCL) and the $^{GW}Soil_{Ing}$ PCL for surface soils, which is the Residential Assessment Level (RAL). Benzene, ethylbenzene, xylene, and naphthalene concentrations in the soil samples collected during the soil gas probe installation were generally not detected and in all cases were below applicable RALs (Table 1). These data support a conclusion that the vertical separation distance consisting of clean soil between potential receptors at the ground surface, and the potential source of contamination (groundwater), is greater than 6 feet (the base depth of the deeper soil samples collected for this evaluation).

Consistent with the approved Work Plan, soil gas analytical results were compared to the target soil gas assessment levels which are calculated by dividing the TRRP Residential Risk-Based Exposure Limits (RBELs) for inhalation ($^{Air}RBEL_{Inh}$) by an attenuation factor of 0.03 (US EPA, 2015b) for soil gas. The inhalation RBELs apply to sites under TRRP and are considered protective concentrations for a COC in air at the point of exposure (POE) for human inhalation. The RBEL is adjusted using the specified attenuation factor to account for the following: (1) the soil gas sample does not represent an indoor air concentration (i.e. in a POE sample) and (2) that COC attenuation through multiple processes (e.g., dispersion, biodegradation, etc.) is anticipated if vapors were to migrate from the vadose zone to an indoor air receptor. As shown in Table 2, benzene, ethylbenzene, naphthalene, and xylene concentrations in all of the soil gas samples were orders of magnitude less than their respective target soil gas assessment levels.

Other Lines of Evidence

As discussed in the Background section of this letter report, the analytical results of the A-TZ groundwater from MW-68A were below the conservative screening values estimated by EPA's VISL calculator (EPA, 2019) and indicated the VI pathway was incomplete. To further evaluate the groundwater as a potential source for the VI pathway, the A-TZ groundwater analytical data from the July 2019 and January-March 2020 sampling events from the off-site monitoring wells presented in the Interim Groundwater Monitoring Report (2019-2020) dated April 30, 2020 were compared to VISL calculator values (EPA, 2015, EPA, 2019). The VISL calculator (EPA, 2019) provides a screening level based on several basic inputs, including a residential or commercial exposure scenario, target hazard quotient, target carcinogenic risk, and groundwater temperature. For this evaluation, the selected inputs were residential scenario, hazard quotient of 0.1, carcinogenic risk of 10^{-5} (consistent with the TRRP criteria), and groundwater temperature of 25°C. A summary of the VISL values relative to the maximum detected COC concentrations from the two recent sampling events are provided in the following table.

COC	VISL Screening Level for Elimination from Further Consideration (mg/L)*	Maximum Detected COC Concentrations in Off-Site A-TZ Wells July 2019 & January-March 2020 Samples (mg/L)
Benzene	0.014	0.00036J (MW-26A-July 2019)
Chlorobenzene	0.041	<0.0003
Ethylbenzene	0.035	<0.0003
Methylene Chloride	0.471	<0.001
Toluene	1.92	<0.0002
Xylenes	0.0385	<0.0003
Benzo(a)anthracene	0.344	0.00012 (MW-25A-Jan 2020)
Naphthalene	0.0174	0.0026 (MW-27A – July 2019)
Nitrobenzene	0.715	<0.000025

* - VISL calculator values (EPA, 2015, EPA, 2019).

Groundwater COC concentrations from the July 2019 and January-March 2020 off-site A-TZ wells were below the conservative EPA VISL-calculated screening levels by orders of magnitude, providing an additional line of evidence that the VI pathway from the shallow groundwater is incomplete (Golder, 2020).

Conclusion

Based on the vertical separation distance, groundwater COC concentrations in the off-site A-TZ wells, lateral distribution of the soil gas sample locations, and benzene, ethylbenzene, xylenes, and naphthalene concentrations in soil gas samples collected for this evaluation, the lines of evidence support that the vapor intrusion pathway off-site is incomplete.

However, UPRR will submit a follow-up letter to the TCEQ with proposed steps forward to confirm that the vapor intrusion pathway is incomplete as requested during a conference call between TCEQ, UPRR, and Golder on July 30, 2020.

If you have any questions or comments, please feel free to give Mr. Kevin Peterburs of UPRR (414-267-4164) or us a call.

Sincerely,

Golder Associates Inc.

Tim Nickels
Senior Consultant

Eric Matzner, P.G.
Principal Hydrogeologist

CC: TCEQ Region 12, Houston Texas

Attachments: Table 1 – Summary of Soil Analytical Results
Table 2 – Summary of Soil Gas Analytical Results
Figure 1 – Soil Gas & Surface Soil Sampling Locations
Figure 2 – Soil Gas Probe Construction Diagram
Attachment 1 – Soil Samples – Data Usability Summary and Laboratory Analytical Reports
Attachment 2 – Soil Gas Samples – Data Usability Summary and Laboratory Analytical Reports

References

United States Environmental Protection Agency (EPA), 2015a. *Technical Guide for Addressing Petroleum Vapor Intrusion at Leaking Underground Storage Tank Sites* (EPA 510-R-15-001), June.

EPA, 2015b. *OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air* (OSWER Publication 9200.2-154), June.

EPA, 2019. Vapor Intrusion Screening Level (VISL) calculator, https://www.epa.gov/vaporintrusion/vapor-intrusion-screening-level-calculator. Accessed April 2019.

Golder Associates Inc (Golder), 2020, *Interim Groundwater Monitoring Report (2019-2020),* Union Pacific Railroad Houston Wood Preserving Works Facility, Houston, Texas, Dated April 30.

Interstate Technology & Regulatory Council (ITRC), 2014. *Petroleum Vapor Intrusion: Fundamentals of Screening, Investigation, and Management*.

TABLES

Table 1

Summary of Soil Analytical Results
UPRR Houston Wood Preserving Works

Sample Location	Sample Depth (ft BGS)	Field PID	Sample Date	Benzene	Ethylbenzene	Xylenes	Naphthalene
TRRP Tier 1 Residential Assessment Level (mg/kg)				*0.013*	*3.8*	*61*	*16*
SG-01	0.5-1	0	2/11/2020	<0.00059	<0.00082	<0.0012	<0.00070
SG-01	5.5-6	0	2/11/2020	<0.00082	<0.0011	<0.0016	<0.00073
SG-02	0.5-1	0	2/10/2020	<0.00053	<0.00075	<0.0011	**0.0024 J**
SG-02	5.5-6	0	2/10/2020	<0.00037	<0.00051	<0.00073	<0.00079
SG-03	0.5-1	0.3	2/5/2020	<0.00037	<0.00052	**0.0066**	**0.0018 J**
SG-03	5.5-6	0.1	2/5/2020	<0.00071	<0.0010	<0.0014	**0.0017 J**
SG-04	0.5-1	0	2/10/2020	<0.00044	<0.00061	<0.00087	<0.00071
SG-04	5.5-6	0.1	2/10/2020	<0.00068	<0.00096	<0.0014	<0.00072
SG-05	0.5-1	0.5	2/10/2020	<0.00037	<0.00051	<0.00073	**0.0049**
SG-05	5.5-6	0	2/10/2020	<0.00078	<0.0011	<0.0016	<0.00074
SG-06	0.5-1	0.1	2/17/2020	<0.00065	<0.00091	<0.0013	<0.0067
SG-06	5.5-6	0	2/17/2020	<0.00042	<0.00059	<0.00084	<0.00071
SG-07	0.5-1	0	2/17/2020	<0.00058	<0.00082	<0.0012	**0.0071 J**
SG-07	5.5-6	0	2/17/2020	<0.00036	<0.00050	<0.00072	<0.00072
SG-08	0.5-1	0.8	2/7/2020	<0.00062	<0.00087	<0.0012	**0.0034 J**
SG-08	5.5-6	1.8	2/7/2020	<0.00038	<0.00053	<0.00075	**0.0014 J**
SG-09	0.5-1	--	2/3/2020	<0.00052	<0.00074	<0.0010	**0.0042**
SG-09	5.5-6	0.5	2/3/2020	<0.00082	<0.0012	<0.0016	<0.00072
SG-10	0.5-1	0.3	2/7/2020	<0.00052	<0.00072	<0.0010	**0.0056**
SG-10	5.5-6	1.1	2/7/2020	<0.00039	<0.00054	<0.00077	<0.00072
SG-11	0.5-1	0.4	2/6/2020	<0.00070	<0.00098	<0.0014	**0.0084 J**
SG-11	5.5-6	0.5	2/6/2020	<0.00032	<0.00045	<0.00064	**0.0011 J**
SG-12	0.5-1	0	2/17/2020	<0.00062	<0.00087	<0.0012	**0.0039**
SG-12	5.5-6	0	2/17/2020	<0.00060	<0.00084	<0.0012	<0.00071
SG-13	0.5-1	--	2/3/2020	<0.00076	<0.0011	<0.0015	<0.00075
SG-13	5.5-6	--	2/3/2020	<0.00049	<0.00068	<0.00097	<0.00071
SG-14	0.5-1	0	2/17/2020	<0.00030	<0.00042	<0.00061	**0.0027 J**
SG-14	5.5-6	0	2/17/2020	<0.00037	<0.00051	<0.00073	<0.00077
SG-15	0.5-1	0.2	2/13/2020	<0.00050	<0.00070	<0.0010	**0.014**
SG-15	5.5-6	0.1	2/13/2020	<0.00032	<0.00045	<0.00065	<0.00071
SG-16	0.5-1	0.1	2/13/2020	<0.00066	<0.00093	<0.0013	**0.0099**
SG-16	5.5-6	0	2/13/2020	<0.00068	<0.00095	<0.0014	<0.00071
SG-17	0.5-1	0	2/12/2020	<0.00071	<0.0010	<0.0014	**0.0095**
SG-17	5.5-6	0	2/12/2020	<0.00079	<0.0011	<0.0016	**0.0015 J**
SG-18	0.5-1	--	2/3/2020	**0.0034 J**	**0.0034 J**	**0.0056**	<0.00069
SG-18	5.5-6	--	2/3/2020	<0.00054	<0.00076	<0.0011	**0.0041**
SG-19	0.5-1	0	2/12/2020	<0.00059	<0.00082	<0.0012	<0.00069
SG-19 (DUP)	0.5-1	0	2/12/2020	<0.00060	<0.00083	<0.0012	**0.0053**
SG-19	5.5-6	0	2/12/2020	<0.00062	<0.00087	<0.0012	<0.00071
SG-20	0.5-1	0	2/11/2020	<0.00080	<0.0011	<0.0016	<0.00069
SG-20	5.5-6	0	2/11/2020	<0.00072	<0.0010	<0.0014	<0.00071
SG-21	0.5-1	0	1/29/2020	<0.00088	<0.0012	<0.0018	**0.022**
SG-21	5.5-6	0	1/29/2020	<0.00053	<0.00074	<0.0011	**0.01**
SG-22	0.5-1	0	1/29/2020	<0.00061	<0.00085	<0.0012	**0.14**
SG-22	5.5-6	0	1/29/2020	<0.00056	<0.00079	<0.0011	<0.00072
SG-13R	0.5-1	0	6/18/2020	<0.00053	<0.00075	<0.0011	<0.00074
SG-13R	5.5-6	0	6/18/2020	<0.00044	<0.00062	<0.00089	<0.00073
SG-23	0.5-1	0.1	6/18/2020	<0.00031	<0.00044	<0.00062	**0.00071 J**
SG-23	5.5-6	0	6/18/2020	<0.00032	<0.00044	<0.00064	<0.00071
SG-24	0.5-1	0	6/18/2020	<0.00038	<0.00053	<0.00076	**0.001 J**
SG-24	5.5-6	0	6/18/2020	<0.00030	<0.00043	<0.00061	<0.00069
SG-25	0.5-1	0.1	6/18/2020	<0.00068	<0.00095	<0.0014	**0.0046**
SG-25	5.5-6	0	6/18/2020	<0.00030	<0.00042	<0.00059	<0.0070
SG-26	0.5-1	0	6/19/2020	<0.00046	<0.00064	<0.00092	**0.0039**
SG-26	5.5-6	0	6/19/2020	<0.00039	<0.00054	<0.00077	<0.00069
SG-27	0.5-1	0	6/19/2020	<0.00039	<0.00054	<0.00077	**0.0018 J**
SG-27	5.5-6	0	6/19/2020	<0.00069	<0.00097	<0.0014	**0.0022 J**

Notes:
1. TCEQ Texas Risk Reduction Program (TRRP) Tier 1 Residential Assessment level (RAL) based on lowest of Soil PCLs $^{GW}Soil_{Ina}$ or $^{Tot}Soil_{Comb}$ (assuming 30 acre source area).
2. Bolded concentrations are greater than the sample detection limit (SDL).
3. J = Result is estimated due to a detected concentration that is less than the MQL but greater than or equal to the SDL.
4. -- = Not Applicable / Not Analyzed.
5. Concentrations in milligrams per kilogram (mg/kg).

Table 2

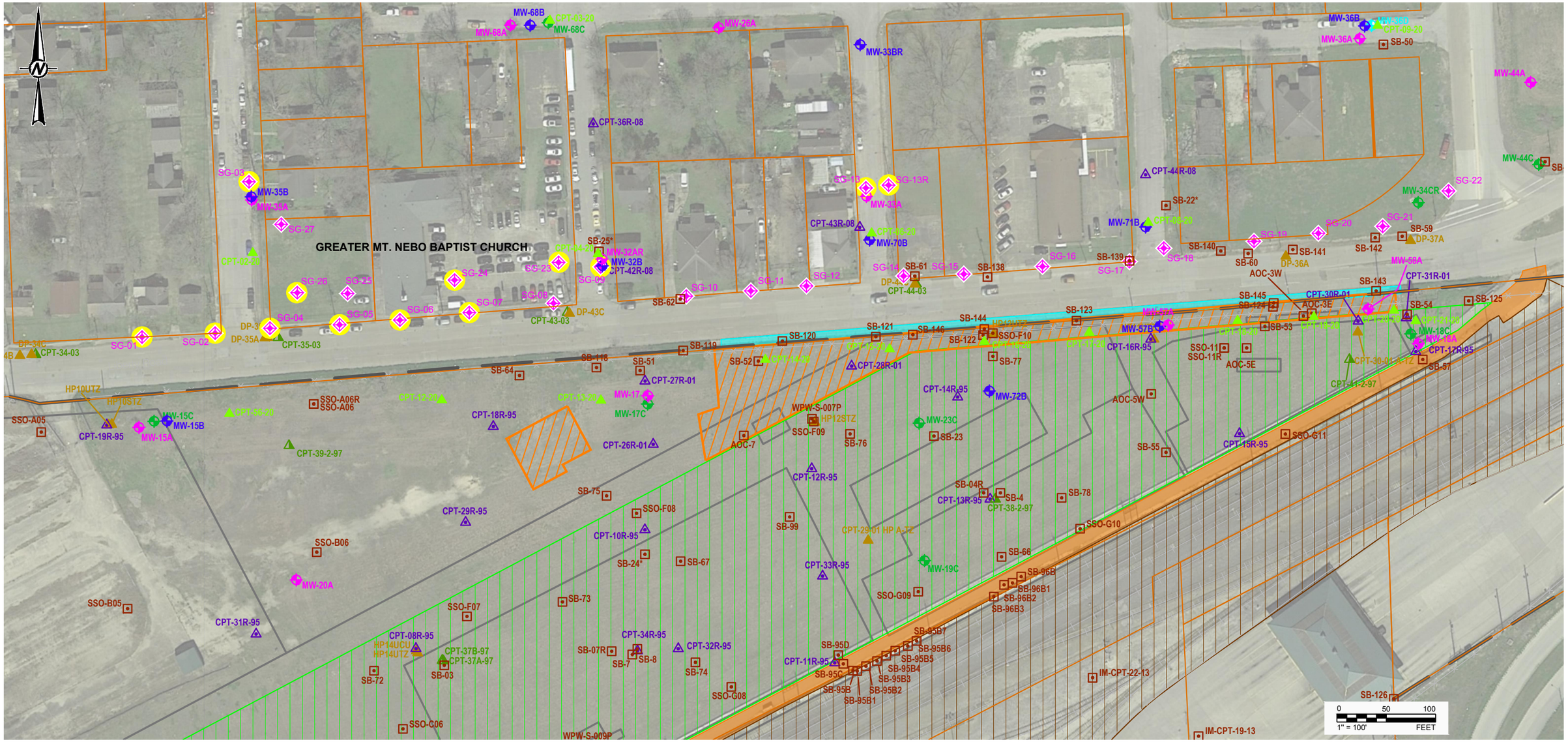
Summary of Soil Gas Analytical Results
UPRR Houston Wood Preserving Works

Sample Location	Sample Date	Benzene	Ethylbenzene	m&p-Xylene	o-Xylene	Naphthalene
	$^{Air}RBEL_{Inh}$ (ug/m^3)	11	2000	640	640	3.1
Target Soil Gas Assessment Level** (ug/m^3)		*367*	*66,667*	*21,333*	*21,333*	*103*
Soil Gas Samples						
SG-08	2/19/2020	**0.31 J**	**0.63 J**	**2.4 J**	**0.81 J**	<2.3
SG-10	2/19/2020	<0.26	**0.54 J**	**2.1 J**	**0.69 J**	<2.2
SG-11	2/19/2020	**0.87**	**5.1**	**13.1**	**7.6**	**3.8 J**
SG-12	2/27/2020	**0.28 J**	<0.54	**1.3 J**	<0.61	<3.1
SG-14	2/27/2020	<0.27	<0.54	<1.2	<0.61	<2.3
SG-15	2/27/2020	<0.26	<0.51	<1.2	<0.58	<3.4
SG-16	2/27/2020	<0.26	**13.4**	**46.9**	**20.9**	<3.1
SG-16 (DUP)	2/27/2020	**0.58**	**14**	**50.6**	**21.5**	<3.2
SG-17	2/27/2020	**0.25 J**	<0.48	**1.1 J**	<0.54	<3.0
SG-18	2/19/2020	**1**	**3.9**	**8**	**3.7**	<2.2
SG-19	2/27/2020	**0.46 J**	<0.51	**1.6 J**	**0.91 J**	<3.5
SG-20	2/27/2020	**0.27 J**	<0.53	**1.7 J**	<0.60	<3.1
SG-21	2/19/2020	<0.26	<0.51	<1.2	<0.58	<2.2
SG-21 (DUP)	2/19/2020	<0.26	<0.51	<1.2	<0.58	<2.2
SG-22	2/19/2020	<0.26	**0.82 J**	**2.5 J**	**0.81 J**	<2.2
SG-25	6/30/2020	<0.25	<0.32	<0.74	<0.34	<2.4
SG-27	6/30/2020	**12.4 J**	**7.9 J**	**21.2 J**	**6.2 J**	<2.3
SG-27 (DUP)	6/30/2020	**1.5 J**	**2.2 J**	**7.7 J**	**3.1 J**	<2.3
Control Samples						
AA-1	2/19/2020	**0.73**	<0.38	<0.88	<0.43	<1.7
AA-2	2/27/2020	**1.1**	<0.37	**0.99 J**	<0.42	<1.6
HE-1	2/19/2020	**5.6**	**3.8**	**22**	**21.2**	<1.3
AA-3	6/30/2020	<0.18	<0.23	<0.53	<0.24	<1.7

Notes:

1. Bolded concentrations are greater than the method detection limit (MDL).
2. ** Target soil gas assessment levels calculated by dividing the $^{Air}RBEL_{Inh}$ (Table 9 TRRP PCL Tables last revised November 8, 2019) by the soil gas attenuation factor of 0.03 (EPA, 2015b)
3. J = Result is estimated due to a detected concentration that is less than the MQL but greater than or equal to the SDL or as indicated in data usability summaries.
4. One method blank yielded a low level detection for naphthalene in lab report 10510405. Associated sample results with similar detections to the method blank were qualified as non-detect (see Data Usability Summary in Attachment 2 for details).
5. Concentrations in micrograms per cubic meter (ug/m^3).

FIGURES



LEGEND

- UPRR PROPERTY BOUNDARY
- FENCE
- RAILROAD
- A-TZ MONITORING WELL LOCATION
- B-CZ/B-TZ MONITORING WELL LOCATION
- C-TZ MONITORING WELL LOCATION
- D-TZ MONITORING WELL LOCATION
- CPT WITH ROST LOCATION
- CPT LOCATION
- HYDROPUNCH SAMPLE LOCATION
- CPT WITH TarGOST LOCATION (2020)
- SOIL BORING LOCATION
- SOIL CAP AREA (20016)
- ASPHALT CAP AREA
- CONCRETE SIDEWALK CAP AREA
- RAILROAD CAP AREA
- SURFACE SOIL EXCAVATION AREA (2016)
- SOIL GAS AND SURFACE SOIL SAMPLE LOCATION
- SOIL GAS AND SURFACE SOIL SAMPLE LOCATION (SOIL GAS SAMPLE POINT SATURATED WITH WATER)

NOTE(S)

1. * SOIL ANALYTICAL DATA REJECTED BY VALIDATOR.

REFERENCE(S)

BASE MAP TAKEN FROM ERM-SOUTHWEST, INC APAR ADDENDUM, FIG 3-1, DATED JUNE 2004.
AERIAL: GOOGLE EARTH, IMAGERY DATED 2/23/19.

CLIENT
UNION PACIFIC RAILROAD CO.

PROJECT
HOUSTON WOOD PRESERVING WORKS

TITLE
SOIL GAS & SURFACE SOIL SAMPLING LOCATIONS

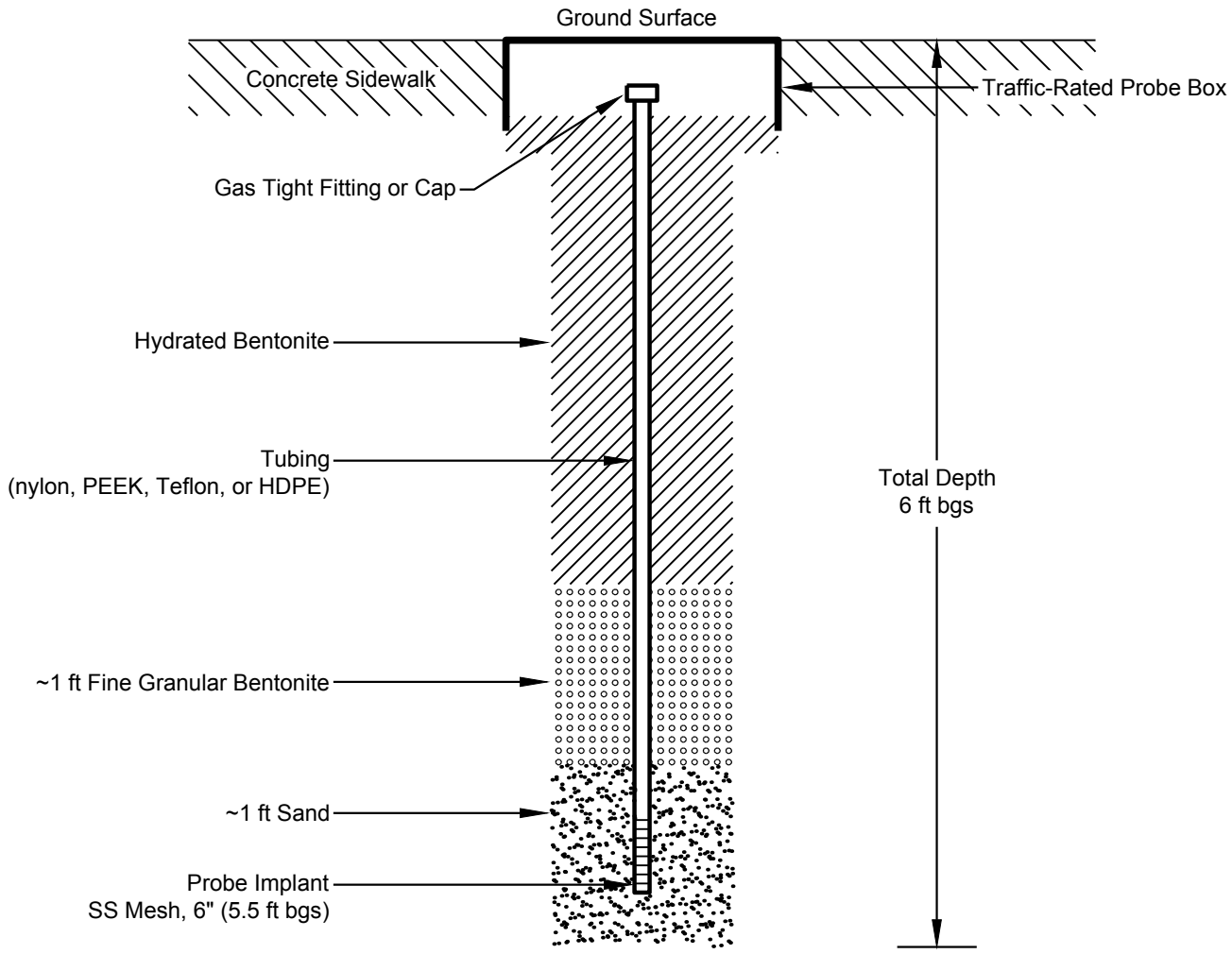
CONSULTANT
GOLDER

YYYY-MM-DD	2020-07-01
DESIGNED	AJD
PREPARED	AJD
REVIEWED	MH
APPROVED	ECM

PROJECT NO. 19119232 | REV. 0 | FIGURE 1

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

Path: \\exarhana\data\Projects - Round Rock\ 19191\19119232 - HWPW\2020-3 March\ | File Name: FIG 1 - Soil Gas Sampling Locations.dwg | Last Edited By: rsalazar Date: 2020-07-01 Time:11:31:50 AM | Printed By: RSalazar Date: 2020-07-01 Time:2:54:47 PM



CLIENT
UNION PACIFIC RAILROAD CO.

PROJECT
HOUSTON WOOD PRESERVING WORKS

TITLE
SOIL GAS PROBE CONSTRUCTION DIAGRAM

CONSULTANT
GOLDER

YYYY-MM-DD	2019-12-20
DESIGNED	AJD
PREPARED	AJD
REVIEWED	ECM
APPROVED	ECM

PROJECT NO. 19119232 | REV. 0 | FIGURE 2

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

0 1 in

Last Edited By: adiamond Date: 2019-12-20 Time:8:26:38 AM | Printed By: adiamond Date: 2019-12-20 Time:3:05:23 PM
Path: \\texarkanadata\Projects - Round Rock_2019\19119232 - HWPW\2019-9 Sept\ | File Name: FIG 2 - Soil Gas Probe Diagram.dwg

ATTACHMENT 1

Soil Samples - Data Usability Summary and Laboratory Analytical Reports

Memorandum

March 5, 2020
Revision: March 31, 2020

To:	Eric Matzner	Ref. No.:	11183954-1620
From:	Chris G. Knight/eew/554-NF	Tel:	512-506-8803
cc:	Jesse Orth, Jon Lang; Julie Lidstone		

Subject: **Data Usability Summary**
Soil Gas Probes
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works
Houston, Texas
January-February 2020

1. Scope of Data Usability Study

This document details a Data Usability Summary (DUS) of analytical results for soil samples collected in support of the Soil Gas Probes at the Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works site during January-February 2020. Samples were submitted to ALS Environmental (ALS), located in Houston, Texas and are reported in data packages HS20011451, HS20020120, HS20020243, HS20020308, HS20020445, HS20020506, HS20020571, and HS20020741. The intended use of the data is to support the Soil Gas Probes 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), field quality assurance/quality control samples (QA/QC), the laboratory review checklists (LRC), and the laboratory exception reports (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 duplicate sample sets 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 analyses.

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 exceptions:

i) HS20011451 - Sample container count differs. The chain of custody states 5 sample containers were submitted, but the laboratory only received 4 sample containers. All 2 oz. amber bottles were received empty. No further action was required.

ii) HS20020120 - Sample container count differs. The chain of custody states 5 sample containers were submitted, but the laboratory only received 4 sample containers. All 2 oz. amber bottles were received empty. No further action was required. Per M. Hermiston, SG-3 samples were placed on hold; and will be re-collected.

iii) HS20020243 - Sample container count differs. The chain of custody states 5 sample containers were submitted, but the laboratory only received 4 sample containers. All 2 oz. amber bottles were received empty. No further action was required.

iv) HS20020445 - Sample container count differs. The chain of custody states 5 sample containers were submitted, but the laboratory only received 4 sample containers. All 2 oz. amber bottles were received empty. No further action was required.

v) HS20020506 - This report was revised. The sample collection date for the field duplicate sample was changed from 2/11/2020 to 2/12/2020. No further action was required.

vi) HS20020741 - Sample container count differs. The chain of custody states 5 sample containers were submitted, but the laboratory only received 4 sample containers. All 2 oz. amber bottles were received empty. No further action was required.

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

The sample chain of custody documents and the analytical reports 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 packages.

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 packages.

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 packages. All internal standard recoveries associated with the compounds of interest were acceptable per the LRC with the following exceptions:

i) SO-1620-SG10(0.5-1)20200207 was reported with one or more of the semi-volatile organic compounds (SVOCs) internal standards were recovered at less than fifty percent. The target compound naphthalene was not associated with the failing internal standards. No further action was required.

ii) SO-1620-SG02(0.5-1) 20200210 and SO-1620-FD01-20200212 were reported with the internal standard Perylene-d12 shifted due to possible matrix effect. The target compound naphthalene was not associated with the failing internal standards. No further action was required.

In accordance with the methods employed, all samples, blanks, and QC samples analyzed for volatile organic compounds (VOCs) and naphthalene 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 methods. 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 methods. All percent recoveries and the RPD value were within the laboratory control limits, demonstrating acceptable analytical accuracy and precision.

The laboratory also performed additional MS/MSD on non-site samples. These cannot be used to assess accuracy and precision for the site samples.

4.8 Field QA/QC Samples

The field QA/QC consisted of two field duplicate sample sets.

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 fifty percent for soil 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. SO-1620-DUP1-2020203 was not assessed; the parent sample was not analyzed. No further action was required.

4.9 Field Procedures

Golder Associates, Inc. collected soil 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.

i) The following sample extracts were analyzed at an elevated sample dilution for naphthalene due to a high level of matrix interference: SO-1620-SG11(0.5-1) 20200206, SO-1620-SG07(0.5-1)20200217 and SO-1620-SG06(0.5-1)20200217. No further action was required.

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

All soil results were reported on a dry weight basis.

5. Conclusion

Based on the assessment detailed in the foregoing, the data summarized in Table 2 are usable for the purpose of supporting the Soil Gas Probes at the site by providing current concentration of chemicals of concern in soil samples without qualification.

Table 1

Sample Collection and Analysis Summary
Soil Gas Probes
Union Pacific Railroad (UPRR)/Houston, TX-Wood Preserving Works
Houston, Texas
January-February 2020

								Analysis/Parameters		
Work Order	**Sample Identification**	**Location**	**Matrix**	**Initial Sample Depth (ft bgs)**	**Final Sample Depth (ft bgs)**	**Collection Date (mm/dd/yyyy)**	**Collection Time (hr:min)**	**VOCs**	**Naphthalene**	**Comments**
HS20011451	SO-1620-SG22 (0.5-1) 20200129	SG22	Soil	0.5	1	01/29/2020	09:45	X	X	
	SO-1620-SG22 (5.5-6) 20200129	SG22	Soil	5.5	6	01/29/2020	10:30	X	X	
	SO-1620-SG21 (0.5-1) 20200129	SG21	Soil	0.5	1	01/29/2020	11:30	X	X	
	SO-1620-SG21 (5.5-6) 20200129	SG21	Soil	5.5	6	01/29/2020	14:15	X	X	
HS20020120	SO-1620-SG-18(0.5-1)-2020203	SG18	Soil	0.5	1	02/03/2020	09:45	X	X	
	SO-1620-SG-18(5.5-6)-2020203	SG18	Soil	5.5	6	02/03/2020	10:00	X	X	
	SO-1620-SG-9(0.5-1)-2020203	SG09	Soil	0.5	1	02/03/2020	11:00	X	X	
	SO-1620-SG-9(5.5-6)-2020203	SG09	Soil	5.5	6	02/03/2020	11:35	X	X	
	SO-1620-SG-13(0.5-1)-2020203	SG13	Soil	0.5	1	02/03/2020	14:15	X	X	
	SO-1620-SG-13(5.5-6)-2020203	SG13	Soil	5.5	6	02/03/2020	14:45	X	X	
	SO-1620-DUP1-2020203	SG03	Soil	5.5	6	02/03/2020	12:40	X	X	
HS20020243	SO-1620-SG03(0.5-1) 20200205	SG03	Soil	0.5	1	02/05/2020	10:30	X	X	
	SO-1620-SG03(5.5-6) 20200205	SG03	Soil	5.5	6	02/05/2020	10:45	X	X	
	SO-1620-SG11(0.5-1) 20200206	SG11	Soil	0.5	1	02/06/2020	13:40	X	X	
	SO-1620-SG11(5.5-6) 20200206	SG11	Soil	5.5	6	02/06/2020	14:00	X	X	MS/MSD-P
HS20020308	SO-1620-SG10(0.5-1)20200207	SG10	Soil	0.5	1	02/07/2020	11:10	X	X	
	SO-1620-SG10(5.5-6)20200207	SG10	Soil	5.5	6	02/07/2020	11:30	X	X	
	SO-1620-SG08(0.5-1)20200207	SG08	Soil	0.5	1	02/07/2020	14:00	X	X	
	SO-1620-SG08(5.5-6)20200207	SG08	Soil	5.5	6	02/07/2020	14:20	X	X	

Table 1

Sample Collection and Analysis Summary
Soil Gas Probes
Union Pacific Railroad (UPRR)/Houston, TX-Wood Preserving Works
Houston, Texas
January-February 2020

								Analysis/Parameters		
Work Order	**Sample Identification**	**Location**	**Matrix**	**Initial Sample Depth (ft bgs)**	**Final Sample Depth (ft bgs)**	**Collection Date (mm/dd/yyyy)**	**Collection Time (hr:min)**	**VOCs**	**Naphthalene**	**Comments**
HS20020445	SO-1620-SG05(0.5-1) 20200210	SG05	Soil	0.5	1	02/10/2020	09:50	X	X	
	SO-1620-SG05(5.5-6) 20200210	SG05	Soil	5.5	6	02/10/2020	10:10	X	X	
	SO-1620-SG04(0.5-1) 20200210	SG04	Soil	0.5	1	02/10/2020	13:20	X	X	
	SO-1620-SG04(5.5-6) 20200210	SG04	Soil	5.5	6	02/10/2020	13:30	X	X	
	SO-1620-SG02(0.5-1) 20200210	SG02	Soil	0.5	1	02/10/2020	15:50	X	X	
	SO-1620-SG02(5.5-6) 20200210	SG02	Soil	5.5	6	02/10/2020	16:00	X	X	
HS20020506	SO-1620-SG01(0.5-1)-20200211	SG01	Soil	0.5	1	02/11/2020	11:50	X	X	
	SO-1620-SG01(5.5-6)-20200211	SG01	Soil	5.5	6	02/11/2020	12:10	X	X	
	SO-1620-SG20(0.5-1)-20200211	SG20	Soil	0.5	1	02/11/2020	15:00	X	X	
	SO-1620-SG20(5.5-6)-20200211	SG20	Soil	5.5	6	02/11/2020	15:20	X	X	
	SO-1620-SG19(0.5-1)-20200212	SG19	Soil	0.5	1	02/12/2020	11:20	X	X	
	SO-1620-FD01-20200212	SG19	Soil	5.5	6	02/12/2020	11:20	X	X	Field duplicate of SG19 (0.5-1)
	SO-1620-SG19(5.5-6)-20200212	SG19	Soil	5.5	6	02/12/2020	11:35	X	X	
HS20020571	SO-1620-SG17(0.5-1)20200212	SG17	Soil	0.5	1	02/12/2020	15:40	X	X	
	SO-1620-SG17(5.5-6)20200212	SG17	Soil	5.5	6	02/12/2020	15:50	X	X	
	SO-1620-SG16(0.5-1)20200213	SG16	Soil	0.5	1	02/13/2020	12:15	X	X	
	SO-1620-SG16(5.5-6)20200213	SG16	Soil	5.5	6	02/13/2020	12:30	X	X	
	SO-1620-SG15(0.5-1)20200213	SG15	Soil	0.5	1	02/13/2020	14:30	X	X	
	SO-1620-SG15(5.5-6)20200213	SG15	Soil	5.5	6	02/13/2020	14:40	X	X	

Table 1

Sample Collection and Analysis Summary
Soil Gas Probes
Union Pacific Railroad (UPRR)/Houston, TX-Wood Preserving Works
Houston, Texas
January-February 2020

								Analysis/Parameters		
Work Order	**Sample Identification**	**Location**	**Matrix**	**Initial Sample Depth (ft bgs)**	**Final Sample Depth (ft bgs)**	**Collection Date (mm/dd/yyyy)**	**Collection Time (hr:min)**	**VOCs**	**Naphthalene**	**Comments**
HS20020741	SO-1620-SG12(0.5-1)20200217	SG12	Soil	0.5	1	02/17/2020	09:11	X	X	
	SO-1620-SG12(5.5-6)20200217	SG12	Soil	5.5	6	02/17/2020	09:30	X	X	
	SO-1620-SG07(0.5-1)20200217	SG07	Soil	0.5	1	02/17/2020	10:50	X	X	
	SO-1620-SG07(5.5-6)20200217	SG07	Soil	5.5	6	02/17/2020	11:10	X	X	
	SO-1620-SG06(0.5-1)20200217	SG06	Soil	0.5	1	02/17/2020	14:00	X	X	
	SO-1620-SG06(5.5-6)20200217	SG06	Soil	5.5	6	02/17/2020	14:15	X	X	
	SO-1620-SG14(0.5-1)20200217	SG14	Soil	0.5	1	02/17/2020	16:15	X	X	
	SO-1620-SG14(5.5-6)20200217	SG14	Soil	5.5	6	02/17/2020	16:30	X	X	

Notes:

ft bgs - Feet Below Ground Surface
VOCs - Volatile Organic Compounds
MS/MSD-P - Matrix Spike/ Matrix Spike Duplicate (partial parameters)

Table 2

Analytical Results Summary
Soil Gas Probes
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works
Houston, Texas
January-February 2020

Location ID:		**SG01**	**SG01**	**SG02**	**SG02**	**SG03**
Sample Name:		**SO-1620-SG01(0.5-1)-20200211**	**SO-1620-SG01(5.5-6)-20200211**	**SO-1620-SG02(0.5-1) 20200210**	**SO-1620-SG02(5.5-6) 20200210**	**SO-1620-DUP1-2020203**
Sample Date:		**02/11/2020**	**02/11/2020**	**02/10/2020**	**02/10/2020**	**02/03/2020**
Depth:		**0.5-1 ft bgs**	**5.5-6 ft bgs**	**0.5-1 ft bgs**	**5.5-6 ft bgs**	**5.5-6 ft bgs**
Parameters	**Unit**					
Volatile Organic Compounds						
Benzene	mg/kg	<0.00059	<0.00082	<0.00053	<0.00037	<0.00040
Ethylbenzene	mg/kg	<0.00082	<0.0011	<0.00075	<0.00051	<0.00056
Xylenes (total)	mg/kg	<0.0012	<0.0016	<0.0011	<0.00073	<0.00080
Semivolatile Organic Compounds						
Naphthalene	mg/kg	<0.00070	<0.00073	0.0024 J	<0.00079	<0.00069

Table 2

Analytical Results Summary
Soil Gas Probes
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works
Houston, Texas
January-February 2020

Location ID:		**SG03**	**SG03**	**SG04**	**SG04**
Sample Name:		**SO-1620-SG03(0.5-1) 20200205**	**SO-1620-SG03(5.5-6) 20200205**	**SO-1620-SG04(0.5-1) 20200210**	**SO-1620-SG04(5.5-6) 20200210**
Sample Date:		**02/05/2020**	**02/05/2020**	**02/10/2020**	**02/10/2020**
Depth:		**0.5-1 ft bgs**	**5.5-6 ft bgs**	**0.5-1 ft bgs**	**5.5-6 ft bgs**
Parameters	**Unit**				
Volatile Organic Compounds					
Benzene	mg/kg	<0.00037	<0.00071	<0.00044	<0.00068
Ethylbenzene	mg/kg	<0.00052	<0.0010	<0.00061	<0.00096
Xylenes (total)	mg/kg	0.0066	<0.0014	<0.00087	<0.0014
Semivolatile Organic Compounds					
Naphthalene	mg/kg	0.0018 J	0.0017 J	<0.00071	<0.00072

Table 2

Analytical Results Summary
Soil Gas Probes
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works
Houston, Texas
January-February 2020

Location ID:		**SG05**	**SG05**	**SG06**	**SG06**	**SG07**
Sample Name:		**SO-1620-SG05(0.5-1) 20200210**	**SO-1620-SG05(5.5-6) 20200210**	**SO-1620-SG06(0.5-1)20200217**	**SO-1620-SG06(5.5-6)20200217**	**SO-1620-SG07(0.5-1)20200217**
Sample Date:		**02/10/2020**	**02/10/2020**	**02/17/2020**	**02/17/2020**	**02/17/2020**
Depth:		**0.5-1 ft bgs**	**5.5-6 ft bgs**	**0.5-1 ft bgs**	**5.5-6 ft bgs**	**0.5-1 ft bgs**
Parameters	**Unit**					
Volatile Organic Compounds						
Benzene	mg/kg	<0.00037	<0.00078	<0.00065	<0.00042	<0.00058
Ethylbenzene	mg/kg	<0.00051	<0.0011	<0.00091	<0.00059	<0.00082
Xylenes (total)	mg/kg	<0.00073	<0.0016	<0.0013	<0.00084	<0.0012
Semivolatile Organic Compounds						
Naphthalene	mg/kg	0.0049	<0.00074	<0.0067	<0.00071	0.0071 J

Table 2

Analytical Results Summary
Soil Gas Probes
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works
Houston, Texas
January-February 2020

Location ID:		**SG07**	**SG08**	**SG08**	**SG09**
Sample Name:		**SO-1620-SG07(5.5-6)20200217**	**SO-1620-SG08(0.5-1)20200207**	**SO-1620-SG08(5.5-6)20200207**	**SO-1620-SG-9(0.5-1)-2020203**
Sample Date:		**02/17/2020**	**02/07/2020**	**02/07/2020**	**02/03/2020**
Depth:		**5.5-6 ft bgs**	**0.5-1 ft bgs**	**5.5-6 ft bgs**	**0.5-1 ft bgs**
Parameters	**Unit**				
Volatile Organic Compounds					
Benzene	mg/kg	<0.00036	<0.00062	<0.00038	<0.00052
Ethylbenzene	mg/kg	<0.00050	<0.00087	<0.00053	<0.00074
Xylenes (total)	mg/kg	<0.00072	<0.0012	<0.00075	<0.0010
Semivolatile Organic Compounds					
Naphthalene	mg/kg	<0.00072	0.0034 J	0.0014 J	0.0042

Table 2

Analytical Results Summary
Soil Gas Probes
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works
Houston, Texas
January-February 2020

Location ID:		**SG09**	**SG10**	**SG10**	**SG11**
Sample Name:		**SO-1620-SG-9(5.5-6)-2020203**	**SO-1620-SG10(0.5-1)20200207**	**SO-1620-SG10(5.5-6)20200207**	**SO-1620-SG11(0.5-1) 20200206**
Sample Date:		**02/03/2020**	**02/07/2020**	**02/07/2020**	**02/06/2020**
Depth:		**5.5-6 ft bgs**	**0.5-1 ft bgs**	**5.5-6 ft bgs**	**0.5-1 ft bgs**
Parameters	**Unit**				
Volatile Organic Compounds					
Benzene	mg/kg	<0.00082	<0.00052	<0.00039	<0.00070
Ethylbenzene	mg/kg	<0.0012	<0.00072	<0.00054	<0.00098
Xylenes (total)	mg/kg	<0.0016	<0.0010	<0.00077	<0.0014
Semivolatile Organic Compounds					
Naphthalene	mg/kg	<0.00072	0.0056	<0.00072	0.0084 J

Notes:

ft bgs - Feet below ground surface
< - Not detected at the associated reporting lim
J - Estimated concentration

Table 2

Analytical Results Summary
Soil Gas Probes
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works
Houston, Texas
January-February 2020

Location ID:		**SG11**	**SG12**	**SG12**	**SG13**
Sample Name:		**SO-1620-SG11(5.5-6) 20200206**	**SO-1620-SG12(0.5-1)20200217**	**SO-1620-SG12(5.5-6)20200217**	**SO-1620-SG-13(0.5-1)-2020203**
Sample Date:		**02/06/2020**	**02/17/2020**	**02/17/2020**	**02/03/2020**
Depth:		**5.5-6 ft bgs**	**0.5-1 ft bgs**	**5.5-6 ft bgs**	**0.5-1 ft bgs**
Parameters	**Unit**				
Volatile Organic Compounds					
Benzene	mg/kg	<0.00032	<0.00062	<0.00060	<0.00076
Ethylbenzene	mg/kg	<0.00045	<0.00087	<0.00084	<0.0011
Xylenes (total)	mg/kg	<0.00064	<0.0012	<0.0012	<0.0015
Semivolatile Organic Compounds					
Naphthalene	mg/kg	0.0011 J	0.0039	<0.00071	<0.00075

Table 2

Analytical Results Summary
Soil Gas Probes
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works
Houston, Texas
January-February 2020

Location ID:		SG13	SG14	SG14	SG15	SG15
Sample Name:		SO-1620-SG-13(5.5-6)-2020203	SO-1620-SG14(0.5-1)20200217	SO-1620-SG14(5.5-6)20200217	SO-1620-SG15(0.5-1)20200213	SO-1620-SG15(5.5-6)20200213
Sample Date:		02/03/2020	02/17/2020	02/17/2020	02/13/2020	02/13/2020
Depth:		5.5-6 ft bgs	0.5-1 ft bgs	5.5-6 ft bgs	0.5-1 ft bgs	5.5-6 ft bgs
Parameters	**Unit**					
Volatile Organic Compounds						
Benzene	mg/kg	<0.00049	<0.00030	<0.00037	<0.00050	<0.00032
Ethylbenzene	mg/kg	<0.00068	<0.00042	<0.00051	<0.00070	<0.00045
Xylenes (total)	mg/kg	<0.00097	<0.00061	<0.00073	<0.0010	<0.00065
Semivolatile Organic Compounds						
Naphthalene	mg/kg	<0.00071	0.0027 J	<0.00077	0.014	<0.00071

Table 2

Analytical Results Summary
Soil Gas Probes
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works
Houston, Texas
January-February 2020

Location ID:		SG16	SG16	SG17	SG17	SG18
Sample Name:		SO-1620-SG16(0.5-1)20200213	SO-1620-SG16(5.5-6)20200213	SO-1620-SG17(0.5-1)20200212	SO-1620-SG17(5.5-6)20200212	SO-1620-SG-18(0.5-1)-2020203
Sample Date:		02/13/2020	02/13/2020	02/12/2020	02/12/2020	02/03/2020
Depth:		0.5-1 ft bgs	5.5-6 ft bgs	0.5-1 ft bgs	5.5-6 ft bgs	0.5-1 ft bgs
Parameters	**Unit**					
Volatile Organic Compounds						
Benzene	mg/kg	<0.00066	<0.00068	<0.00071	<0.00079	0.0034 J
Ethylbenzene	mg/kg	<0.00093	<0.00095	<0.0010	<0.0011	0.0034 J
Xylenes (total)	mg/kg	<0.0013	<0.0014	<0.0014	<0.0016	0.0056
Semivolatile Organic Compounds						
Naphthalene	mg/kg	0.0099	<0.00071	0.0095	0.0015 J	<0.00069

Table 2

Analytical Results Summary
Soil Gas Probes
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works
Houston, Texas
January-February 2020

Location ID:		SG18	SG19	SG19	SG19	SG20
Sample Name:		SO-1620-SG-18(5.5-6)-2020203	SO-1620-SG19(0.5-1)-20200212	SO-1620-FD01-20200212	SO-1620-SG19(5.5-6)-20200212	SO-1620-SG20(0.5-1)-20200211
Sample Date:		02/03/2020	02/12/2020	02/12/2020	02/12/2020	02/11/2020
Depth:		5.5-6 ft bgs	0.5-1 ft bgs	0.5-1 ft bgs Duplicate	5.5-6 ft bgs	0.5-1 ft bgs
Parameters	**Unit**					
Volatile Organic Compounds						
Benzene	mg/kg	<0.00054	<0.00059	<0.00060	<0.00062	<0.00080
Ethylbenzene	mg/kg	<0.00076	<0.00082	<0.00083	<0.00087	<0.0011
Xylenes (total)	mg/kg	<0.0011	<0.0012	<0.0012	<0.0012	<0.0016
Semivolatile Organic Compounds						
Naphthalene	mg/kg	0.0041	<0.00069	0.0053	<0.00071	<0.00069

Table 2

Analytical Results Summary
Soil Gas Probes
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works
Houston, Texas
January-February 2020

Location ID:		SG20	SG21	SG21	SG22	SG22
Sample Name:		SO-1620-SG20(5.5-6)-20200211	SO-1620-SG21 (0.5-1) 20200129	SO-1620-SG21 (5.5-6) 20200129	SO-1620-SG22 (0.5-1) 20200129	SO-1620-SG22 (5.5-6) 20200129
Sample Date:		02/11/2020	01/29/2020	01/29/2020	01/29/2020	01/29/2020
Depth:		5.5-6 ft bgs	0.5-1 ft bgs	5.5-6 ft bgs	0.5-1 ft bgs	5.5-6 ft bgs
Parameters	**Unit**					
Volatile Organic Compounds						
Benzene	mg/kg	<0.00072	<0.00088	<0.00053	<0.00061	<0.00056
Ethylbenzene	mg/kg	<0.0010	<0.0012	<0.00074	<0.00085	<0.00079
Xylenes (total)	mg/kg	<0.0014	<0.0018	<0.0011	<0.0012	<0.0011
Semivolatile Organic Compounds						
Naphthalene	mg/kg	<0.00071	0.022	0.010	0.14	<0.00072

Notes:

ft bgs - Feet below ground surface
< - Not detected at the associated reporting limit
J - Estimated concentration

Table 3

Analytical Methods
Soil Gas Probes
Union Pacific Railroad (UPRR)/Houston, TX-Wood Preserving Works
Houston, Texas
January-February 2020

Parameter	Method	Matrix	Holding Time	
			Collection to Extraction (Days)	Extraction to Analysis (Days)
VOCs	SW-846 8260C	Soil	-	14
Naphthalene	SW-846 8270D	Soil	14	40

Notes:

VOCs - Volatile Organic Compounds
"-" - Not Applicable

Method References:

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

Attachment A
Laboratory NELAP Certificate

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate: T104704231-19-23

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

Expiration Date: 4/30/2020

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

Issue Date: 5/1/2019

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: ***Drinking Water***

Method EPA 1613

Analyte	AB	Analyte ID	Method ID
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	TX	9618	10120408

Method EPA 200.8

Analyte	AB	Analyte ID	Method ID
Copper	TX	1055	10014605
Lead	TX	1075	10014605

Texas Commission on Environmental Quality

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Matrix: ***Non-Potable Water***

Method EPA 1010

Analyte	AB	Analyte ID	Method ID
Ignitability	TX	1780	10116606

Method EPA 120.1

Analyte	AB	Analyte ID	Method ID
Conductivity	TX	1610	10006403

Method EPA 1311

Analyte	AB	Analyte ID	Method ID
TCLP	TX	849	10118806

Method EPA 1312

Analyte	AB	Analyte ID	Method ID
SPLP	TX	850	10119003

Method EPA 160.4

Analyte	AB	Analyte ID	Method ID
Residue-volatile	TX	1970	10010409

Method EPA 1613

Analyte	AB	Analyte ID	Method ID
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	TX	9516	10120408
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	TX	9519	10120408
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	TX	9420	10120408
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	TX	9426	10120408
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	TX	9423	10120408
1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-HxCDF)	TX	9471	10120408
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-HxCDD)	TX	9453	10120408
1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-HxCDF)	TX	9474	10120408
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin(1,2,3,6,7,8-HxCDD)	TX	9456	10120408
1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-HxCDF)	TX	9477	10120408
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-HxCDD)	TX	9459	10120408
1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-PeCDF)	TX	9543	10120408
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD)	TX	9540	10120408
2,3,4,6,7,8-Hexachlorodibenzofuran (2,3,4,6,7,8-HxCDF)	TX	9480	10120408

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Matrix: ***Non-Potable Water***

2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF	TX	9549	10120408
2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	TX	9612	10120408
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	TX	9618	10120408
Total Heptachlorodibenzofuran (Total HpCDF)	TX	9444	10120408
Total Heptachlorodibenzo-p-dioxin (Total HpCDD)	TX	9438	10120408
Total Hexachlorodibenzofuran (Total HxCDF)	TX	9483	10120408
Total Hexachlorodibenzo-p-dioxin (Total HxCDD)	TX	9468	10120408
Total Pentachlorodibenzofuran (Total PeCDF)	TX	9552	10120408
Total Pentachlorodibenzo-p-dioxin (Total PeCDD)	TX	9555	10120408
Total Tetrachlorodibenzofuran (Total TCDF)	TX	9615	10120408
Total Tetrachlorodibenzo-p-dioxin (Total TCDD)	TX	9609	10120408

Method EPA 1664

Analyte	**AB**	**Analyte ID**	**Method ID**
n-Hexane Extractable Material (HEM) (O&G)	TX	1803	10127807

Method EPA 180.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Turbidity	TX	2055	10011606

Method EPA 200.8

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	TX	1000	10014605
Antimony	TX	1005	10014605
Arsenic	TX	1010	10014605
Barium	TX	1015	10014605
Beryllium	TX	1020	10014605
Boron	TX	1025	10014605
Cadmium	TX	1030	10014605
Calcium	TX	1035	10014605
Chromium	TX	1040	10014605
Cobalt	TX	1050	10014605
Copper	TX	1055	10014605
Iron	TX	1070	10014605

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Matrix: ***Non-Potable Water***

Lead	TX	1075	10014605
Magnesium	TX	1085	10014605
Manganese	TX	1090	10014605
Molybdenum	TX	1100	10014605
Nickel	TX	1105	10014605
Potassium	TX	1125	10014605
Selenium	TX	1140	10014605
Silver	TX	1150	10014605
Sodium	TX	1155	10014605
Strontium	TX	1160	10014605
Thallium	TX	1165	10014605
Tin	TX	1175	10014605
Titanium	TX	1180	10014605
Uranium	TX	3035	10014605
Vanadium	TX	1185	10014605
Zinc	TX	1190	10014605

Method EPA 245.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10036609

Method EPA 300.0

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	TX	1540	10053200
Chloride	TX	1575	10053200
Fluoride	TX	1730	10053200
Nitrate as N	TX	1810	10053200
Nitrate-nitrite	TX	1820	10053200
Nitrite as N	TX	1840	10053200
Orthophosphate as P	TX	1870	10053200
Sulfate	TX	2000	10053200

Method EPA 325.1

Analyte	**AB**	**Analyte ID**	**Method ID**

Texas Commission on Environmental Quality

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Houston, TX 77099-4338

Issue Date: 5/1/2019

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Matrix: ***Non-Potable Water***

Chloride	TX	1575	10056801

Method EPA 335.1

Analyte	AB	Analyte ID	Method ID
Amenable cyanide	TX	1510	10060001

Method EPA 335.2

Analyte	AB	Analyte ID	Method ID
Total cyanide	TX	1645	10278203

Method EPA 335.4

Analyte	AB	Analyte ID	Method ID
Total cyanide	TX	1645	10061402

Method EPA 350.3

Analyte	AB	Analyte ID	Method ID
Ammonia as N	TX	1515	10064401

Method EPA 365.3

Analyte	AB	Analyte ID	Method ID
Orthophosphate as P	TX	1870	10070801
Phosphorus	TX	1910	10070801

Method EPA 375.4

Analyte	AB	Analyte ID	Method ID
Sulfate	TX	2000	10073800

Method EPA 376.1

Analyte	AB	Analyte ID	Method ID
Sulfide	TX	2005	10074201

Method EPA 410.4

Analyte	AB	Analyte ID	Method ID
Chemical oxygen demand (COD)	TX	1565	10077404

Method EPA 415.1

Analyte	AB	Analyte ID	Method ID
Total Organic Carbon (TOC)	TX	2040	10078407

Method EPA 420.1

Analyte	AB	Analyte ID	Method ID
Total phenolics	TX	1905	10079400

Texas Commission on Environmental Quality

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Expiration Date: 4/30/2020

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Issue Date: 5/1/2019

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Matrix: ***Non-Potable Water***

Method EPA 420.4

Analyte	AB	Analyte ID	Method ID
Total phenolics	TX	1905	10080203

Method EPA 6020

Analyte	AB	Analyte ID	Method ID
Aluminum	TX	1000	10156419
Antimony	TX	1005	10156419
Arsenic	TX	1010	10156419
Barium	TX	1015	10156419
Beryllium	TX	1020	10156419
Boron	TX	1025	10156419
Cadmium	TX	1030	10156419
Calcium	TX	1035	10156419
Chromium	TX	1040	10156419
Cobalt	TX	1050	10156419
Copper	TX	1055	10156419
Iron	TX	1070	10156419
Lead	TX	1075	10156419
Lithium	TX	1080	10156419
Magnesium	TX	1085	10156419
Manganese	TX	1090	10156419
Molybdenum	TX	1100	10156419
Nickel	TX	1105	10156419
Potassium	TX	1125	10156419
Selenium	TX	1140	10156419
Silver	TX	1150	10156419
Sodium	TX	1155	10156419
Strontium	TX	1160	10156419
Thallium	TX	1165	10156419
Tin	TX	1175	10156419
Titanium	TX	1180	10156419

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Issue Date: 5/1/2019

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Matrix: ***Non-Potable Water***

Vanadium	TX	1185	10156419
Zinc	TX	1190	10156419

Method EPA 608

Analyte	AB	Analyte ID	Method ID
4,4'-DDD	TX	7355	10103603
4,4'-DDE	TX	7360	10103603
4,4'-DDT	TX	7365	10103603
Aldrin	TX	7025	10103603
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10103603
alpha-Chlordane	TX	7240	10103603
Aroclor-1016 (PCB-1016)	TX	8880	10103603
Aroclor-1221 (PCB-1221)	TX	8885	10103603
Aroclor-1232 (PCB-1232)	TX	8890	10103603
Aroclor-1242 (PCB-1242)	TX	8895	10103603
Aroclor-1248 (PCB-1248)	TX	8900	10103603
Aroclor-1254 (PCB-1254)	TX	8905	10103603
Aroclor-1260 (PCB-1260)	TX	8910	10103603
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10103603
Chlordane (tech.)	TX	7250	10103603
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10103603
Dieldrin	TX	7470	10103603
Endosulfan I	TX	7510	10103603
Endosulfan II	TX	7515	10103603
Endosulfan sulfate	TX	7520	10103603
Endrin	TX	7540	10103603
Endrin aldehyde	TX	7530	10103603
Endrin ketone	TX	7535	10103603
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10103603
gamma-Chlordane	TX	7245	10103603
Heptachlor	TX	7685	10103603

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Matrix: ***Non-Potable Water***

Heptachlor epoxide	TX	7690	10103603
Methoxychlor	TX	7810	10103603
Toxaphene (Chlorinated camphene)	TX	8250	10103603

Method EPA 624

Analyte	AB	Analyte ID	Method ID
1,1,1-Trichloroethane	TX	5160	10107207
1,1,2,2-Tetrachloroethane	TX	5110	10107207
1,1,2-Trichloroethane	TX	5165	10107207
1,1-Dichloroethane	TX	4630	10107207
1,1-Dichloroethylene	TX	4640	10107207
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10107207
1,2-Dichlorobenzene	TX	4610	10107207
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10107207
1,2-Dichloropropane	TX	4655	10107207
1,3-Dichlorobenzene	TX	4615	10107207
1,4-Dichlorobenzene	TX	4620	10107207
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10107207
2-Chloroethyl vinyl ether	TX	4500	10107207
Acetone (2-Propanone)	TX	4315	10107207
Acrolein (Propenal)	TX	4325	10107207
Acrylonitrile	TX	4340	10107207
Benzene	TX	4375	10107207
Bromodichloromethane	TX	4395	10107207
Bromoform	TX	4400	10107207
Carbon tetrachloride	TX	4455	10107207
Chlorobenzene	TX	4475	10107207
Chlorodibromomethane	TX	4575	10107207
Chloroethane (Ethyl chloride)	TX	4485	10107207
Chloroform	TX	4505	10107207
cis-1,2-Dichloroethylene	TX	4645	10107207

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cis-1,3-Dichloropropene	TX	4680	10107207
Ethylbenzene	TX	4765	10107207
m+p-xylene	TX	5240	10107207
Methyl bromide (Bromomethane)	TX	4950	10107207
Methyl chloride (Chloromethane)	TX	4960	10107207
Methyl tert-butyl ether (MTBE)	TX	5000	10107207
Methylene chloride (Dichloromethane)	TX	4975	10107207
Naphthalene	TX	5005	10107207
o-Xylene	TX	5250	10107207
Tetrachloroethylene (Perchloroethylene)	TX	5115	10107207
Toluene	TX	5140	10107207
trans-1,2-Dichloroethylene	TX	4700	10107207
trans-1,3-Dichloropropylene	TX	4685	10107207
Trichloroethene (Trichloroethylene)	TX	5170	10107207
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10107207
Vinyl chloride	TX	5235	10107207
Xylene (total)	TX	5260	10107207

Method EPA 625

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2,4,5-Tetrachlorobenzene	TX	6715	10107401
1,2,4-Trichlorobenzene	TX	5155	10107401
1,2-Dichlorobenzene	TX	4610	10107401
1,2-Diphenylhydrazine	TX	6220	10107401
1,3-Dichlorobenzene	TX	4615	10107401
1,4-Dichlorobenzene	TX	4620	10107401
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10107401
2,4,5-Trichlorophenol	TX	6835	10107401
2,4,6-Trichlorophenol	TX	6840	10107401
2,4-Dichlorophenol	TX	6000	10107401
2,4-Dimethylphenol	TX	6130	10107401

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Matrix: ***Non-Potable Water***

2,4-Dinitrophenol	TX	6175	10107401
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10107401
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10107401
2-Chloronaphthalene	TX	5795	10107401
2-Chlorophenol	TX	5800	10107401
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10107401
2-Methylphenol (o-Cresol)	TX	6400	10107401
2-Nitrophenol	TX	6490	10107401
3,3'-Dichlorobenzidine	TX	5945	10107401
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10107401
4-Chloro-3-methylphenol	TX	5700	10107401
4-Chlorophenyl phenylether	TX	5825	10107401
4-Methylphenol (p-Cresol)	TX	6410	10107401
4-Nitrophenol	TX	6500	10107401
Acenaphthene	TX	5500	10107401
Acenaphthylene	TX	5505	10107401
Anthracene	TX	5555	10107401
Benzidine	TX	5595	10107401
Benzo(a)anthracene	TX	5575	10107401
Benzo(a)pyrene	TX	5580	10107401
Benzo(b)fluoranthene	TX	5585	10107401
Benzo(g,h,i)perylene	TX	5590	10107401
Benzo(k)fluoranthene	TX	5600	10107401
bis(2-Chloroethoxy)methane	TX	5760	10107401
bis(2-Chloroethyl) ether	TX	5765	10107401
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10107401
Butyl benzyl phthalate	TX	5670	10107401
Chrysene	TX	5855	10107401
Dibenz(a,h) anthracene	TX	5895	10107401
Diethyl phthalate	TX	6070	10107401

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Dimethyl phthalate	TX	6135	10107401
Di-n-butyl phthalate	TX	5925	10107401
Di-n-octyl phthalate	TX	6200	10107401
Fluoranthene	TX	6265	10107401
Fluorene	TX	6270	10107401
Hexachlorobenzene	TX	6275	10107401
Hexachlorobutadiene	TX	4835	10107401
Hexachlorocyclopentadiene	TX	6285	10107401
Hexachloroethane	TX	4840	10107401
Indeno(1,2,3-cd) pyrene	TX	6315	10107401
Isophorone	TX	6320	10107401
Naphthalene	TX	5005	10107401
Nitrobenzene	TX	5015	10107401
n-Nitrosodiethylamine	TX	6525	10107401
n-Nitrosodimethylamine	TX	6530	10107401
n-Nitrosodi-n-butylamine	TX	5025	10107401
n-Nitrosodi-n-propylamine	TX	6545	10107401
n-Nitrosodiphenylamine	TX	6535	10107401
Pentachlorobenzene	TX	6590	10107401
Pentachlorophenol	TX	6605	10107401
Phenanthrene	TX	6615	10107401
Phenol	TX	6625	10107401
Pyrene	TX	6665	10107401
Pyridine	TX	5095	10107401

Method EPA 7196

Analyte	**AB**	**Analyte ID**	**Method ID**
Chromium (VI)	TX	1045	10162206

Method EPA 7470

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10165603

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Matrix: ***Non-Potable Water***

Method EPA 8011

Analyte	AB	Analyte ID	Method ID
1,2,3-Trichloropropane	TX	5180	10173009
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10173009
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10173009

Method EPA 8015

Analyte	AB	Analyte ID	Method ID
Diesel range organics (DRO)	TX	9369	10173203
Ethanol	TX	4750	10173203
Ethylene glycol	TX	4785	10173203
Gasoline range organics (GRO)	TX	9408	10173203
Isobutyl alcohol (2-Methyl-1-propanol)	TX	4875	10173203
Isopropyl alcohol (2-Propanol, Isopropanol)	TX	4895	10173203
Methanol	TX	4930	10173203
n-Butyl alcohol (1-Butanol, n-Butanol)	TX	4425	10173203
n-Propanol (1-Propanol)	TX	5055	10173203
Propylene Glycol	TX	6657	10173203
tert-Butyl alcohol	TX	4420	10173203

Method EPA 8021

Analyte	AB	Analyte ID	Method ID
Benzene	TX	4375	10174400
Ethylbenzene	TX	4765	10174400
m+p-xylene	TX	5240	10174400
Methyl tert-butyl ether (MTBE)	TX	5000	10174400
o-Xylene	TX	5250	10174400
Toluene	TX	5140	10174400
Xylene (total)	TX	5260	10174400

Method EPA 8081

Analyte	AB	Analyte ID	Method ID
4,4'-DDD	TX	7355	10178402
4,4'-DDE	TX	7360	10178402

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Matrix: ***Non-Potable Water***

4,4'-DDT	TX	7365	10178402
Aldrin	TX	7025	10178402
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10178402
alpha-Chlordane	TX	7240	10178402
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10178402
Chlordane (tech.)	TX	7250	10178402
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10178402
Dieldrin	TX	7470	10178402
Endosulfan I	TX	7510	10178402
Endosulfan II	TX	7515	10178402
Endosulfan sulfate	TX	7520	10178402
Endrin	TX	7540	10178402
Endrin aldehyde	TX	7530	10178402
Endrin ketone	TX	7535	10178402
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10178402
gamma-Chlordane	TX	7245	10178402
Heptachlor	TX	7685	10178402
Heptachlor epoxide	TX	7690	10178402
Hexachlorobenzene	TX	6275	10178402
Methoxychlor	TX	7810	10178402
Mirex	TX	7870	10178402
Toxaphene (Chlorinated camphene)	TX	8250	10178402

Method EPA 8082

Analyte	**AB**	**Analyte ID**	**Method ID**
Aroclor-1016 (PCB-1016)	TX	8880	10179201
Aroclor-1221 (PCB-1221)	TX	8885	10179201
Aroclor-1232 (PCB-1232)	TX	8890	10179201
Aroclor-1242 (PCB-1242)	TX	8895	10179201
Aroclor-1248 (PCB-1248)	TX	8900	10179201
Aroclor-1254 (PCB-1254)	TX	8905	10179201

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Matrix: ***Non-Potable Water***

Aroclor-1260 (PCB-1260)	TX	8910	10179201
PCBs (total)	TX	8870	10179201

Method EPA 8151

Analyte	AB	Analyte ID	Method ID
2,4,5-T	TX	8655	10183003
2,4-D	TX	8545	10183003
2,4-DB	TX	8560	10183003
Dalapon	TX	8555	10183003
Dicamba	TX	8595	10183003
Dichloroprop (Dichlorprop, Weedone)	TX	8605	10183003
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	TX	8620	10183003
MCPA	TX	7775	10183003
MCPP	TX	7780	10183003
Silvex (2,4,5-TP)	TX	8650	10183003

Method EPA 8260

Analyte	AB	Analyte ID	Method ID
1,1,1,2-Tetrachloroethane	TX	5105	10184404
1,1,1-Trichloroethane	TX	5160	10184404
1,1,2,2-Tetrachloroethane	TX	5110	10184404
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	TX	5195	10184404
1,1,2-Trichloroethane	TX	5165	10184404
1,1-Dichloroethane	TX	4630	10184404
1,1-Dichloroethylene	TX	4640	10184404
1,1-Dichloropropene	TX	4670	10184404
1,2,3-Trichlorobenzene	TX	5150	10184404
1,2,3-Trichloropropane	TX	5180	10184404
1,2,4-Trichlorobenzene	TX	5155	10184404
1,2,4-Trimethylbenzene	TX	5210	10184404
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10184404
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10184404
1,2-Dichlorobenzene	TX	4610	10184404

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Matrix: ***Non-Potable Water***

1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10184404
1,2-Dichloropropane	TX	4655	10184404
1,3,5-Trimethylbenzene	TX	5215	10184404
1,3-Dichlorobenzene	TX	4615	10184404
1,3-Dichloropropane	TX	4660	10184404
1,4-Dichlorobenzene	TX	4620	10184404
1,4-Dioxane (1,4-Diethyleneoxide)	TX	4735	10184404
1-Chlorohexane	TX	4510	10184404
1-Propanol	TX	5060	10184404
2,2-Dichloropropane	TX	4665	10184404
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10184404
2-Chloroethyl vinyl ether	TX	4500	10184404
2-Chlorotoluene	TX	4535	10184404
2-Hexanone (MBK)	TX	4860	10184404
2-Pentanone	TX	5045	10184404
4-Chlorotoluene	TX	4540	10184404
4-Isopropyltoluene (p-Cymene)	TX	4915	10184404
4-Methyl-2-pentanone (MIBK)	TX	4995	10184404
Acetone (2-Propanone)	TX	4315	10184404
Acetonitrile	TX	4320	10184404
Acrolein (Propenal)	TX	4325	10184404
Acrylonitrile	TX	4340	10184404
Allyl alcohol	TX	4350	10184404
Allyl chloride (3-Chloropropene)	TX	4355	10184404
Benzene	TX	4375	10184404
Benzyl chloride	TX	5635	10184404
Bromobenzene	TX	4385	10184404
Bromochloromethane	TX	4390	10184404
Bromodichloromethane	TX	4395	10184404
Bromoform	TX	4400	10184404

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Matrix: ***Non-Potable Water***

Carbon disulfide	TX	4450	10184404
Carbon tetrachloride	TX	4455	10184404
Chlorobenzene	TX	4475	10184404
Chlorodibromomethane	TX	4575	10184404
Chloroethane (Ethyl chloride)	TX	4485	10184404
Chloroform	TX	4505	10184404
Chloroprene (2-Chloro-1,3-butadiene)	TX	4525	10184404
cis-1,2-Dichloroethylene	TX	4645	10184404
cis-1,3-Dichloropropene	TX	4680	10184404
Dibromofluoromethane	TX	4590	10184404
Dibromomethane (Methylene bromide)	TX	4595	10184404
Dichlorodifluoromethane (Freon-12)	TX	4625	10184404
Diethyl ether	TX	4725	10184404
Di-isopropylether (DIPE)	TX	9375	10184404
Epichlorohydrin (1-Chloro-2,3-epoxypropane)	TX	4745	10184404
Ethanol	TX	4750	10184404
Ethyl acetate	TX	4755	10184404
Ethyl methacrylate	TX	4810	10184404
Ethylbenzene	TX	4765	10184404
Ethylene oxide	TX	4795	10184404
Ethyl-t-butylether (ETBE) (2-Ethoxy-2-methylpropane)	TX	4770	10184404
Hexachlorobutadiene	TX	4835	10184404
Iodomethane (Methyl iodide)	TX	4870	10184404
Isobutyl alcohol (2-Methyl-1-propanol)	TX	4875	10184404
Isopropyl alcohol (2-Propanol, Isopropanol)	TX	4895	10184404
Isopropylbenzene (Cumene)	TX	4900	10184404
m+p-xylene	TX	5240	10184404
Methacrylonitrile	TX	4925	10184404
Methyl acetate	TX	4940	10184404
Methyl acrylate	TX	4945	10184404

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Matrix: ***Non-Potable Water***

Methyl bromide (Bromomethane)	TX	4950	10184404
Methyl chloride (Chloromethane)	TX	4960	10184404
Methyl methacrylate	TX	4990	10184404
Methyl tert-butyl ether (MTBE)	TX	5000	10184404
Methylcyclohexane	TX	4965	10184404
Methylene chloride (Dichloromethane)	TX	4975	10184404
Naphthalene	TX	5005	10184404
n-Butyl alcohol (1-Butanol, n-Butanol)	TX	4425	10184404
n-Butylbenzene	TX	4435	10184404
n-Propylbenzene	TX	5090	10184404
o-Xylene	TX	5250	10184404
Pentachloroethane	TX	5035	10184404
Propionitrile (Ethyl cyanide)	TX	5080	10184404
Pyridine	TX	5095	10184404
sec-Butylbenzene	TX	4440	10184404
Styrene	TX	5100	10184404
T-amylmethylether (TAME)	TX	4370	10184404
tert-Butyl alcohol	TX	4420	10184404
tert-Butylbenzene	TX	4445	10184404
Tetrachloroethylene (Perchloroethylene)	TX	5115	10184404
Toluene	TX	5140	10184404
trans-1,2-Dichloroethylene	TX	4700	10184404
trans-1,3-Dichloropropylene	TX	4685	10184404
trans-1,4-Dichloro-2-butene	TX	4605	10184404
Trichloroethene (Trichloroethylene)	TX	5170	10184404
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10184404
Vinyl acetate	TX	5225	10184404
Vinyl chloride	TX	5235	10184404
Xylene (total)	TX	5260	10184404

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Expiration Date: 4/30/2020

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

Issue Date: 5/1/2019

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Matrix: ***Non-Potable Water***

Method EPA 8270

Analyte	AB	Analyte ID	Method ID
1,2,4,5-Tetrachlorobenzene	TX	6715	10185203
1,2,4-Trichlorobenzene	TX	5155	10185203
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10185203
1,2-Dichlorobenzene	TX	4610	10185203
1,2-Dinitrobenzene	TX	6155	10185203
1,2-Diphenylhydrazine	TX	6220	10185203
1,3,5-Trinitrobenzene (1,3,5-TNB)	TX	6885	10185203
1,3-Dichlorobenzene	TX	4615	10185203
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10185203
1,4-Dichlorobenzene	TX	4620	10185203
1,4-Dinitrobenzene	TX	6165	10185203
1,4-Naphthoquinone	TX	6420	10185203
1,4-Phenylenediamine	TX	6630	10185203
1-Chloronaphthalene	TX	5790	10185203
1-Naphthylamine	TX	6425	10185203
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10185203
2,3,4,6-Tetrachlorophenol	TX	6735	10185203
2,4,5-Trichlorophenol	TX	6835	10185203
2,4,5-Trimethylaniline	TX	6880	10185203
2,4,6-Trichlorophenol	TX	6840	10185203
2,4-Diaminotoluene	TX	5880	10185203
2,4-Dichlorophenol	TX	6000	10185203
2,4-Dimethylphenol	TX	6130	10185203
2,4-Dinitrophenol	TX	6175	10185203
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10185203
2,6-Dichlorophenol	TX	6005	10185203
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10185203
2-Acetylaminofluorene	TX	5515	10185203

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Matrix: ***Non-Potable Water***

2-Chloronaphthalene	TX	5795	10185203
2-Chlorophenol	TX	5800	10185203
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10185203
2-Methylaniline (o-Toluidine)	TX	5145	10185203
2-Methylnaphthalene	TX	6385	10185203
2-Methylphenol (o-Cresol)	TX	6400	10185203
2-Naphthylamine	TX	6430	10185203
2-Nitroaniline	TX	6460	10185203
2-Nitrophenol	TX	6490	10185203
2-Picoline (2-Methylpyridine)	TX	5050	10185203
3,3'-Dichlorobenzidine	TX	5945	10185203
3,3'-Dimethylbenzidine	TX	6120	10185203
3-Methylcholanthrene	TX	6355	10185203
3-Methylphenol (m-Cresol)	TX	6405	10185203
3-Nitroaniline	TX	6465	10185203
4-Aminobiphenyl	TX	5540	10185203
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10185203
4-Chloro-3-methylphenol	TX	5700	10185203
4-Chloroaniline	TX	5745	10185203
4-Chlorophenyl phenylether	TX	5825	10185203
4-Dimethyl aminoazobenzene	TX	6105	10185203
4-Methylphenol (p-Cresol)	TX	6410	10185203
4-Nitroaniline	TX	6470	10185203
4-Nitrobiphenyl	TX	6480	10185203
4-Nitrophenol	TX	6500	10185203
4-Nitroquinoline-1-oxide	TX	6510	10185203
5-Chloro-2-methylaniline	TX	5695	10185203
5-Nitro-o-toluidine	TX	6570	10185203
7,12-Dimethylbenz(a) anthracene	TX	6115	10185203
a-a-Dimethylphenethylamine	TX	6125	10185203

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Matrix: ***Non-Potable Water***

Acenaphthene	TX	5500	10185203
Acenaphthylene	TX	5505	10185203
Acetophenone	TX	5510	10185203
Aniline	TX	5545	10185203
Anthracene	TX	5555	10185203
Aramite	TX	5560	10185203
Atrazine	TX	7065	10185203
Azinphos-methyl (Guthion)	TX	7075	10185203
Azobenzene	TX	5562	10185203
Benzenethiol (Thiophenol)	TX	6750	10185203
Benzidine	TX	5595	10185203
Benzo(a)anthracene	TX	5575	10185203
Benzo(a)pyrene	TX	5580	10185203
Benzo(b)fluoranthene	TX	5585	10185203
Benzo(e)pyrene	TX	5605	10185203
Benzo(g,h,i)perylene	TX	5590	10185203
Benzo(k)fluoranthene	TX	5600	10185203
Benzoic acid	TX	5610	10185203
Benzyl alcohol	TX	5630	10185203
Biphenyl	TX	5640	10185203
bis(2-Chloroethoxy)methane	TX	5760	10185203
bis(2-Chloroethyl) ether	TX	5765	10185203
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10185203
Butyl benzyl phthalate	TX	5670	10185203
Caprolactam	TX	7180	10185203
Captan	TX	7190	10185203
Carbaryl (Sevin)	TX	7195	10185203
Carbazole	TX	5680	10185203
Carbophenothion	TX	7220	10185203
Chlorobenzilate	TX	7260	10185203

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Matrix: ***Non-Potable Water***

Chrysene	TX	5855	10185203
Coumaphos	TX	7315	10185203
Demeton	TX	7390	10185203
Demeton	TX	7390	10185203
Demeton-o	TX	7395	10185203
Demeton-s	TX	7385	10185203
Diallate	TX	7405	10185203
Dibenz(a,h) anthracene	TX	5895	10185203
Dibenz(a,j) acridine	TX	5900	10185203
Dibenzofuran	TX	5905	10185203
Dichlorovos (DDVP, Dichlorvos)	TX	8610	10185203
Diethyl phthalate	TX	6070	10185203
Dimethoate	TX	7475	10185203
Dimethoate	TX	7475	10185203
Dimethyl phthalate	TX	6135	10185203
Di-n-butyl phthalate	TX	5925	10185203
Di-n-octyl phthalate	TX	6200	10185203
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	TX	8620	10185203
Dioxathion	TX	7495	10185203
Diphenylamine	TX	6205	10185203
Disulfoton	TX	8625	10185203
Ethion	TX	7565	10185203
Ethyl methanesulfonate	TX	6260	10185203
Famphur	TX	7580	10185203
Fluoranthene	TX	6265	10185203
Fluorene	TX	6270	10185203
Hexachlorobenzene	TX	6275	10185203
Hexachlorobutadiene	TX	4835	10185203
Hexachlorocyclopentadiene	TX	6285	10185203
Hexachloroethane	TX	4840	10185203

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Matrix: ***Non-Potable Water***

Hexachlorophene	TX	6290	10185203
Hexachloropropene	TX	6295	10185203
Indeno(1,2,3-cd) pyrene	TX	6315	10185203
Isodrin	TX	7725	10185203
Isophorone	TX	6320	10185203
Isosafrole	TX	6325	10185203
Kepone	TX	7740	10185203
Maleic anhydride	TX	6335	10185203
Methapyrilene	TX	6345	10185203
Methyl methanesulfonate	TX	6375	10185203
Methyl parathion (Parathion, methyl)	TX	7825	10185203
Mevinphos	TX	7850	10185203
Naled	TX	7905	10185203
Naphthalene	TX	5005	10185203
Nitrobenzene	TX	5015	10185203
n-Nitrosodiethylamine	TX	6525	10185203
n-Nitrosodimethylamine	TX	6530	10185203
n-Nitrosodi-n-butylamine	TX	5025	10185203
n-Nitrosodi-n-propylamine	TX	6545	10185203
n-Nitrosodiphenylamine	TX	6535	10185203
n-Nitrosomethylethylamine	TX	6550	10185203
n-Nitrosomorpholine	TX	6555	10185203
n-Nitrosopiperidine	TX	6560	10185203
n-Nitrosopyrrolidine	TX	6565	10185203
o,o,o-Triethyl phosphorothioate	TX	8290	10185203
o-Anisidine	TX	5550	10185203
Parathion, ethyl	TX	7955	10185203
p-Cresidine	TX	5860	10185203
Pentachlorobenzene	TX	6590	10185203
Pentachloronitrobenzene (PCNB)	TX	6600	10185203

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Matrix: ***Non-Potable Water***

Pentachlorophenol	TX	6605	10185203
Phenacetin	TX	6610	10185203
Phenanthrene	TX	6615	10185203
Phenol	TX	6625	10185203
Phorate	TX	7985	10185203
Phosmet (Imidan)	TX	8000	10185203
Phthalic anhydride	TX	6640	10185203
Pronamide (Kerb)	TX	6650	10185203
Pyrene	TX	6665	10185203
Pyridine	TX	5095	10185203
Quinoline	TX	6670	10185203
Resorcinol	TX	6680	10185203
Safrole	TX	6685	10185203
Sulfotepp	TX	8155	10185203
Terbufos	TX	8185	10185203
Tetrachlorvinphos (Stirophos, Gardona)	TX	8197	10185203
Thionazin (Zinophos)	TX	8235	10185203
Toluene diisocyanate	TX	6775	10185203
Trifluralin (Treflan)	TX	8295	10185203

Method EPA 8290

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	TX	9516	10187209
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	TX	9519	10187209
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	TX	9420	10187209
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	TX	9426	10187209
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	TX	9423	10187209
1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-HxCDF)	TX	9471	10187209
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-HxCDD)	TX	9453	10187209
1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-HxCDF)	TX	9474	10187209
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin(1,2,3,6,7,8-HxCDD)	TX	9456	10187209

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Matrix: ***Non-Potable Water***

1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-HxCDF)	TX	9477	10187209
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-HxCDD)	TX	9459	10187209
1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-PeCDF)	TX	9543	10187209
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD)	TX	9540	10187209
2,3,4,6,7,8-Hexachlorodibenzofuran (2,3,4,6,7,8-HxCDF)	TX	9480	10187209
2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF	TX	9549	10187209
2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	TX	9612	10187209
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	TX	9618	10187209
Total Heptachlorodibenzofuran (Total HpCDF)	TX	9444	10187209
Total Heptachlorodibenzo-p-dioxin (Total HpCDD)	TX	9438	10187209
Total Hexachlorodibenzofuran (Total HxCDF)	TX	9483	10187209
Total Hexachlorodibenzo-p-dioxin (Total HxCDD)	TX	9468	10187209
Total Pentachlorodibenzofuran (Total PeCDF)	TX	9552	10187209
Total Pentachlorodibenzo-p-dioxin (Total PeCDD)	TX	9555	10187209
Total Tetrachlorodibenzofuran (Total TCDF)	TX	9615	10187209
Total Tetrachlorodibenzo-p-dioxin (Total TCDD)	TX	9609	10187209

Method EPA 8316

Analyte	**AB**	**Analyte ID**	**Method ID**
Acrylamide	TX	4330	10188202

Method EPA 8330

Analyte	**AB**	**Analyte ID**	**Method ID**
1,3,5-Trinitrobenzene (1,3,5-TNB)	TX	6885	10189807
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10189807
2,4,6-Trinitrotoluene (2,4,6-TNT)	TX	9651	10189807
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10189807
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10189807
2-Amino-4,6-dinitrotoluene (2-am-dnt)	TX	9303	10189807
2-Nitrotoluene	TX	9507	10189807
3-Nitrotoluene	TX	9510	10189807
4-Amino-2,6-dinitrotoluene (4-am-dnt)	TX	9306	10189807
4-Nitrotoluene	TX	9513	10189807

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Matrix: ***Non-Potable Water***

Methyl-2,4,6-trinitrophenylnitramine (tetryl)	TX	6415	10189807
Nitrobenzene	TX	5015	10189807
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	TX	9522	10189807
RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine)	TX	9432	10189807

Method EPA 9014

Analyte	**AB**	**Analyte ID**	**Method ID**
Amenable cyanide	TX	1510	10193803
Total cyanide	TX	1645	10193803

Method EPA 9038

Analyte	**AB**	**Analyte ID**	**Method ID**
Sulfate	TX	2000	10196608

Method EPA 9040

Analyte	**AB**	**Analyte ID**	**Method ID**
pH	TX	1900	10196802

Method EPA 9050

Analyte	**AB**	**Analyte ID**	**Method ID**
Conductivity	TX	1610	10198604

Method EPA 9056

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	TX	1540	10199209
Chloride	TX	1575	10199209
Fluoride	TX	1730	10199209
Nitrate as N	TX	1810	10199209
Nitrate-nitrite	TX	1820	10199209
Nitrite as N	TX	1840	10199209
Orthophosphate as P	TX	1870	10199209
Sulfate	TX	2000	10199209

Method EPA 9060

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Organic Carbon (TOC)	TX	2040	10200201

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Matrix: ***Non-Potable Water***

Method EPA 9065

Analyte	AB	Analyte ID	Method ID
Total phenolics	TX	1905	10200405

Method EPA 9066

Analyte	AB	Analyte ID	Method ID
Total phenolics	TX	1905	10200609

Method EPA 9250

Analyte	AB	Analyte ID	Method ID
Chloride	TX	1575	10207202

Method EPA RSK 175

Analyte	AB	Analyte ID	Method ID
2-methylpropane (Isobutane)	TX	4942	10212905
Ethane	TX	4747	10212905
Ethene	TX	4752	10212905
Methane	TX	4926	10212905
n-Butane	TX	5007	10212905
n-Propane	TX	5029	10212905

Method HACH 8000

Analyte	AB	Analyte ID	Method ID
Chemical oxygen demand (COD)	TX	1565	60003001

Method SM 2120 B

Analyte	AB	Analyte ID	Method ID
Color	TX	1605	20223807

Method SM 2310 B (4a)

Analyte	AB	Analyte ID	Method ID
Acidity, as CaCO3	TX	1500	20002806

Method SM 2320 B

Analyte	AB	Analyte ID	Method ID
Alkalinity as CaCO3	TX	1505	20045005

Method SM 2340 B

Analyte	AB	Analyte ID	Method ID

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Matrix: ***Non-Potable Water***

Total hardness as CaCO3	TX	1755	20046008

Method SM 2510 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Conductivity	TX	1610	20048004

Method SM 2540 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-total (total solids)	TX	1950	20004608

Method SM 2540 C

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-filterable (TDS)	TX	1955	20049803

Method SM 2540 D

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-nonfilterable (TSS)	TX	1960	20004802

Method SM 3500-Cr B

Analyte	**AB**	**Analyte ID**	**Method ID**
Chromium (VI)	TX	1045	20065809

Method SM 4500-Cl F

Analyte	**AB**	**Analyte ID**	**Method ID**
Total residual chlorine	TX	1940	20080482

Method SM 4500-Cl^- E

Analyte	**AB**	**Analyte ID**	**Method ID**
Chloride	TX	1575	20019209

Method SM 4500-CN^- C

Analyte	**AB**	**Analyte ID**	**Method ID**
Total cyanide	TX	1645	20020808

Method SM 4500-CN^- E

Analyte	**AB**	**Analyte ID**	**Method ID**
Total cyanide	TX	1645	20021209

Method SM 4500-CN^- G

Analyte	**AB**	**Analyte ID**	**Method ID**
Amenable cyanide	TX	1510	20021607

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Matrix: ***Non-Potable Water***

Method SM 4500-H+ B

Analyte	AB	Analyte ID	Method ID
pH	TX	1900	20104603

Method SM 4500-NH3 D

Analyte	AB	Analyte ID	Method ID
Ammonia as N	TX	1515	20108809
Kjeldahl Nitrogen (Total Kjeldahl Nitrogen-TKN)	TX	1790	20108809

Method SM 4500-NH3 F

Analyte	AB	Analyte ID	Method ID
Ammonia as N	TX	1515	20023001

Method SM 4500-O G

Analyte	AB	Analyte ID	Method ID
Oxygen, dissolved	TX	1880	20025405

Method SM 4500-P E

Analyte	AB	Analyte ID	Method ID
Orthophosphate as P	TX	1870	20025803
Phosphorus	TX	1910	20025803

Method SM 4500-$S2^{-}$ F

Analyte	AB	Analyte ID	Method ID
Sulfide	TX	2005	20126209

Method SM 4500-SiO2 D

Analyte	AB	Analyte ID	Method ID
Silica as SiO2	TX	1990	20127202

Method SM 4500-$SO3^{-}$ B

Analyte	AB	Analyte ID	Method ID
Sulfite	TX	2015	20026806

Method SM 5210 B

Analyte	AB	Analyte ID	Method ID
Biochemical oxygen demand (BOD)	TX	1530	20027401
Carbonaceous BOD, CBOD	TX	1555	20027401

Method SM 5310 B

Analyte	AB	Analyte ID	Method ID

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Matrix: ***Non-Potable Water***

Total Organic Carbon (TOC)	TX	2040	20137206

Method SM 5310 C

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Organic Carbon (TOC)	TX	2040	20138209

Method SM 5540 C

Analyte	**AB**	**Analyte ID**	**Method ID**
Surfactants - MBAS	TX	2025	20144405

Method TCEQ 1005

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Petroleum Hydrocarbons (TPH)	TX	2050	90019208

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Matrix: ***Solid & Chemical Materials***

Method ASTM D2216

Analyte	AB	Analyte ID	Method ID
Moisture	TX	10337	ASTM D2216-05

Method EPA 1010

Analyte	AB	Analyte ID	Method ID
Ignitability	TX	1780	10116606

Method EPA 1030

Analyte	AB	Analyte ID	Method ID
Ignitability	TX	1780	10117201

Method EPA 1311

Analyte	AB	Analyte ID	Method ID
TCLP	TX	849	10118806

Method EPA 1312

Analyte	AB	Analyte ID	Method ID
SPLP	TX	850	10119003

Method EPA 1668

Analyte	AB	Analyte ID	Method ID
Decachlorobiphenyls	TX	10332	10262007
Dichlorobiphenyls	TX	464	10262007
Heptachlorobiphenyls	TX	486	10262007
Hexachlorobiphenyls	TX	487	10262007
Monochlorobiphenyls	TX	501	10262007
Nonachlorobiphenyls	TX	507	10262007
Octachlorobiphenyls	TX	508	10262007
Pentachlorobiphenyls	TX	515	10262007
Tetrachlorobiphenyls	TX	528	10262007
Trichlorobiphenyls	TX	541	10262007

Method EPA 200.8

Analyte	AB	Analyte ID	Method ID
Uranium	TX	3035	10014605

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Matrix: ***Solid & Chemical Materials***

Method EPA 300.0

Analyte	AB	Analyte ID	Method ID
Bromide	TX	1540	10053200
Chloride	TX	1575	10053200
Fluoride	TX	1730	10053200
Nitrate as N	TX	1810	10053200
Nitrate-nitrite	TX	1820	10053200
Nitrite as N	TX	1840	10053200
Orthophosphate as P	TX	1870	10053200
Sulfate	TX	2000	10053200

Method EPA 310.1

Analyte	AB	Analyte ID	Method ID
Alkalinity as CaCO3	TX	1505	10054805

Method EPA 350.3

Analyte	AB	Analyte ID	Method ID
Ammonia as N	TX	1515	10064401

Method EPA 365.3

Analyte	AB	Analyte ID	Method ID
Orthophosphate as P	TX	1870	10070801
Phosphorus	TX	1910	10070801

Method EPA 6020

Analyte	AB	Analyte ID	Method ID
Aluminum	TX	1000	10156204
Antimony	TX	1005	10156204
Arsenic	TX	1010	10156204
Barium	TX	1015	10156204
Beryllium	TX	1020	10156204
Boron	TX	1025	10156204
Cadmium	TX	1030	10156204
Calcium	TX	1035	10156204
Chromium	TX	1040	10156204

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Matrix: ***Solid & Chemical Materials***

Cobalt	TX	1050	10156204
Copper	TX	1055	10156204
Iron	TX	1070	10156204
Lead	TX	1075	10156204
Lithium	TX	1080	10156204
Magnesium	TX	1085	10156204
Manganese	TX	1090	10156204
Molybdenum	TX	1100	10156204
Nickel	TX	1105	10156204
Potassium	TX	1125	10156204
Selenium	TX	1140	10156204
Silver	TX	1150	10156204
Sodium	TX	1155	10156204
Strontium	TX	1160	10156204
Thallium	TX	1165	10156204
Tin	TX	1175	10156204
Titanium	TX	1180	10156204
Vanadium	TX	1185	10156204
Zinc	TX	1190	10156204

Method EPA 7196

Analyte	**AB**	**Analyte ID**	**Method ID**
Chromium (VI)	TX	1045	10162206

Method EPA 7470

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10165603

Method EPA 7471

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10166004

Method EPA 8015

Analyte	**AB**	**Analyte ID**	**Method ID**
Diesel range organics (DRO)	TX	9369	10173203

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Matrix: ***Solid & Chemical Materials***

Ethanol	TX	4750	10173203
Ethylene glycol	TX	4785	10173203
Gasoline range organics (GRO)	TX	9408	10173203
Isobutyl alcohol (2-Methyl-1-propanol)	TX	4875	10173203
Isopropyl alcohol (2-Propanol, Isopropanol)	TX	4895	10173203
Methanol	TX	4930	10173203
n-Butyl alcohol (1-Butanol, n-Butanol)	TX	4425	10173203
n-Propanol (1-Propanol)	TX	5055	10173203
Propylene Glycol	TX	6657	10173203
tert-Butyl alcohol	TX	4420	10173203

Method EPA 8021

Analyte	**AB**	**Analyte ID**	**Method ID**
Benzene	TX	4375	10174400
Ethylbenzene	TX	4765	10174400
m+p-xylene	TX	5240	10174400
Methyl tert-butyl ether (MTBE)	TX	5000	10174400
o-Xylene	TX	5250	10174400
Toluene	TX	5140	10174400
Xylene (total)	TX	5260	10174400

Method EPA 8081

Analyte	**AB**	**Analyte ID**	**Method ID**
4,4'-DDD	TX	7355	10178402
4,4'-DDE	TX	7360	10178402
4,4'-DDT	TX	7365	10178402
Aldrin	TX	7025	10178402
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10178402
alpha-Chlordane	TX	7240	10178402
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10178402
Chlordane (tech.)	TX	7250	10178402
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10178402
Dieldrin	TX	7470	10178402

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Matrix: ***Solid & Chemical Materials***

Endosulfan I	TX	7510	10178402
Endosulfan II	TX	7515	10178402
Endosulfan sulfate	TX	7520	10178402
Endrin	TX	7540	10178402
Endrin aldehyde	TX	7530	10178402
Endrin ketone	TX	7535	10178402
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10178402
gamma-Chlordane	TX	7245	10178402
Heptachlor	TX	7685	10178402
Heptachlor epoxide	TX	7690	10178402
Methoxychlor	TX	7810	10178402
Mirex	TX	7870	10178402
Toxaphene (Chlorinated camphene)	TX	8250	10178402

Method EPA 8082

Analyte	**AB**	**Analyte ID**	**Method ID**
Aroclor-1016 (PCB-1016)	TX	8880	10179201
Aroclor-1221 (PCB-1221)	TX	8885	10179201
Aroclor-1232 (PCB-1232)	TX	8890	10179201
Aroclor-1242 (PCB-1242)	TX	8895	10179201
Aroclor-1248 (PCB-1248)	TX	8900	10179201
Aroclor-1254 (PCB-1254)	TX	8905	10179201
Aroclor-1260 (PCB-1260)	TX	8910	10179201
PCBs (total)	TX	8870	10179201

Method EPA 8260

Analyte	**AB**	**Analyte ID**	**Method ID**
1,1,1,2-Tetrachloroethane	TX	5105	10184404
1,1,1-Trichloroethane	TX	5160	10184404
1,1,2,2-Tetrachloroethane	TX	5110	10184404
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	TX	5195	10184404
1,1,2-Trichloroethane	TX	5165	10184404
1,1-Dichloroethane	TX	4630	10184404

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Matrix: ***Solid & Chemical Materials***

1,1-Dichloroethylene	TX	4640	10184404
1,1-Dichloropropene	TX	4670	10184404
1,2,3-Trichlorobenzene	TX	5150	10184404
1,2,3-Trichloropropane	TX	5180	10184404
1,2,4-Trichlorobenzene	TX	5155	10184404
1,2,4-Trimethylbenzene	TX	5210	10184404
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10184404
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10184404
1,2-Dichlorobenzene	TX	4610	10184404
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10184404
1,2-Dichloropropane	TX	4655	10184404
1,3,5-Trimethylbenzene	TX	5215	10184404
1,3-Dichlorobenzene	TX	4615	10184404
1,3-Dichloropropane	TX	4660	10184404
1,4-Dichlorobenzene	TX	4620	10184404
1,4-Dioxane (1,4-Diethyleneoxide)	TX	4735	10184404
1-Chlorohexane	TX	4510	10184404
1-Propanol	TX	5060	10184404
2,2-Dichloropropane	TX	4665	10184404
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10184404
2-Chloroethyl vinyl ether	TX	4500	10184404
2-Chlorotoluene	TX	4535	10184404
2-Hexanone (MBK)	TX	4860	10184404
4-Chlorotoluene	TX	4540	10184404
4-Isopropyltoluene (p-Cymene)	TX	4915	10184404
4-Methyl-2-pentanone (MIBK)	TX	4995	10184404
Acetone (2-Propanone)	TX	4315	10184404
Acetonitrile	TX	4320	10184404
Acrolein (Propenal)	TX	4325	10184404
Acrylonitrile	TX	4340	10184404

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Matrix: ***Solid & Chemical Materials***

Allyl chloride (3-Chloropropene)	TX	4355	10184404
Benzene	TX	4375	10184404
Benzyl chloride	TX	5635	10184404
Bromobenzene	TX	4385	10184404
Bromochloromethane	TX	4390	10184404
Bromodichloromethane	TX	4395	10184404
Bromoform	TX	4400	10184404
Carbon disulfide	TX	4450	10184404
Carbon tetrachloride	TX	4455	10184404
Chlorobenzene	TX	4475	10184404
Chlorodibromomethane	TX	4575	10184404
Chloroethane (Ethyl chloride)	TX	4485	10184404
Chloroform	TX	4505	10184404
Chloroprene (2-Chloro-1,3-butadiene)	TX	4525	10184404
cis-1,2-Dichloroethylene	TX	4645	10184404
cis-1,3-Dichloropropene	TX	4680	10184404
Dibromofluoromethane	TX	4590	10184404
Dibromomethane (Methylene bromide)	TX	4595	10184404
Dichlorodifluoromethane (Freon-12)	TX	4625	10184404
Diethyl ether	TX	4725	10184404
Epichlorohydrin (1-Chloro-2,3-epoxypropane)	TX	4745	10184404
Ethanol	TX	4750	10184404
Ethyl acetate	TX	4755	10184404
Ethyl methacrylate	TX	4810	10184404
Ethylbenzene	TX	4765	10184404
Ethylene oxide	TX	4795	10184404
Hexachlorobutadiene	TX	4835	10184404
Iodomethane (Methyl iodide)	TX	4870	10184404
Isobutyl alcohol (2-Methyl-1-propanol)	TX	4875	10184404
Isopropyl alcohol (2-Propanol, Isopropanol)	TX	4895	10184404

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Matrix: ***Solid & Chemical Materials***

Isopropylbenzene (Cumene)	TX	4900	10184404
m+p-xylene	TX	5240	10184404
Methacrylonitrile	TX	4925	10184404
Methyl acetate	TX	4940	10184404
Methyl acrylate	TX	4945	10184404
Methyl bromide (Bromomethane)	TX	4950	10184404
Methyl chloride (Chloromethane)	TX	4960	10184404
Methyl methacrylate	TX	4990	10184404
Methyl tert-butyl ether (MTBE)	TX	5000	10184404
Methylcyclohexane	TX	4965	10184404
Methylene chloride (Dichloromethane)	TX	4975	10184404
Naphthalene	TX	5005	10184404
n-Butyl alcohol (1-Butanol, n-Butanol)	TX	4425	10184404
n-Butylbenzene	TX	4435	10184404
n-Propylbenzene	TX	5090	10184404
o-Xylene	TX	5250	10184404
Pentachloroethane	TX	5035	10184404
Propionitrile (Ethyl cyanide)	TX	5080	10184404
Pyridine	TX	5095	10184404
sec-Butylbenzene	TX	4440	10184404
Styrene	TX	5100	10184404
tert-Butyl alcohol	TX	4420	10184404
tert-Butylbenzene	TX	4445	10184404
Tetrachloroethylene (Perchloroethylene)	TX	5115	10184404
Toluene	TX	5140	10184404
trans-1,2-Dichloroethylene	TX	4700	10184404
trans-1,3-Dichloropropylene	TX	4685	10184404
trans-1,4-Dichloro-2-butene	TX	4605	10184404
Trichloroethene (Trichloroethylene)	TX	5170	10184404
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10184404

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Matrix: ***Solid & Chemical Materials***

Vinyl acetate	TX	5225	10184404
Vinyl chloride	TX	5235	10184404
Xylene (total)	TX	5260	10184404

Method EPA 8270

Analyte	AB	Analyte ID	Method ID
1,2,4,5-Tetrachlorobenzene	TX	6715	10185203
1,2,4-Trichlorobenzene	TX	5155	10185203
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10185203
1,2-Dichlorobenzene	TX	4610	10185203
1,2-Dinitrobenzene	TX	6155	10185203
1,2-Diphenylhydrazine	TX	6220	10185203
1,3,5-Trinitrobenzene (1,3,5-TNB)	TX	6885	10185203
1,3-Dichlorobenzene	TX	4615	10185203
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10185203
1,4-Dichlorobenzene	TX	4620	10185203
1,4-Dinitrobenzene	TX	6165	10185203
1,4-Naphthoquinone	TX	6420	10185203
1,4-Phenylenediamine	TX	6630	10185203
1-Chloronaphthalene	TX	5790	10185203
1-Naphthylamine	TX	6425	10185203
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10185203
2,3,4,6-Tetrachlorophenol	TX	6735	10185203
2,4,5-Trichlorophenol	TX	6835	10185203
2,4,5-Trimethylaniline	TX	6880	10185203
2,4,6-Trichlorophenol	TX	6840	10185203
2,4-Diaminotoluene	TX	5880	10185203
2,4-Dichlorophenol	TX	6000	10185203
2,4-Dimethylphenol	TX	6130	10185203
2,4-Dinitrophenol	TX	6175	10185203
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10185203

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Matrix: ***Solid & Chemical Materials***

2,6-Dichlorophenol	TX	6005	10185203
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10185203
2-Acetylaminofluorene	TX	5515	10185203
2-Chloronaphthalene	TX	5795	10185203
2-Chlorophenol	TX	5800	10185203
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10185203
2-Methylaniline (o-Toluidine)	TX	5145	10185203
2-Methylnaphthalene	TX	6385	10185203
2-Methylphenol (o-Cresol)	TX	6400	10185203
2-Naphthylamine	TX	6430	10185203
2-Nitroaniline	TX	6460	10185203
2-Nitrophenol	TX	6490	10185203
2-Picoline (2-Methylpyridine)	TX	5050	10185203
3,3'-Dichlorobenzidine	TX	5945	10185203
3,3'-Dimethylbenzidine	TX	6120	10185203
3-Methylcholanthrene	TX	6355	10185203
3-Methylphenol (m-Cresol)	TX	6405	10185203
3-Nitroaniline	TX	6465	10185203
4-Aminobiphenyl	TX	5540	10185203
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10185203
4-Chloro-3-methylphenol	TX	5700	10185203
4-Chloroaniline	TX	5745	10185203
4-Chlorophenyl phenylether	TX	5825	10185203
4-Methylphenol (p-Cresol)	TX	6410	10185203
4-Nitroaniline	TX	6470	10185203
4-Nitrophenol	TX	6500	10185203
4-Nitroquinoline-1-oxide	TX	6510	10185203
5-Nitro-o-toluidine	TX	6570	10185203
7,12-Dimethylbenz(a) anthracene	TX	6115	10185203
a-a-Dimethylphenethylamine	TX	6125	10185203

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Matrix: ***Solid & Chemical Materials***

Acenaphthene	TX	5500	10185203
Acenaphthylene	TX	5505	10185203
Acetophenone	TX	5510	10185203
Aniline	TX	5545	10185203
Anthracene	TX	5555	10185203
Aramite	TX	5560	10185203
Atrazine	TX	7065	10185203
Azinphos-methyl (Guthion)	TX	7075	10185203
Azobenzene	TX	5562	10185203
Benzenethiol (Thiophenol)	TX	6750	10185203
Benzidine	TX	5595	10185203
Benzo(a)anthracene	TX	5575	10185203
Benzo(a)pyrene	TX	5580	10185203
Benzo(b)fluoranthene	TX	5585	10185203
Benzo(e)pyrene	TX	5605	10185203
Benzo(g,h,i)perylene	TX	5590	10185203
Benzo(k)fluoranthene	TX	5600	10185203
Benzoic acid	TX	5610	10185203
Benzyl alcohol	TX	5630	10185203
Biphenyl	TX	5640	10185203
bis(2-Chloroethoxy)methane	TX	5760	10185203
bis(2-Chloroethyl) ether	TX	5765	10185203
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10185203
Butyl benzyl phthalate	TX	5670	10185203
Caprolactam	TX	7180	10185203
Carbaryl (Sevin)	TX	7195	10185203
Carbazole	TX	5680	10185203
Carbophenothion	TX	7220	10185203
Chlorobenzilate	TX	7260	10185203
Chrysene	TX	5855	10185203

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Matrix: ***Solid & Chemical Materials***

Demeton	TX	7390	10185203
Demeton-o	TX	7395	10185203
Demeton-s	TX	7385	10185203
Diallate	TX	7405	10185203
Dibenz(a,h) anthracene	TX	5895	10185203
Dibenz(a,j) acridine	TX	5900	10185203
Dibenzo(a,e) pyrene	TX	5890	10185203
Dibenzofuran	TX	5905	10185203
Dichlorovos (DDVP, Dichlorvos)	TX	8610	10185203
Diethyl phthalate	TX	6070	10185203
Dimethoate	TX	7475	10185203
Dimethyl phthalate	TX	6135	10185203
Di-n-butyl phthalate	TX	5925	10185203
Di-n-octyl phthalate	TX	6200	10185203
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	TX	8620	10185203
Diphenylamine	TX	6205	10185203
Disulfoton	TX	8625	10185203
Ethyl methanesulfonate	TX	6260	10185203
Fluoranthene	TX	6265	10185203
Fluorene	TX	6270	10185203
Hexachlorobenzene	TX	6275	10185203
Hexachlorobutadiene	TX	4835	10185203
Hexachlorocyclopentadiene	TX	6285	10185203
Hexachloroethane	TX	4840	10185203
Hexachlorophene	TX	6290	10185203
Hexachloropropene	TX	6295	10185203
Indeno(1,2,3-cd) pyrene	TX	6315	10185203
Isodrin	TX	7725	10185203
Isophorone	TX	6320	10185203
Isosafrole	TX	6325	10185203

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Matrix: ***Solid & Chemical Materials***

Kepone	TX	7740	10185203
Malathion	TX	7770	10185203
Methapyrilene	TX	6345	10185203
Methyl methanesulfonate	TX	6375	10185203
Methyl parathion (Parathion, methyl)	TX	7825	10185203
Mevinphos	TX	7850	10185203
Naphthalene	TX	5005	10185203
Nitrobenzene	TX	5015	10185203
n-Nitrosodiethylamine	TX	6525	10185203
n-Nitrosodimethylamine	TX	6530	10185203
n-Nitrosodi-n-butylamine	TX	5025	10185203
n-Nitrosodi-n-propylamine	TX	6545	10185203
n-Nitrosodiphenylamine	TX	6535	10185203
n-Nitrosomethylethylamine	TX	6550	10185203
n-Nitrosomorpholine	TX	6555	10185203
n-Nitrosopiperidine	TX	6560	10185203
n-Nitrosopyrrolidine	TX	6565	10185203
o,o,o-Triethyl phosphorothioate	TX	8290	10185203
o-Anisidine	TX	5550	10185203
Parathion, ethyl	TX	7955	10185203
p-Cresidine	TX	5860	10185203
Pentachlorobenzene	TX	6590	10185203
Pentachloronitrobenzene (PCNB)	TX	6600	10185203
Pentachlorophenol	TX	6605	10185203
Phenacetin	TX	6610	10185203
Phenanthrene	TX	6615	10185203
Phenol	TX	6625	10185203
Phorate	TX	7985	10185203
Pronamide (Kerb)	TX	6650	10185203
Pyrene	TX	6665	10185203

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate: T104704231-19-23

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

Expiration Date: 4/30/2020

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

Issue Date: 5/1/2019

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: ***Solid & Chemical Materials***

Pyridine	TX	5095	10185203
Quinoline	TX	6670	10185203
Safrole	TX	6685	10185203
Sulfotepp	TX	8155	10185203
Terbufos	TX	8185	10185203
Tetrachlorvinphos (Stirophos, Gardona)	TX	8197	10185203
Thionazin (Zinophos)	TX	8235	10185203
Toluene diisocyanate	TX	6775	10185203

Method EPA 8290

Analyte	AB	Analyte ID	Method ID
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	TX	9516	10187209
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	TX	9519	10187209
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	TX	9420	10187209
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	TX	9426	10187209
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	TX	9423	10187209
1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-HxCDF)	TX	9471	10187209
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-HxCDD)	TX	9453	10187209
1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-HxCDF)	TX	9474	10187209
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin(1,2,3,6,7,8-HxCDD)	TX	9456	10187209
1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-HxCDF)	TX	9477	10187209
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-HxCDD)	TX	9459	10187209
1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-PeCDF)	TX	9543	10187209
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD)	TX	9540	10187209
2,3,4,6,7,8-Hexachlorodibenzofuran (2,3,4,6,7,8-HxCDF)	TX	9480	10187209
2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF	TX	9549	10187209
2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	TX	9612	10187209
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	TX	9618	10187209
Total Heptachlorodibenzofuran (Total HpCDF)	TX	9444	10187209
Total Heptachlorodibenzo-p-dioxin (Total HpCDD)	TX	9438	10187209
Total Hexachlorodibenzofuran (Total HxCDF)	TX	9483	10187209

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Matrix: ***Solid & Chemical Materials***

Total Hexachlorodibenzo-p-dioxin (Total HxCDD)	TX	9468	10187209
Total Pentachlorodibenzofuran (Total PeCDF)	TX	9552	10187209
Total Pentachlorodibenzo-p-dioxin (Total PeCDD)	TX	9555	10187209
Total Tetrachlorodibenzofuran (Total TCDF)	TX	9615	10187209
Total Tetrachlorodibenzo-p-dioxin (Total TCDD)	TX	9609	10187209

Method EPA 8316

Analyte	**AB**	**Analyte ID**	**Method ID**
Acrylamide	TX	4330	10188202

Method EPA 8330

Analyte	**AB**	**Analyte ID**	**Method ID**
1,3,5-Trinitrobenzene (1,3,5-TNB)	TX	6885	10189807
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10189807
2,4,6-Trinitrotoluene (2,4,6-TNT)	TX	9651	10189807
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10189807
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10189807
2-Amino-4,6-dinitrotoluene (2-am-dnt)	TX	9303	10189807
2-Nitrotoluene	TX	9507	10189807
3-Nitrotoluene	TX	9510	10189807
4-Amino-2,6-dinitrotoluene (4-am-dnt)	TX	9306	10189807
4-Nitrotoluene	TX	9513	10189807
Methyl-2,4,6-trinitrophenylnitramine (tetryl)	TX	6415	10189807
Nitrobenzene	TX	5015	10189807
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	TX	9522	10189807
RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine)	TX	9432	10189807

Method EPA 9014

Analyte	**AB**	**Analyte ID**	**Method ID**
Amenable cyanide	TX	1510	10193803
Total cyanide	TX	1645	10193803

Method EPA 9038

Analyte	**AB**	**Analyte ID**	**Method ID**
Sulfate	TX	2000	10196608

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Matrix: ***Solid & Chemical Materials***

Method EPA 9040

Analyte	AB	Analyte ID	Method ID
Corrosivity	TX	1615	10197203
pH	TX	1900	10196802

Method EPA 9045

Analyte	AB	Analyte ID	Method ID
Corrosivity	TX	1615	10197805
pH	TX	1900	10197805

Method EPA 9050

Analyte	AB	Analyte ID	Method ID
Conductivity	TX	1610	10198604

Method EPA 9056

Analyte	AB	Analyte ID	Method ID
Bromide	TX	1540	10199209
Chloride	TX	1575	10199209
Fluoride	TX	1730	10199209
Nitrate as N	TX	1810	10199209
Nitrate-nitrite	TX	1820	10199209
Nitrite as N	TX	1840	10199209
Orthophosphate as P	TX	1870	10199209
Sulfate	TX	2000	10199209

Method EPA 9060

Analyte	AB	Analyte ID	Method ID
Total Organic Carbon (TOC)	TX	2040	10200201

Method EPA 9065

Analyte	AB	Analyte ID	Method ID
Total phenolics	TX	1905	10200405

Method EPA 9071

Analyte	AB	Analyte ID	Method ID
n-Hexane Extractable Material (HEM) (O&G)	TX	1803	10201204

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Issue Date: 5/1/2019

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Matrix: ***Solid & Chemical Materials***

Method	Analyte	AB	Analyte ID	Method ID
EPA 9095	Paint Filter Liquids Test	TX	10312	10204009
EPA 9250	Chloride	TX	1575	10207202
SM 2320 B	Alkalinity as CaCO3	TX	1505	20045005
SM 2510 B	Conductivity	TX	1610	20048004
SM 2540 G	Residue-total (total solids)	TX	1950	20005203
SSA/ASA Part 3:34	Carbon, organic (Walkley-Black)	TX	10340	SSA/ASA Pt 3:34
TCEQ 1005	Total Petroleum Hydrocarbons (TPH)	TX	2050	90019208

10450 Stancliff Rd. Suite 210
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T: +1 281 530 5656
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February 10, 2020

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

Work Order: **HS20011451**

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

Dear Eric,

ALS Environmental received 5 sample(s) on Jan 30, 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	
WorkOrder:	**HS20011451**	

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.
Project:	Houston TX-Wood Preserving Works
WorkOrder:	**HS20011451**

TRRP Laboratory Data Package Cover Page

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: 02/10/2020				
Project Name: Houston TX-Wood Preserving Works			Laboratory Job Number: HS20011451				
Reviewer Name: Bernadette Fini			Prep Batch Number(s): 150183,R355572,R355975				
#[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				
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			1
		Were MS/MSD RPDs within laboratory QC limits?		X			2
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: 02/10/2020				
Project Name: Houston TX-Wood Preserving Works			Laboratory Job Number: HS20011451				
Reviewer Name: Bernadette Fini			Prep Batch Number(s): 150183,R355572,R355975				
#[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: 02/10/2020
Project Name: Houston TX-Wood Preserving Works	Laboratory Job Number: HS20011451
Reviewer Name: Bernadette Fini	Prep Batch Number(s): 150183,R355572,R355975

ER#[5]	Description
1	Batch 150183, Semivolatile Organics Method SW8270, sample HS20011422-01, MSD was performed on unrelated sample. Batch zzr355572, Volatile Organics Method SW8260, sample HS20011456-02, MS and MSD were performed on unrelated sample.
2	Batch 150183, Semivolatile Organics Method SW8270, sample HS20011422-01, MS/MSD RPD is for an unrelated sample.

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;
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Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Work Order: HS20011451

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20011451-01	SO-1620-SG22 (0.5-1) 20200129	Soil		29-Jan-2020 09:45	30-Jan-2020 16:40	☐
HS20011451-02	SO-1620-SG22 (5.5-6) 20200129	Soil		29-Jan-2020 10:30	30-Jan-2020 16:40	☐
HS20011451-03	SO-1620-SG21 (0.5-1) 20200129	Soil		29-Jan-2020 11:30	30-Jan-2020 16:40	☐
HS20011451-04	SO-1620-SG21 (5.5-6) 20200129	Soil		29-Jan-2020 14:15	30-Jan-2020 16:40	☐
HS20011451-05	SO-1620-SG20 (0.5-1) 20200129	Soil		29-Jan-2020 15:00	30-Jan-2020 16:40	☑

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG22 (0.5-1) 20200129
Collection Date: 29-Jan-2020 09:45

ANALYTICAL REPORT
WorkOrder:HS20011451
Lab ID:HS20011451-01
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00061	0.0061	mg/Kg-dry	1	04-Feb-2020 03:37
Ethylbenzene		U	0.00085	0.0061	mg/Kg-dry	1	04-Feb-2020 03:37
Xylenes, Total		U	0.0012	0.0061	mg/Kg-dry	1	04-Feb-2020 03:37
Surr: 1,2-Dichloroethane-d4	*114*			*70-126*	*%REC*	*1*	*04-Feb-2020 03:37*
Surr: 4-Bromofluorobenzene	*105*			*70-130*	*%REC*	*1*	*04-Feb-2020 03:37*
Surr: Dibromofluoromethane	*109*			*70-130*	*%REC*	*1*	*04-Feb-2020 03:37*
Surr: Toluene-d8	*104*			*70-130*	*%REC*	*1*	*04-Feb-2020 03:37*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 31-Jan-2020		Analyst: GEY
Naphthalene	**0.14**		**0.00072**	**0.0039**	**mg/Kg-dry**	1	03-Feb-2020 19:59
Surr: 2-Fluorobiphenyl	*89.1*			*43-125*	*%REC*	*1*	*03-Feb-2020 19:59*
Surr: 4-Terphenyl-d14	*98.1*			*32-125*	*%REC*	*1*	*03-Feb-2020 19:59*
Surr: Nitrobenzene-d5	*72.7*			*37-125*	*%REC*	*1*	*03-Feb-2020 19:59*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: MZD
Percent Moisture	**16.9**		**0.0100**	**0.0100**	**wt%**	1	10-Feb-2020 08:28

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG22 (5.5-6) 20200129
Collection Date: 29-Jan-2020 10:30

ANALYTICAL REPORT
WorkOrder:HS20011451
Lab ID:HS20011451-02
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00056	0.0056	mg/Kg-dry	1	04-Feb-2020 03:59
Ethylbenzene		U	0.00079	0.0056	mg/Kg-dry	1	04-Feb-2020 03:59
Xylenes, Total		U	0.0011	0.0056	mg/Kg-dry	1	04-Feb-2020 03:59
Surr: 1,2-Dichloroethane-d4	*112*			*70-126*	*%REC*	*1*	*04-Feb-2020 03:59*
Surr: 4-Bromofluorobenzene	*104*			*70-130*	*%REC*	*1*	*04-Feb-2020 03:59*
Surr: Dibromofluoromethane	*106*			*70-130*	*%REC*	*1*	*04-Feb-2020 03:59*
Surr: Toluene-d8	*102*			*70-130*	*%REC*	*1*	*04-Feb-2020 03:59*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 31-Jan-2020		Analyst: GEY
Naphthalene		U	0.00072	0.0039	mg/Kg-dry	1	31-Jan-2020 20:29
Surr: 2-Fluorobiphenyl	*86.4*			*43-125*	*%REC*	*1*	*31-Jan-2020 20:29*
Surr: 4-Terphenyl-d14	*95.7*			*32-125*	*%REC*	*1*	*31-Jan-2020 20:29*
Surr: Nitrobenzene-d5	*72.0*			*37-125*	*%REC*	*1*	*31-Jan-2020 20:29*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: MZD
Percent Moisture	**16.4**		**0.0100**	**0.0100**	**wt%**	1	10-Feb-2020 08:28

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG21 (0.5-1) 20200129
Collection Date: 29-Jan-2020 11:30

ANALYTICAL REPORT
WorkOrder:HS20011451
Lab ID:HS20011451-03
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00088	0.0088	mg/Kg-dry	1	04-Feb-2020 04:22
Ethylbenzene		U	0.0012	0.0088	mg/Kg-dry	1	04-Feb-2020 04:22
Xylenes, Total		U	0.0018	0.0088	mg/Kg-dry	1	04-Feb-2020 04:22
Surr: 1,2-Dichloroethane-d4	*109*			*70-126*	*%REC*	*1*	*04-Feb-2020 04:22*
Surr: 4-Bromofluorobenzene	*104*			*70-130*	*%REC*	*1*	*04-Feb-2020 04:22*
Surr: Dibromofluoromethane	*105*			*70-130*	*%REC*	*1*	*04-Feb-2020 04:22*
Surr: Toluene-d8	*103*			*70-130*	*%REC*	*1*	*04-Feb-2020 04:22*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 31-Jan-2020		Analyst: GEY
Naphthalene	**0.022**		**0.00068**	**0.0038**	**mg/Kg-dry**	1	03-Feb-2020 20:18
Surr: 2-Fluorobiphenyl	*83.7*			*43-125*	*%REC*	*1*	*03-Feb-2020 20:18*
Surr: 4-Terphenyl-d14	*97.1*			*32-125*	*%REC*	*1*	*03-Feb-2020 20:18*
Surr: Nitrobenzene-d5	*72.5*			*37-125*	*%REC*	*1*	*03-Feb-2020 20:18*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: MZD
Percent Moisture	**12.4**		**0.0100**	**0.0100**	**wt%**	1	10-Feb-2020 08:28

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG21 (5.5-6) 20200129
Collection Date: 29-Jan-2020 14:15

ANALYTICAL REPORT
WorkOrder:HS20011451
Lab ID:HS20011451-04
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00053	0.0053	mg/Kg-dry	1	04-Feb-2020 04:45
Ethylbenzene		U	0.00074	0.0053	mg/Kg-dry	1	04-Feb-2020 04:45
Xylenes, Total		U	0.0011	0.0053	mg/Kg-dry	1	04-Feb-2020 04:45
Surr: 1,2-Dichloroethane-d4	*106*			*70-126*	*%REC*	*1*	*04-Feb-2020 04:45*
Surr: 4-Bromofluorobenzene	*103*			*70-130*	*%REC*	*1*	*04-Feb-2020 04:45*
Surr: Dibromofluoromethane	*105*			*70-130*	*%REC*	*1*	*04-Feb-2020 04:45*
Surr: Toluene-d8	*104*			*70-130*	*%REC*	*1*	*04-Feb-2020 04:45*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 31-Jan-2020		Analyst: GEY
Naphthalene	**0.010**		**0.00071**	**0.0039**	**mg/Kg-dry**	1	31-Jan-2020 21:07
Surr: 2-Fluorobiphenyl	*93.4*			*43-125*	*%REC*	*1*	*31-Jan-2020 21:07*
Surr: 4-Terphenyl-d14	*101*			*32-125*	*%REC*	*1*	*31-Jan-2020 21:07*
Surr: Nitrobenzene-d5	*76.5*			*37-125*	*%REC*	*1*	*31-Jan-2020 21:07*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: MZD
Percent Moisture	**16.2**		**0.0100**	**0.0100**	**wt%**	1	10-Feb-2020 08:28

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
WorkOrder: HS20011451

Batch ID: 3589 **Start Date:** 31 Jan 2020 09:41 **End Date:** 31 Jan 2020 09:41
Method: VOLATILES BY SW8260C

Sample ID	Container	Sample Wt/Vol	Final Volume	Weight Factor	Container Type
HS20011451-01	1	4.941 (g)	5 (mL)	1.01	TerraCore (5035A)
HS20011451-02	1	5.297 (g)	5 (mL)	0.94	TerraCore (5035A)
HS20011451-03	1	3.243 (g)	5 (mL)	1.54	TerraCore (5035A)
HS20011451-04	1	5.707 (g)	5 (mL)	0.88	TerraCore (5035A)

Batch ID: 150183 **Start Date:** 31 Jan 2020 07:28 **End Date:** 31 Jan 2020 14:00
Method: SV SOXHLET EXTRACT-LOWLEVEL-SW3541 **Prep Code:** 3541_B_LOW

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20011451-01	1	30.19 (g)	1 (mL)	0.03312
HS20011451-02	1	30.11 (g)	1 (mL)	0.03321
HS20011451-03	1	30.04 (g)	1 (mL)	0.03329
HS20011451-04	1	30.21 (g)	1 (mL)	0.0331

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20011451

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 150183 (0)	**Test Name :** LOW-LEVEL SEMIVOLATILES BY 8270D				**Matrix:** Soil	
HS20011451-01	SO-1620-SG22 (0.5-1) 20200129	29 Jan 2020 09:45		31 Jan 2020 07:28	03 Feb 2020 19:59	1
HS20011451-02	SO-1620-SG22 (5.5-6) 20200129	29 Jan 2020 10:30		31 Jan 2020 07:28	31 Jan 2020 20:29	1
HS20011451-03	SO-1620-SG21 (0.5-1) 20200129	29 Jan 2020 11:30		31 Jan 2020 07:28	03 Feb 2020 20:18	1
HS20011451-04	SO-1620-SG21 (5.5-6) 20200129	29 Jan 2020 14:15		31 Jan 2020 07:28	31 Jan 2020 21:07	1
Batch ID: R355572 (0)	**Test Name :** VOLATILES BY SW8260C				**Matrix:** Soil	
HS20011451-01	SO-1620-SG22 (0.5-1) 20200129	29 Jan 2020 09:45			04 Feb 2020 03:37	1
HS20011451-02	SO-1620-SG22 (5.5-6) 20200129	29 Jan 2020 10:30			04 Feb 2020 03:59	1
HS20011451-03	SO-1620-SG21 (0.5-1) 20200129	29 Jan 2020 11:30			04 Feb 2020 04:22	1
HS20011451-04	SO-1620-SG21 (5.5-6) 20200129	29 Jan 2020 14:15			04 Feb 2020 04:45	1
Batch ID: R355975 (0)	**Test Name :** MOISTURE - ASTM D2216				**Matrix:** Soil	
HS20011451-01	SO-1620-SG22 (0.5-1) 20200129	29 Jan 2020 09:45			10 Feb 2020 08:28	1
HS20011451-02	SO-1620-SG22 (5.5-6) 20200129	29 Jan 2020 10:30			10 Feb 2020 08:28	1
HS20011451-03	SO-1620-SG21 (0.5-1) 20200129	29 Jan 2020 11:30			10 Feb 2020 08:28	1
HS20011451-04	SO-1620-SG21 (5.5-6) 20200129	29 Jan 2020 14:15			10 Feb 2020 08:28	1

WorkOrder: HS20011451
InstrumentID: SV-7
Test Code: 8270_LOW_S
Test Number: SW8270
Test Name: Low-Level Semivolatiles by 8270D

METHOD DETECTION / REPORTING LIMITS

Matrix: Solid **Units:** mg/Kg

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Naphthalene	91-20-3	0.0017	0.0018	0.00060	0.0033
S	2-Fluorobiphenyl	321-60-8	0	0	0	0
S	4-Terphenyl-d14	1718-51-0	0	0	0	0
S	Nitrobenzene-d5	4165-60-0	0	0	0	0

WorkOrder: HS20011451
InstrumentID: VOA8
Test Code: 8260_S
Test Number: SW8260
Test Name: Volatiles by SW8260C

METHOD DETECTION / REPORTING LIMITS

Matrix: Solid **Units:** mg/Kg

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Benzene	71-43-2	0.0012	0.0013	0.00050	0.0050
A	Ethylbenzene	100-41-4	0.0012	0.0014	0.00070	0.0050
A	Xylenes, Total	1330-20-7	0.0012	0.0014	0.0010	0.0050
S	1,2-Dichloroethane-d4	17060-07-0	0	0	0	0
S	4-Bromofluorobenzene	460-00-4	0	0	0	0
S	Dibromofluoromethane	1868-53-7	0	0	0	0
S	Toluene-d8	2037-26-5	0	0	0	0

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20011451

QC BATCH REPORT

Batch ID: 150183 (0) **Instrument: SV-7** **Method: LOW-LEVEL SEMIVOLATILES BY 8270D**

MBLK Sample ID: **MBLK-150183** Units: **ug/Kg** Analysis Date: **31-Jan-2020 10:33**
Client ID: Run ID: **SV-7_355477** SeqNo: **5455791** PrepDate: **31-Jan-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	U	3.3								
Surr: 2-Fluorobiphenyl	*154.1*	*0*	*167*	*0*	*92.3*	*43 - 125*				
Surr: 4-Terphenyl-d14	*171.7*	*0*	*167*	*0*	*103*	*32 - 125*				
Surr: Nitrobenzene-d5	*156.1*	*0*	*167*	*0*	*93.5*	*37 - 125*				

LCS Sample ID: **LCS-150183** Units: **ug/Kg** Analysis Date: **31-Jan-2020 10:52**
Client ID: Run ID: **SV-7_355477** SeqNo: **5455792** PrepDate: **31-Jan-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	153	3.3	167	0	91.6	50 - 125				
Surr: 2-Fluorobiphenyl	*151.2*	*0*	*167*	*0*	*90.6*	*43 - 125*				
Surr: 4-Terphenyl-d14	*157.9*	*0*	*167*	*0*	*94.5*	*32 - 125*				
Surr: Nitrobenzene-d5	*157.8*	*0*	*167*	*0*	*94.5*	*37 - 125*				

MS Sample ID: **HS20011422-01MS** Units: **ug/Kg** Analysis Date: **31-Jan-2020 12:28**
Client ID: Run ID: **SV-7_355477** SeqNo: **5455797** PrepDate: **31-Jan-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	132.7	3.3	166.9	5.281	76.3	50 - 125				
Surr: 2-Fluorobiphenyl	*135.6*	*0*	*166.9*	*0*	*81.2*	*43 - 125*				
Surr: 4-Terphenyl-d14	*161.8*	*0*	*166.9*	*0*	*96.9*	*32 - 125*				
Surr: Nitrobenzene-d5	*118.8*	*0*	*166.9*	*0*	*71.2*	*37 - 125*				

MSD Sample ID: **HS20011422-01MSD** Units: **ug/Kg** Analysis Date: **31-Jan-2020 12:47**
Client ID: Run ID: **SV-7_355477** SeqNo: **5455798** PrepDate: **31-Jan-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	83.57	3.3	166.8	5.281	46.9	50 - 125	132.7	45.4	30	SR
Surr: 2-Fluorobiphenyl	*80.37*	*0*	*166.8*	*0*	*48.2*	*43 - 125*	*135.6*	*51.1*	*30*	R
Surr: 4-Terphenyl-d14	*154.8*	*0*	*166.8*	*0*	*92.8*	*32 - 125*	*161.8*	*4.43*	*30*	
Surr: Nitrobenzene-d5	*79.51*	*0*	*166.8*	*0*	*47.7*	*37 - 125*	*118.8*	*39.7*	*30*	R

The following samples were analyzed in this batch: HS20011451-01 HS20011451-02 HS20011451-03 HS20011451-04

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20011451

QC BATCH REPORT

Batch ID: R355572 (0) **Instrument: VOA8** **Method: VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKS2-020320** Units: **ug/Kg** Analysis Date: **03-Feb-2020 21:08**
Client ID: Run ID: **VOA8_355572** SeqNo: **5457712** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	5.0								
Ethylbenzene	U	5.0								
Xylenes, Total	U	5.0								
Surr: 1,2-Dichloroethane-d4	*55.45*	*0*	*50*	*0*	*111*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*53*	*0*	*50*	*0*	*106*	*80 - 120*				
Surr: Dibromofluoromethane	*54.1*	*0*	*50*	*0*	*108*	*80 - 119*				
Surr: Toluene-d8	*52.29*	*0*	*50*	*0*	*105*	*81 - 118*				

LCS Sample ID: **VLCSS2-020320** Units: **ug/Kg** Analysis Date: **03-Feb-2020 20:22**
Client ID: Run ID: **VOA8_355572** SeqNo: **5457711** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	49.8	5.0	50	0	99.6	75 - 124				
Ethylbenzene	48.47	5.0	50	0	96.9	70 - 123				
Xylenes, Total	149.3	5.0	150	0	99.5	77 - 128				
Surr: 1,2-Dichloroethane-d4	*60.1*	*0*	*50*	*0*	*120*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*53.76*	*0*	*50*	*0*	*108*	*80 - 120*				
Surr: Dibromofluoromethane	*55.9*	*0*	*50*	*0*	*112*	*80 - 119*				
Surr: Toluene-d8	*50.9*	*0*	*50*	*0*	*102*	*81 - 118*				

MS Sample ID: **HS20011456-02MS** Units: **ug/Kg** Analysis Date: **03-Feb-2020 21:54**
Client ID: Run ID: **VOA8_355572** SeqNo: **5457714** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	33.22	4.9	49	0	67.8	70 - 130				S
Ethylbenzene	29.37	4.9	49	0	59.9	70 - 130				S
Xylenes, Total	82.6	4.9	147	0	56.2	70 - 130				S
Surr: 1,2-Dichloroethane-d4	*61.13*	*0*	*49*	*0*	*125*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*55.77*	*0*	*49*	*0*	*114*	*70 - 130*				
Surr: Dibromofluoromethane	*55.83*	*0*	*49*	*0*	*114*	*70 - 130*				
Surr: Toluene-d8	*43.91*	*0*	*49*	*0*	*89.6*	*70 - 130*				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20011451

QC BATCH REPORT

Batch ID: R355572 (0) **Instrument: VOA8** **Method: VOLATILES BY SW8260C**

MSD Sample ID: **HS20011456-02MSD** Units: **ug/Kg** Analysis Date: **03-Feb-2020 22:16**
Client ID: Run ID: **VOA8_355572** SeqNo: **5457715** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	32.95	5.0	50	0	65.9	70 - 130	33.22	0.823	30	S
Ethylbenzene	30.67	5.0	50	0	61.3	70 - 130	29.37	4.34	30	S
Xylenes, Total	89.52	5.0	150	0	59.7	70 - 130	82.6	8.04	30	S
Surr: 1,2-Dichloroethane-d4	*61.26*	*0*	*50*	*0*	*123*	*70 - 126*	*61.13*	*0.221*	*30*	
Surr: 4-Bromofluorobenzene	*54.06*	*0*	*50*	*0*	*108*	*70 - 130*	*55.77*	*3.11*	*30*	
Surr: Dibromofluoromethane	*58.31*	*0*	*50*	*0*	*117*	*70 - 130*	*55.83*	*4.35*	*30*	
Surr: Toluene-d8	*52.29*	*0*	*50*	*0*	*105*	*70 - 130*	*43.91*	*17.4*	*30*	

The following samples were analyzed in this batch: HS20011451-01 HS20011451-02 HS20011451-03 HS20011451-04

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20011451

QC BATCH REPORT

Batch ID: **R355975 (0)** **Instrument:** **Balance1** **Method:** **MOISTURE - ASTM D2216**

DUP Sample ID: **HS20011451-04DUP** Units: **wt%** Analysis Date: **10-Feb-2020 08:28**
Client ID: **SO-1620-SG21 (5.5-6) 20200129** Run ID: **Balance1_355975** SeqNo: **5466359** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Percent Moisture	17.3	0.0100					16.2	6.57	20	

The following samples were analyzed in this batch: HS20011451-01 HS20011451-02 HS20011451-03 HS20011451-04

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: **HS20011451**

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/Kg-dry	Milligrams per Kilogram- Dry weight corrected

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231 V009	22-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

Sample Receipt Checklist

Client Name: PBW
Work Order: HS20011451

Date/Time Received: **30-Jan-2020 16:40**
Received by: **JRM**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 30-Jan-2020 Date

Reviewed by: *Dane J. Wacasey* eSignature — 5-Feb-2020 Date

Matrices: **Soil**

Carrier name: **Client**

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 ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:214102
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):	0.4C UC/C	IR # 25
Cooler(s)/Kit(s):	44381	
Date/Time sample(s) sent to storage:	01/30/2020 21:00	

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: Sample count differ COC=5 Rec'd 4 containers; all 2oz amber bottles empty

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 For

Page 1 of 1

COC ID: 214102

HS20011451

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	1620-11-Rev0 SR 92688
Company Name	Golder Associates Inc.	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	8260_S (5652652 B,E,X)
B	8270_LOW_S (5632532 SVOC - Naphthalene only)
C	MOIST_ASTM (5631931 Gen.Chem. MOIST%)
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	SO-1620-SG22 (0.5-1) 20200129	1-29-20	0945	Soil	8,9	5	X	X	X								
2	SG22 (5.5-6)		1030														
3	SG21 (0.5-1)		1130														
4	SG21 (5.5-6)		1415														
5	SG20 (0.5-1)		1500														
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Anthony Reid

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:

	Date:	Time:	
Relinquished by:	1-30-20	1640	Received by:
Relinquished by:	1/30/20	16:40	Received by (Laboratory): J. Mussman
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes: UPRR HWPW 1620-11

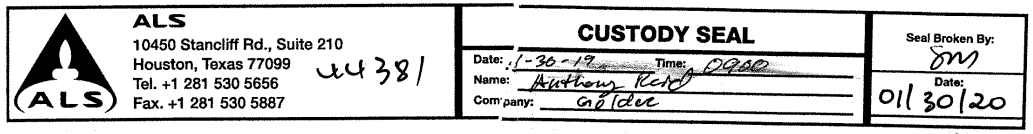
Cooler ID	Cooler Temp.
	UC
44381	2.4
	IR25
	1-0-0

QC Package: (Check One Box Below)

- [ ] Level II Std QC
- [ ] Level III Std QC/Raw Data
- [ ] 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.



ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

u4381

CUSTODY SEAL

Date: 1-30-19 Time: 0900
Name: Anthony Reid
Company: Golder

Seal Broken By: DM
Date: 01/30/20

u4381 JAN 30 2020

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

February 14, 2020

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

Work Order: **HS20020120**

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

Dear Eric,

ALS Environmental received 9 sample(s) on Feb 04, 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: DAYNA.FISHER
Dane J. Wacasey

Client:	Golder Associates Inc.	**TRRP Laboratory Data Package Cover Page**
Project:	Houston TX-Wood Preserving Works	
WorkOrder:	**HS20020120**	

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	
WorkOrder:	**HS20020120**	

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: 02/14/2020				
Project Name: Houston TX-Wood Preserving Works			Laboratory Job Number: HS20020120				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 150335, R355926, R356283				
#[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				
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			1
		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: 02/14/2020				
Project Name: Houston TX-Wood Preserving Works			Laboratory Job Number: HS20020120				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 150335, R355926, R356283				
#[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: 02/14/2020
Project Name: Houston TX-Wood Preserving Works	Laboratory Job Number: HS20020120
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 150335, R355926, R356283

ER#[5]	Description
1	Batch R355926, Volatiles by Method SW8260, Sample HS20020179-09, MS and MSD were performed on an unrelated sample.

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
Work Order: HS20020120

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20020120-01	SO-1620-SG-18(0.5-1)-2020203	Soil		03-Feb-2020 09:45	04-Feb-2020 13:00	☐
HS20020120-02	SO-1620-SG-18(5.5-6)-2020203	Soil		03-Feb-2020 10:00	04-Feb-2020 13:00	☐
HS20020120-03	SO-1620-SG-9(0.5-1)-2020203	Soil		03-Feb-2020 11:00	04-Feb-2020 13:00	☐
HS20020120-04	SO-1620-SG-9(5.5-6)-2020203	Soil		03-Feb-2020 11:35	04-Feb-2020 13:00	☐
HS20020120-05	SO-1620-SG-13(0.5-1)-2020203	Soil		03-Feb-2020 14:15	04-Feb-2020 13:00	☐
HS20020120-06	SO-1620-SG-13(5.5-6)-2020203	Soil		03-Feb-2020 14:45	04-Feb-2020 13:00	☐
HS20020120-07	SO-1620-SG-3(0.5-1)-2020203	Soil		03-Feb-2020 12:10	04-Feb-2020 13:00	☑
HS20020120-08	SO-1620-SG-3(5.5-6)-2020203	Soil		03-Feb-2020 12:40	04-Feb-2020 13:00	☑
HS20020120-09	SO-1620-DUP1-2020203	Soil		03-Feb-2020 12:40	04-Feb-2020 13:00	☐

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG-18(0.5-1)-2020203
Collection Date: 03-Feb-2020 09:45

ANALYTICAL REPORT
WorkOrder:HS20020120
Lab ID:HS20020120-01
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: QX
Benzene	**0.0034**	J	**0.00048**	**0.0048**	**mg/Kg-dry**	1	08-Feb-2020 18:34
Ethylbenzene	**0.0034**	J	**0.00067**	**0.0048**	**mg/Kg-dry**	1	08-Feb-2020 18:34
Xylenes, Total	**0.0056**		**0.00095**	**0.0048**	**mg/Kg-dry**	1	08-Feb-2020 18:34
Surr: 1,2-Dichloroethane-d4	*88.2*			*70-126*	*%REC*	*1*	*08-Feb-2020 18:34*
Surr: 4-Bromofluorobenzene	*96.3*			*70-130*	*%REC*	*1*	*08-Feb-2020 18:34*
Surr: Dibromofluoromethane	*89.4*			*70-130*	*%REC*	*1*	*08-Feb-2020 18:34*
Surr: Toluene-d8	*97.7*			*70-130*	*%REC*	*1*	*08-Feb-2020 18:34*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 05-Feb-2020		Analyst: LG
Naphthalene		U	0.00069	0.0038	mg/Kg-dry	1	06-Feb-2020 17:00
Surr: 2-Fluorobiphenyl	*87.0*			*43-125*	*%REC*	*1*	*06-Feb-2020 17:00*
Surr: 4-Terphenyl-d14	*84.2*			*32-125*	*%REC*	*1*	*06-Feb-2020 17:00*
Surr: Nitrobenzene-d5	*75.9*			*37-125*	*%REC*	*1*	*06-Feb-2020 17:00*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: MWG
Percent Moisture	**13.7**		**0.0100**	**0.0100**	**wt%**	1	13-Feb-2020 11:17

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG-18(5.5-6)-2020203
Collection Date: 03-Feb-2020 10:00

ANALYTICAL REPORT
WorkOrder:HS20020120
Lab ID:HS20020120-02
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: QX
Benzene		U	0.00054	0.0054	mg/Kg-dry	1	08-Feb-2020 18:59
Ethylbenzene		U	0.00076	0.0054	mg/Kg-dry	1	08-Feb-2020 18:59
Xylenes, Total		U	0.0011	0.0054	mg/Kg-dry	1	08-Feb-2020 18:59
Surr: 1,2-Dichloroethane-d4	*87.5*			*70-126*	*%REC*	*1*	*08-Feb-2020 18:59*
Surr: 4-Bromofluorobenzene	*96.8*			*70-130*	*%REC*	*1*	*08-Feb-2020 18:59*
Surr: Dibromofluoromethane	*90.7*			*70-130*	*%REC*	*1*	*08-Feb-2020 18:59*
Surr: Toluene-d8	*101*			*70-130*	*%REC*	*1*	*08-Feb-2020 18:59*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 05-Feb-2020		Analyst: LG
Naphthalene	**0.0041**		**0.00070**	**0.0038**	**mg/Kg-dry**	1	06-Feb-2020 17:19
Surr: 2-Fluorobiphenyl	*79.2*			*43-125*	*%REC*	*1*	*06-Feb-2020 17:19*
Surr: 4-Terphenyl-d14	*88.4*			*32-125*	*%REC*	*1*	*06-Feb-2020 17:19*
Surr: Nitrobenzene-d5	*77.3*			*37-125*	*%REC*	*1*	*06-Feb-2020 17:19*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: MWG
Percent Moisture	**14.8**		**0.0100**	**0.0100**	**wt%**	1	13-Feb-2020 11:17

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG-9(0.5-1)-2020203
Collection Date: 03-Feb-2020 11:00

ANALYTICAL REPORT
WorkOrder:HS20020120
Lab ID:HS20020120-03
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: QX
Benzene		U	0.00052	0.0052	mg/Kg-dry	1	08-Feb-2020 19:24
Ethylbenzene		U	0.00074	0.0052	mg/Kg-dry	1	08-Feb-2020 19:24
Xylenes, Total		U	0.0010	0.0052	mg/Kg-dry	1	08-Feb-2020 19:24
Surr: 1,2-Dichloroethane-d4	*88.2*			*70-126*	*%REC*	*1*	*08-Feb-2020 19:24*
Surr: 4-Bromofluorobenzene	*95.6*			*70-130*	*%REC*	*1*	*08-Feb-2020 19:24*
Surr: Dibromofluoromethane	*90.9*			*70-130*	*%REC*	*1*	*08-Feb-2020 19:24*
Surr: Toluene-d8	*99.9*			*70-130*	*%REC*	*1*	*08-Feb-2020 19:24*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 05-Feb-2020		Analyst: LG
Naphthalene	**0.0042**		**0.00074**	**0.0041**	**mg/Kg-dry**	1	06-Feb-2020 17:38
Surr: 2-Fluorobiphenyl	*81.0*			*43-125*	*%REC*	*1*	*06-Feb-2020 17:38*
Surr: 4-Terphenyl-d14	*88.8*			*32-125*	*%REC*	*1*	*06-Feb-2020 17:38*
Surr: Nitrobenzene-d5	*81.0*			*37-125*	*%REC*	*1*	*06-Feb-2020 17:38*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: MWG
Percent Moisture	**20.0**		**0.0100**	**0.0100**	**wt%**	1	13-Feb-2020 11:17

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG-9(5.5-6)-2020203
Collection Date: 03-Feb-2020 11:35

ANALYTICAL REPORT
WorkOrder:HS20020120
Lab ID:HS20020120-04
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: QX
Benzene		U	0.00082	0.0082	mg/Kg-dry	1	08-Feb-2020 19:49
Ethylbenzene		U	0.0012	0.0082	mg/Kg-dry	1	08-Feb-2020 19:49
Xylenes, Total		U	0.0016	0.0082	mg/Kg-dry	1	08-Feb-2020 19:49
Surr: 1,2-Dichloroethane-d4	*86.6*			*70-126*	*%REC*	*1*	*08-Feb-2020 19:49*
Surr: 4-Bromofluorobenzene	*95.2*			*70-130*	*%REC*	*1*	*08-Feb-2020 19:49*
Surr: Dibromofluoromethane	*92.6*			*70-130*	*%REC*	*1*	*08-Feb-2020 19:49*
Surr: Toluene-d8	*100.0*			*70-130*	*%REC*	*1*	*08-Feb-2020 19:49*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 05-Feb-2020		Analyst: LG
Naphthalene		U	0.00072	0.0039	mg/Kg-dry	1	06-Feb-2020 17:58
Surr: 2-Fluorobiphenyl	*82.1*			*43-125*	*%REC*	*1*	*06-Feb-2020 17:58*
Surr: 4-Terphenyl-d14	*80.5*			*32-125*	*%REC*	*1*	*06-Feb-2020 17:58*
Surr: Nitrobenzene-d5	*74.4*			*37-125*	*%REC*	*1*	*06-Feb-2020 17:58*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: MWG
Percent Moisture	**17.3**		**0.0100**	**0.0100**	**wt%**	1	13-Feb-2020 11:17

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG-13(0.5-1)-2020203
Collection Date: 03-Feb-2020 14:15

ANALYTICAL REPORT
WorkOrder:HS20020120
Lab ID:HS20020120-05
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: QX
Benzene		U	0.00076	0.0076	mg/Kg-dry	1	08-Feb-2020 20:14
Ethylbenzene		U	0.0011	0.0076	mg/Kg-dry	1	08-Feb-2020 20:14
Xylenes, Total		U	0.0015	0.0076	mg/Kg-dry	1	08-Feb-2020 20:14
Surr: 1,2-Dichloroethane-d4	*87.1*			*70-126*	*%REC*	*1*	*08-Feb-2020 20:14*
Surr: 4-Bromofluorobenzene	*97.1*			*70-130*	*%REC*	*1*	*08-Feb-2020 20:14*
Surr: Dibromofluoromethane	*89.2*			*70-130*	*%REC*	*1*	*08-Feb-2020 20:14*
Surr: Toluene-d8	*102*			*70-130*	*%REC*	*1*	*08-Feb-2020 20:14*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 05-Feb-2020		Analyst: LG
Naphthalene		U	0.00075	0.0041	mg/Kg-dry	1	06-Feb-2020 18:17
Surr: 2-Fluorobiphenyl	*78.0*			*43-125*	*%REC*	*1*	*06-Feb-2020 18:17*
Surr: 4-Terphenyl-d14	*80.9*			*32-125*	*%REC*	*1*	*06-Feb-2020 18:17*
Surr: Nitrobenzene-d5	*72.2*			*37-125*	*%REC*	*1*	*06-Feb-2020 18:17*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: MWG
Percent Moisture	**20.0**		**0.0100**	**0.0100**	**wt%**	1	13-Feb-2020 11:17

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG-13(5.5-6)-2020203
Collection Date: 03-Feb-2020 14:45

ANALYTICAL REPORT
WorkOrder:HS20020120
Lab ID:HS20020120-06
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: QX
Benzene		U	0.00049	0.0049	mg/Kg-dry	1	08-Feb-2020 20:39
Ethylbenzene		U	0.00068	0.0049	mg/Kg-dry	1	08-Feb-2020 20:39
Xylenes, Total		U	0.00097	0.0049	mg/Kg-dry	1	08-Feb-2020 20:39
Surr: 1,2-Dichloroethane-d4	*88.2*			*70-126*	*%REC*	*1*	*08-Feb-2020 20:39*
Surr: 4-Bromofluorobenzene	*96.6*			*70-130*	*%REC*	*1*	*08-Feb-2020 20:39*
Surr: Dibromofluoromethane	*92.8*			*70-130*	*%REC*	*1*	*08-Feb-2020 20:39*
Surr: Toluene-d8	*98.8*			*70-130*	*%REC*	*1*	*08-Feb-2020 20:39*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 05-Feb-2020		Analyst: LG
Naphthalene		U	0.00071	0.0039	mg/Kg-dry	1	06-Feb-2020 18:36
Surr: 2-Fluorobiphenyl	*69.5*			*43-125*	*%REC*	*1*	*06-Feb-2020 18:36*
Surr: 4-Terphenyl-d14	*83.0*			*32-125*	*%REC*	*1*	*06-Feb-2020 18:36*
Surr: Nitrobenzene-d5	*71.5*			*37-125*	*%REC*	*1*	*06-Feb-2020 18:36*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: MWG
Percent Moisture	**15.7**		**0.0100**	**0.0100**	**wt%**	1	13-Feb-2020 11:17

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-DUP1-2020203
Collection Date: 03-Feb-2020 12:40

ANALYTICAL REPORT
WorkOrder:HS20020120
Lab ID:HS20020120-09
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: QX
Benzene		U	0.00040	0.0040	mg/Kg-dry	1	08-Feb-2020 21:04
Ethylbenzene		U	0.00056	0.0040	mg/Kg-dry	1	08-Feb-2020 21:04
Xylenes, Total		U	0.00080	0.0040	mg/Kg-dry	1	08-Feb-2020 21:04
Surr: 1,2-Dichloroethane-d4	*88.7*			*70-126*	*%REC*	*1*	*08-Feb-2020 21:04*
Surr: 4-Bromofluorobenzene	*97.6*			*70-130*	*%REC*	*1*	*08-Feb-2020 21:04*
Surr: Dibromofluoromethane	*93.0*			*70-130*	*%REC*	*1*	*08-Feb-2020 21:04*
Surr: Toluene-d8	*101*			*70-130*	*%REC*	*1*	*08-Feb-2020 21:04*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 05-Feb-2020		Analyst: LG
Naphthalene		U	0.00069	0.0038	mg/Kg-dry	1	06-Feb-2020 18:55
Surr: 2-Fluorobiphenyl	*76.1*			*43-125*	*%REC*	*1*	*06-Feb-2020 18:55*
Surr: 4-Terphenyl-d14	*83.6*			*32-125*	*%REC*	*1*	*06-Feb-2020 18:55*
Surr: Nitrobenzene-d5	*75.4*			*37-125*	*%REC*	*1*	*06-Feb-2020 18:55*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: MWG
Percent Moisture	**14.2**		**0.0100**	**0.0100**	**wt%**	1	13-Feb-2020 11:17

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
WorkOrder: HS20020120

Batch ID: 3597 **Start Date:** 05 Feb 2020 10:00 **End Date:** 05 Feb 2020 10:00
Method: VOLATILES BY SW8260C

Sample ID	Container	Sample Wt/Vol	Final Volume	Weight Factor	Container Type
HS20020120-01	1	6.133 (g)	5 (mL)	0.82	TerraCore (5035A)
HS20020120-02	1	5.413 (g)	5 (mL)	0.92	TerraCore (5035A)
HS20020120-03	1	5.923 (g)	5 (mL)	0.84	TerraCore (5035A)
HS20020120-04	1	3.683 (g)	5 (mL)	1.36	TerraCore (5035A)
HS20020120-05	1	4.14 (g)	5 (mL)	1.21	TerraCore (5035A)
HS20020120-06	1	6.075 (g)	5 (mL)	0.82	TerraCore (5035A)
HS20020120-09	1	7.218 (g)	5 (mL)	0.69	TerraCore (5035A)

Batch ID: 150335 **Start Date:** 05 Feb 2020 11:25 **End Date:** 05 Feb 2020 15:30
Method: SV SOXHLET EXTRACT-LOWLEVEL-SW3541 **Prep Code:** 3541_B_LOW

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20020120-01		30.02 (g)	1 (mL)	0.03331
HS20020120-02		30.34 (g)	1 (mL)	0.03296
HS20020120-03		30.22 (g)	1 (mL)	0.03309
HS20020120-04		30.39 (g)	1 (mL)	0.03291
HS20020120-05		30.15 (g)	1 (mL)	0.03317
HS20020120-06		30.12 (g)	1 (mL)	0.0332
HS20020120-09		30.2 (g)	1 (mL)	0.03311

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020120

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 150335 (0)	**Test Name :** LOW-LEVEL SEMIVOLATILES BY 8270D				**Matrix:** Soil	
HS20020120-01	SO-1620-SG-18(0.5-1)-2020203	03 Feb 2020 09:45		05 Feb 2020 11:25	06 Feb 2020 17:00	1
HS20020120-02	SO-1620-SG-18(5.5-6)-2020203	03 Feb 2020 10:00		05 Feb 2020 11:25	06 Feb 2020 17:19	1
HS20020120-03	SO-1620-SG-9(0.5-1)-2020203	03 Feb 2020 11:00		05 Feb 2020 11:25	06 Feb 2020 17:38	1
HS20020120-04	SO-1620-SG-9(5.5-6)-2020203	03 Feb 2020 11:35		05 Feb 2020 11:25	06 Feb 2020 17:58	1
HS20020120-05	SO-1620-SG-13(0.5-1)-2020203	03 Feb 2020 14:15		05 Feb 2020 11:25	06 Feb 2020 18:17	1
HS20020120-06	SO-1620-SG-13(5.5-6)-2020203	03 Feb 2020 14:45		05 Feb 2020 11:25	06 Feb 2020 18:36	1
HS20020120-09	SO-1620-DUP1-2020203	03 Feb 2020 12:40		05 Feb 2020 11:25	06 Feb 2020 18:55	1
Batch ID: R355926 (0)	**Test Name :** VOLATILES BY SW8260C				**Matrix:** Soil	
HS20020120-01	SO-1620-SG-18(0.5-1)-2020203	03 Feb 2020 09:45			08 Feb 2020 18:34	1
HS20020120-02	SO-1620-SG-18(5.5-6)-2020203	03 Feb 2020 10:00			08 Feb 2020 18:59	1
HS20020120-03	SO-1620-SG-9(0.5-1)-2020203	03 Feb 2020 11:00			08 Feb 2020 19:24	1
HS20020120-04	SO-1620-SG-9(5.5-6)-2020203	03 Feb 2020 11:35			08 Feb 2020 19:49	1
HS20020120-05	SO-1620-SG-13(0.5-1)-2020203	03 Feb 2020 14:15			08 Feb 2020 20:14	1
HS20020120-06	SO-1620-SG-13(5.5-6)-2020203	03 Feb 2020 14:45			08 Feb 2020 20:39	1
HS20020120-09	SO-1620-DUP1-2020203	03 Feb 2020 12:40			08 Feb 2020 21:04	1
Batch ID: R356283 (0)	**Test Name :** MOISTURE - ASTM D2216				**Matrix:** Soil	
HS20020120-01	SO-1620-SG-18(0.5-1)-2020203	03 Feb 2020 09:45			13 Feb 2020 11:17	1
HS20020120-02	SO-1620-SG-18(5.5-6)-2020203	03 Feb 2020 10:00			13 Feb 2020 11:17	1
HS20020120-03	SO-1620-SG-9(0.5-1)-2020203	03 Feb 2020 11:00			13 Feb 2020 11:17	1
HS20020120-04	SO-1620-SG-9(5.5-6)-2020203	03 Feb 2020 11:35			13 Feb 2020 11:17	1
HS20020120-05	SO-1620-SG-13(0.5-1)-2020203	03 Feb 2020 14:15			13 Feb 2020 11:17	1
HS20020120-06	SO-1620-SG-13(5.5-6)-2020203	03 Feb 2020 14:45			13 Feb 2020 11:17	1
HS20020120-09	SO-1620-DUP1-2020203	03 Feb 2020 12:40			13 Feb 2020 11:17	1

WorkOrder: HS20020120
InstrumentID: SV-6
Test Code: 8270_LOW_S
Test Number: SW8270
Test Name: Low-Level Semivolatiles by 8270D

METHOD DETECTION / REPORTING LIMITS

Matrix: Solid **Units:** mg/Kg

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Naphthalene	91-20-3	0.0017	0.0019	0.00060	0.0033
S	2-Fluorobiphenyl	321-60-8	0	0	0	0
S	4-Terphenyl-d14	1718-51-0	0	0	0	0
S	Nitrobenzene-d5	4165-60-0	0	0	0	0

WorkOrder: HS20020120
InstrumentID: VOA5
Test Code: 8260_S
Test Number: SW8260
Test Name: Volatiles by SW8260C

METHOD DETECTION / REPORTING LIMITS

Matrix: Solid **Units:** mg/Kg

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Benzene	71-43-2	0.0012	0.0016	0.00050	0.0050
A	Ethylbenzene	100-41-4	0.0012	0.0016	0.00070	0.0050
A	Xylenes, Total	1330-20-7	0.0012	0.0016	0.0010	0.0050
S	1,2-Dichloroethane-d4	17060-07-0	0	0	0	0
S	4-Bromofluorobenzene	460-00-4	0	0	0	0
S	Dibromofluoromethane	1868-53-7	0	0	0	0
S	Toluene-d8	2037-26-5	0	0	0	0

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020120

QC BATCH REPORT

Batch ID: 150335 (0) **Instrument: SV-6** **Method: LOW-LEVEL SEMIVOLATILES BY 8270D**

MBLK Sample ID: **MBLK-150335** Units: **ug/Kg** Analysis Date: **06-Feb-2020 08:25**
Client ID: Run ID: **SV-6_355779** SeqNo: **5463959** PrepDate: **05-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	U	3.3								
Surr: 2-Fluorobiphenyl	*127.7*	*0*	*167*	*0*	*76.5*	*43 - 125*				
Surr: 4-Terphenyl-d14	*129.2*	*0*	*167*	*0*	*77.4*	*32 - 125*				
Surr: Nitrobenzene-d5	*111.8*	*0*	*167*	*0*	*66.9*	*37 - 125*				

LCS Sample ID: **LCS-150335** Units: **ug/Kg** Analysis Date: **06-Feb-2020 08:44**
Client ID: Run ID: **SV-6_355779** SeqNo: **5463960** PrepDate: **05-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	135.8	3.3	167	0	81.3	50 - 125				
Surr: 2-Fluorobiphenyl	*135.7*	*0*	*167*	*0*	*81.2*	*43 - 125*				
Surr: 4-Terphenyl-d14	*133.2*	*0*	*167*	*0*	*79.8*	*32 - 125*				
Surr: Nitrobenzene-d5	*124.9*	*0*	*167*	*0*	*74.8*	*37 - 125*				

MS Sample ID: **HS20020018-24MS** Units: **ug/Kg** Analysis Date: **06-Feb-2020 15:02**
Client ID: Run ID: **SV-6_355779** SeqNo: **5463962** PrepDate: **05-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	108.8	3.3	166.8	2.438	63.8	50 - 125				
Surr: 2-Fluorobiphenyl	*106.2*	*0*	*166.8*	*0*	*63.7*	*43 - 125*				
Surr: 4-Terphenyl-d14	*113.2*	*0*	*166.8*	*0*	*67.8*	*32 - 125*				
Surr: Nitrobenzene-d5	*104.5*	*0*	*166.8*	*0*	*62.6*	*37 - 125*				

MSD Sample ID: **HS20020018-24MSD** Units: **ug/Kg** Analysis Date: **06-Feb-2020 15:21**
Client ID: Run ID: **SV-6_355779** SeqNo: **5463963** PrepDate: **05-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	109.2	3.3	166.1	2.438	64.2	50 - 125	108.8	0.295	30	
Surr: 2-Fluorobiphenyl	*109.2*	*0*	*166.1*	*0*	*65.8*	*43 - 125*	*106.2*	*2.78*	*30*	
Surr: 4-Terphenyl-d14	*112.8*	*0*	*166.1*	*0*	*67.9*	*32 - 125*	*113.2*	*0.348*	*30*	
Surr: Nitrobenzene-d5	*97.48*	*0*	*166.1*	*0*	*58.7*	*37 - 125*	*104.5*	*6.96*	*30*	

The following samples were analyzed in this batch: HS20020120-01 HS20020120-02 HS20020120-03 HS20020120-04 HS20020120-05 HS20020120-06 HS20020120-09

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020120

QC BATCH REPORT

Batch ID: R355926 (0) **Instrument: VOA5** **Method: VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKS1-020820** Units: **ug/Kg** Analysis Date: **08-Feb-2020 12:20**
Client ID: Run ID: **VOA5_355926** SeqNo: **5465160** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	5.0								
Ethylbenzene	U	5.0								
Xylenes, Total	U	5.0								
Surr: 1,2-Dichloroethane-d4	*44.68*	*0*	*50*	*0*	*89.4*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*48.29*	*0*	*50*	*0*	*96.6*	*80 - 120*				
Surr: Dibromofluoromethane	*46.86*	*0*	*50*	*0*	*93.7*	*80 - 119*				
Surr: Toluene-d8	*49.02*	*0*	*50*	*0*	*98.0*	*81 - 118*				

LCS Sample ID: **VLCSS1-020820** Units: **ug/Kg** Analysis Date: **08-Feb-2020 11:30**
Client ID: Run ID: **VOA5_355926** SeqNo: **5465159** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	51.97	5.0	50	0	104	75 - 124				
Ethylbenzene	56.35	5.0	50	0	113	70 - 123				
Xylenes, Total	151.2	5.0	150	0	101	77 - 128				
Surr: 1,2-Dichloroethane-d4	*47.79*	*0*	*50*	*0*	*95.6*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*49.74*	*0*	*50*	*0*	*99.5*	*80 - 120*				
Surr: Dibromofluoromethane	*50.68*	*0*	*50*	*0*	*101*	*80 - 119*				
Surr: Toluene-d8	*49.98*	*0*	*50*	*0*	*100.0*	*81 - 118*				

MS Sample ID: **HS20020179-09MS** Units: **ug/Kg** Analysis Date: **08-Feb-2020 13:10**
Client ID: Run ID: **VOA5_355926** SeqNo: **5465162** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	34.97	4.8	48.5	0	72.1	70 - 130				
Ethylbenzene	34.05	4.8	48.5	0	70.2	70 - 130				
Xylenes, Total	92.59	4.8	145.5	0	63.6	70 - 130				S
Surr: 1,2-Dichloroethane-d4	*47.1*	*0*	*48.5*	*0*	*97.1*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*48.18*	*0*	*48.5*	*0*	*99.3*	*70 - 130*				
Surr: Dibromofluoromethane	*48.78*	*0*	*48.5*	*0*	*101*	*70 - 130*				
Surr: Toluene-d8	*48.47*	*0*	*48.5*	*0*	*99.9*	*70 - 130*				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020120

QC BATCH REPORT

Batch ID: R355926 (0) **Instrument: VOA5** **Method: VOLATILES BY SW8260C**

MSD Sample ID: **HS20020179-09MSD** Units: **ug/Kg** Analysis Date: **08-Feb-2020 13:35**
Client ID: Run ID: **VOA5_355926** SeqNo: **5465163** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	36.35	5.2	51.5	0	70.6	70 - 130	34.97	3.87	30	
Ethylbenzene	35.45	5.2	51.5	0	68.8	70 - 130	34.05	4.03	30	S
Xylenes, Total	96.33	5.2	154.5	0	62.4	70 - 130	92.59	3.97	30	S
Surr: 1,2-Dichloroethane-d4	*50.64*	*0*	*51.5*	*0*	*98.3*	*70 - 126*	*47.1*	*7.25*	*30*	
Surr: 4-Bromofluorobenzene	*51.32*	*0*	*51.5*	*0*	*99.6*	*70 - 130*	*48.18*	*6.3*	*30*	
Surr: Dibromofluoromethane	*52.29*	*0*	*51.5*	*0*	*102*	*70 - 130*	*48.78*	*6.95*	*30*	
Surr: Toluene-d8	*52.49*	*0*	*51.5*	*0*	*102*	*70 - 130*	*48.47*	*7.97*	*30*	

The following samples were analyzed in this batch: HS20020120-01 HS20020120-02 HS20020120-03 HS20020120-04 HS20020120-05 HS20020120-06 HS20020120-09

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020120

QC BATCH REPORT

Batch ID: **R356283 (0)** **Instrument:** **Balance1** **Method:** **MOISTURE - ASTM D2216**

DUP Sample ID: **HS20020120-09DUP** Units: **wt%** Analysis Date: **13-Feb-2020 11:17**
Client ID: **SO-1620-DUP1-2020203** Run ID: **Balance1_356283** SeqNo: **5473179** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Percent Moisture	13.6	0.0100					14.2	4.32	20	

The following samples were analyzed in this batch: HS20020120-01 HS20020120-02 HS20020120-03 HS20020120-04 HS20020120-05 HS20020120-06 HS20020120-09

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: **HS20020120**

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/Kg-dry	Milligrams per Kilogram- Dry weight corrected

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231 V009	22-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

Sample Receipt Checklist

Client Name: PBW
Work Order: HS20020120

Date/Time Received: **04-Feb-2020 13:00**
Received by: **PS**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 4-Feb-2020 Date

Reviewed by: *Dane J. Wacasey* eSignature — 5-Feb-2020 Date

Matrices: **Soil**

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 ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:214093
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):	1.6°C UC/C	IR # 25
Cooler(s)/Kit(s):	43453	
Date/Time sample(s) sent to storage:	02/04/2020 18:00	

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: Sample Count Differ all samples COC=5 Received 4.
Sample SG-3 (5.5-6) 2oz amber bulk received empty. (2/4/20: Per M. Hermiston, SG-3 samples will be re-collected. Place SG-3 samples on hold)

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 For

Page 1 of 1

COC ID: 214093

HS20020120

Golder Associates Inc.

Houston TX-Wood Preserving Works

Customer Information		Project Information		ALS Project Manager:
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works	
Work Order		Project Number	1620-11-Rev0 SR 92688	
Company Name	Golder Associates Inc.	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	8260_S (5652652 B,E,X)
B	8270_LOW_S (5632532 SVOC - Naphthalene only)
C	MOIST_ASTM (5631931 Gen.Chem. MOIST%)
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	SO-1620-S6-18 (0.5-1)-20200203	2/3/20	0945	Soil	8,9	5	X	X	X								
2	S6-18 (5.5-6)		1006														
3	S6-9 (0.5-1)		1100														
4	S6-9 (5.5-6)		1135														
5	S6-13 (0.5-1)	1405	1415														
6	S6-13 (5.5-6)		1445														
7	S6-3 (0.5-1)		1210														
8	S6-3 (5.5-6		1240														
9	DUP-1		1240														
10																	

Sampler(s) Please Print & Sign: Tim Nichols

Shipment Method: Lab Courier

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

Results Due Date:

	Date:	Time:	
Relinquished by:	2/4/20	0800	Received by:
Relinquished by:	2-4-20	0830	Received by (Laboratory):
Logged by (Laboratory):	2-4-20	1300	Checked by (Laboratory):

Notes: UPRR HWPW 1620-11

Cooler ID	Cooler Temp.
U3453	1.6

QC Package: (Check One Box Below)

- [ ] Level II Std QC
- [ ] Level III Std QC/Raw Data
- [ ] 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.

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

February 14, 2020

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

Work Order: **HS20020243**

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

Dear Eric,

ALS Environmental received 4 sample(s) on Feb 06, 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: DAYNA.FISHER
Dane J. Wacasey

Client:	Golder Associates Inc.	**TRRP Laboratory Data Package Cover Page**
Project:	Houston TX-Wood Preserving Works	
WorkOrder:	**HS20020243**	

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	
WorkOrder:	**HS20020243**	

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: 02/14/2020					
Project Name: Houston TX-Wood Preserving Works			Laboratory Job Number: HS20020243					
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 150435, R355985, R356088, R356209, R356241					
#[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				
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			1
		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				2
		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: 02/14/2020				
Project Name: Houston TX-Wood Preserving Works			Laboratory Job Number: HS20020243				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 150435, R355985, R356088, R356209, R356241				
#[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: 02/14/2020
Project Name: Houston TX-Wood Preserving Works	Laboratory Job Number: HS20020243
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 150435, R355985, R356088, R356209, R356241

ER#[5]	Description
1	Batch 150435, Semivolatiles by method SW8270, Sample HS20020244-01, MS was performed on an unrelated sample. Batch R355985, Volatiles by Method SW8260, Sample HS20020280-02, MS was performed on an unrelated sample.
2	Batch 150435, Semivolatiles by method SW8270, Sample SO-1620-SG11(0.5-1) 20200206, The GCMS semi-volatile extract of this sample was run at a dilution due to a high level of matrix interference.

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
Work Order: HS20020243

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20020243-01	SO-1620-SG03(0.5-1) 20200205	Soil		05-Feb-2020 10:30	06-Feb-2020 16:05	☐
HS20020243-02	SO-1620-SG03(5.5-6) 20200205	Soil		05-Feb-2020 10:45	06-Feb-2020 16:05	☐
HS20020243-03	SO-1620-SG11(0.5-1) 20200206	Soil		06-Feb-2020 13:40	06-Feb-2020 16:05	☐
HS20020243-04	SO-1620-SG11(5.5-6) 20200206	Soil		06-Feb-2020 14:00	06-Feb-2020 16:05	☐

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG03(0.5-1) 20200205
Collection Date: 05-Feb-2020 10:30

ANALYTICAL REPORT
WorkOrder:HS20020243
Lab ID:HS20020243-01
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: QX
Benzene	U		0.00037	0.0037	mg/Kg-dry	1	10-Feb-2020 21:02
Ethylbenzene	U		0.00052	0.0037	mg/Kg-dry	1	10-Feb-2020 21:02
Xylenes, Total	**0.0066**		**0.00075**	**0.0037**	**mg/Kg-dry**	1	10-Feb-2020 21:02
Surr: 1,2-Dichloroethane-d4	*102*			*70-126*	*%REC*	*1*	*10-Feb-2020 21:02*
Surr: 4-Bromofluorobenzene	*100*			*70-130*	*%REC*	*1*	*10-Feb-2020 21:02*
Surr: Dibromofluoromethane	*99.1*			*70-130*	*%REC*	*1*	*10-Feb-2020 21:02*
Surr: Toluene-d8	*101*			*70-130*	*%REC*	*1*	*10-Feb-2020 21:02*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 07-Feb-2020		Analyst: GEY
Naphthalene	**0.0018**	J	**0.00072**	**0.0040**	**mg/Kg-dry**	1	07-Feb-2020 20:28
Surr: 2-Fluorobiphenyl	*78.8*			*43-125*	*%REC*	*1*	*07-Feb-2020 20:28*
Surr: 4-Terphenyl-d14	*74.4*			*32-125*	*%REC*	*1*	*07-Feb-2020 20:28*
Surr: Nitrobenzene-d5	*56.9*			*37-125*	*%REC*	*1*	*07-Feb-2020 20:28*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**17.2**		**0.0100**	**0.0100**	**wt%**	1	12-Feb-2020 13:39

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG03(5.5-6) 20200205
Collection Date: 05-Feb-2020 10:45

ANALYTICAL REPORT
WorkOrder:HS20020243
Lab ID:HS20020243-02
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: QX
Benzene	U		0.00071	0.0071	mg/Kg-dry	1	11-Feb-2020 15:54
Ethylbenzene	U		0.0010	0.0071	mg/Kg-dry	1	11-Feb-2020 15:54
Xylenes, Total	U		0.0014	0.0071	mg/Kg-dry	1	11-Feb-2020 15:54
Surr: 1,2-Dichloroethane-d4	*114*			*70-126*	*%REC*	*1*	*11-Feb-2020 15:54*
Surr: 4-Bromofluorobenzene	*105*			*70-130*	*%REC*	*1*	*11-Feb-2020 15:54*
Surr: Dibromofluoromethane	*106*			*70-130*	*%REC*	*1*	*11-Feb-2020 15:54*
Surr: Toluene-d8	*106*			*70-130*	*%REC*	*1*	*11-Feb-2020 15:54*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 07-Feb-2020		Analyst: GEY
Naphthalene	**0.0017**	J	**0.00069**	**0.0038**	**mg/Kg-dry**	1	07-Feb-2020 20:47
Surr: 2-Fluorobiphenyl	*67.4*			*43-125*	*%REC*	*1*	*07-Feb-2020 20:47*
Surr: 4-Terphenyl-d14	*72.1*			*32-125*	*%REC*	*1*	*07-Feb-2020 20:47*
Surr: Nitrobenzene-d5	*50.2*			*37-125*	*%REC*	*1*	*07-Feb-2020 20:47*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**13.7**		**0.0100**	**0.0100**	**wt%**	1	12-Feb-2020 13:39

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG11(0.5-1) 20200206
Collection Date: 06-Feb-2020 13:40

ANALYTICAL REPORT
WorkOrder:HS20020243
Lab ID:HS20020243-03
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: QX
Benzene		U	0.00070	0.0070	mg/Kg-dry	1	11-Feb-2020 16:19
Ethylbenzene		U	0.00098	0.0070	mg/Kg-dry	1	11-Feb-2020 16:19
Xylenes, Total		U	0.0014	0.0070	mg/Kg-dry	1	11-Feb-2020 16:19
Surr: 1,2-Dichloroethane-d4	*118*			*70-126*	*%REC*	*1*	*11-Feb-2020 16:19*
Surr: 4-Bromofluorobenzene	*103*			*70-130*	*%REC*	*1*	*11-Feb-2020 16:19*
Surr: Dibromofluoromethane	*108*			*70-130*	*%REC*	*1*	*11-Feb-2020 16:19*
Surr: Toluene-d8	*106*			*70-130*	*%REC*	*1*	*11-Feb-2020 16:19*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 07-Feb-2020		Analyst: GEY
Naphthalene	**0.0084**	J	**0.0065**	**0.036**	**mg/Kg-dry**	10	07-Feb-2020 21:06
Surr: 2-Fluorobiphenyl	*88.6*			*43-125*	*%REC*	*10*	*07-Feb-2020 21:06*
Surr: 4-Terphenyl-d14	*82.4*			*32-125*	*%REC*	*10*	*07-Feb-2020 21:06*
Surr: Nitrobenzene-d5	*61.4*			*37-125*	*%REC*	*10*	*07-Feb-2020 21:06*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**8.37**		**0.0100**	**0.0100**	**wt%**	1	12-Feb-2020 13:39

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG11(5.5-6) 20200206
Collection Date: 06-Feb-2020 14:00

ANALYTICAL REPORT
WorkOrder:HS20020243
Lab ID:HS20020243-04
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene	U		0.00032	0.0032	mg/Kg-dry	1	13-Feb-2020 16:56
Ethylbenzene	U		0.00045	0.0032	mg/Kg-dry	1	13-Feb-2020 16:56
Xylenes, Total	U		0.00064	0.0032	mg/Kg-dry	1	13-Feb-2020 16:56
Surr: 1,2-Dichloroethane-d4	*89.0*			*70-126*	*%REC*	*1*	*13-Feb-2020 16:56*
Surr: 4-Bromofluorobenzene	*96.5*			*70-130*	*%REC*	*1*	*13-Feb-2020 16:56*
Surr: Dibromofluoromethane	*93.9*			*70-130*	*%REC*	*1*	*13-Feb-2020 16:56*
Surr: Toluene-d8	*102*			*70-130*	*%REC*	*1*	*13-Feb-2020 16:56*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 07-Feb-2020		Analyst: GEY
Naphthalene	**0.0011**	J	**0.00069**	**0.0038**	**mg/Kg-dry**	1	07-Feb-2020 21:25
Surr: 2-Fluorobiphenyl	*73.2*			*43-125*	*%REC*	*1*	*07-Feb-2020 21:25*
Surr: 4-Terphenyl-d14	*59.3*			*32-125*	*%REC*	*1*	*07-Feb-2020 21:25*
Surr: Nitrobenzene-d5	*49.7*			*37-125*	*%REC*	*1*	*07-Feb-2020 21:25*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**12.8**		**0.0100**	**0.0100**	**wt%**	1	12-Feb-2020 13:39

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
WorkOrder: HS20020243

Batch ID: 3602 **Start Date:** 07 Feb 2020 09:46 **End Date:** 07 Feb 2020 09:46
Method: VOLATILES BY SW8260C

Sample ID	Container	Sample Wt/Vol	Final Volume	Weight Factor	Container Type
HS20020243-01	1	8.032 (g)	5 (mL)	0.62	TerraCore (5035A)
HS20020243-02	1	4.05 (g)	5 (mL)	1.23	TerraCore (5035A)
HS20020243-03	1	3.902 (g)	5 (mL)	1.28	TerraCore (5035A)
HS20020243-04	1	8.912 (g)	5 (mL)	0.56	TerraCore (5035A)

Batch ID: 150435 **Start Date:** 07 Feb 2020 08:00 **End Date:** 07 Feb 2020 15:30
Method: SV SOXHLET EXTRACT-LOWLEVEL-SW3541 **Prep Code:** 3541_B_LOW

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20020243-01		30.01 (g)	1 (mL)	0.03332
HS20020243-02		30.05 (g)	1 (mL)	0.03328
HS20020243-03		30.04 (g)	1 (mL)	0.03329
HS20020243-04		30.09 (g)	1 (mL)	0.03323

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020243

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 150435 (0)	**Test Name :** LOW-LEVEL SEMIVOLATILES BY 8270D				**Matrix:** Soil	
HS20020243-01	SO-1620-SG03(0.5-1) 20200205	05 Feb 2020 10:30		07 Feb 2020 08:00	07 Feb 2020 20:28	1
HS20020243-02	SO-1620-SG03(5.5-6) 20200205	05 Feb 2020 10:45		07 Feb 2020 08:00	07 Feb 2020 20:47	1
HS20020243-03	SO-1620-SG11(0.5-1) 20200206	06 Feb 2020 13:40		07 Feb 2020 08:00	07 Feb 2020 21:06	10
HS20020243-04	SO-1620-SG11(5.5-6) 20200206	06 Feb 2020 14:00		07 Feb 2020 08:00	07 Feb 2020 21:25	1
Batch ID: R355985 (0)	**Test Name :** VOLATILES BY SW8260C				**Matrix:** Soil	
HS20020243-01	SO-1620-SG03(0.5-1) 20200205	05 Feb 2020 10:30			10 Feb 2020 21:02	1
Batch ID: R356088 (0)	**Test Name :** VOLATILES BY SW8260C				**Matrix:** Soil	
HS20020243-02	SO-1620-SG03(5.5-6) 20200205	05 Feb 2020 10:45			11 Feb 2020 15:54	1
HS20020243-03	SO-1620-SG11(0.5-1) 20200206	06 Feb 2020 13:40			11 Feb 2020 16:19	1
Batch ID: R356209 (0)	**Test Name :** MOISTURE - ASTM D2216				**Matrix:** Soil	
HS20020243-01	SO-1620-SG03(0.5-1) 20200205	05 Feb 2020 10:30			12 Feb 2020 13:39	1
HS20020243-02	SO-1620-SG03(5.5-6) 20200205	05 Feb 2020 10:45			12 Feb 2020 13:39	1
HS20020243-03	SO-1620-SG11(0.5-1) 20200206	06 Feb 2020 13:40			12 Feb 2020 13:39	1
HS20020243-04	SO-1620-SG11(5.5-6) 20200206	06 Feb 2020 14:00			12 Feb 2020 13:39	1
Batch ID: R356241 (0)	**Test Name :** VOLATILES BY SW8260C				**Matrix:** Soil	
HS20020243-04	SO-1620-SG11(5.5-6) 20200206	06 Feb 2020 14:00			13 Feb 2020 16:56	1

WorkOrder: HS20020243
InstrumentID: SV-7
Test Code: 8270_LOW_S
Test Number: SW8270
Test Name: Low-Level Semivolatiles by 8270D

METHOD DETECTION / REPORTING LIMITS

Matrix: Solid **Units:** mg/Kg

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Naphthalene	91-20-3	0.0017	0.0018	0.00060	0.0033
S	2-Fluorobiphenyl	321-60-8	0	0	0	0
S	4-Terphenyl-d14	1718-51-0	0	0	0	0
S	Nitrobenzene-d5	4165-60-0	0	0	0	0

WorkOrder: HS20020243
InstrumentID: VOA5
Test Code: 8260_S
Test Number: SW8260
Test Name: Volatiles by SW8260C

METHOD DETECTION / REPORTING LIMITS

Matrix: Solid **Units:** mg/Kg

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Benzene	71-43-2	0.0012	0.0016	0.00050	0.0050
A	Ethylbenzene	100-41-4	0.0012	0.0016	0.00070	0.0050
A	Xylenes, Total	1330-20-7	0.0012	0.0016	0.0010	0.0050
S	1,2-Dichloroethane-d4	17060-07-0	0	0	0	0
S	4-Bromofluorobenzene	460-00-4	0	0	0	0
S	Dibromofluoromethane	1868-53-7	0	0	0	0
S	Toluene-d8	2037-26-5	0	0	0	0

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020243

QC BATCH REPORT

Batch ID: 150435 (0) **Instrument: SV-7** **Method: LOW-LEVEL SEMIVOLATILES BY 8270D**

MBLK Sample ID: **MBLK-150435** Units: **ug/Kg** Analysis Date: **07-Feb-2020 11:34**
Client ID: Run ID: **SV-7_355905** SeqNo: **5464751** PrepDate: **07-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	U	3.3								
Surr: 2-Fluorobiphenyl	*103.6*	*0*	*167*	*0*	*62.1*	*43 - 125*				
Surr: 4-Terphenyl-d14	*123.6*	*0*	*167*	*0*	*74.0*	*32 - 125*				
Surr: Nitrobenzene-d5	*94.28*	*0*	*167*	*0*	*56.5*	*37 - 125*				

LCS Sample ID: **LCS-150435** Units: **ug/Kg** Analysis Date: **07-Feb-2020 11:53**
Client ID: Run ID: **SV-7_355905** SeqNo: **5464752** PrepDate: **07-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	120.9	3.3	167	0	72.4	50 - 125				
Surr: 2-Fluorobiphenyl	*129.4*	*0*	*167*	*0*	*77.5*	*43 - 125*				
Surr: 4-Terphenyl-d14	*135.5*	*0*	*167*	*0*	*81.1*	*32 - 125*				
Surr: Nitrobenzene-d5	*108.9*	*0*	*167*	*0*	*65.2*	*37 - 125*				

MS Sample ID: **HS20020244-01MS** Units: **ug/Kg** Analysis Date: **07-Feb-2020 16:39**
Client ID: Run ID: **SV-7_355905** SeqNo: **5465991** PrepDate: **07-Feb-2020** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	447.5	33	166.7	394	32.0	50 - 125				S
Surr: 2-Fluorobiphenyl	*150.4*	*0*	*166.7*	*0*	*90.2*	*43 - 125*				
Surr: 4-Terphenyl-d14	*105.7*	*0*	*166.7*	*0*	*63.4*	*32 - 125*				
Surr: Nitrobenzene-d5	*132*	*0*	*166.7*	*0*	*79.2*	*37 - 125*				

MSD Sample ID: **HS20020244-01MSD** Units: **ug/Kg** Analysis Date: **07-Feb-2020 16:58**
Client ID: Run ID: **SV-7_355905** SeqNo: **5465992** PrepDate: **07-Feb-2020** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	525.7	33	166.6	394	79.0	50 - 125	447.5	16.1	30	
Surr: 2-Fluorobiphenyl	*159.4*	*0*	*166.6*	*0*	*95.7*	*43 - 125*	*150.4*	*5.81*	*30*	
Surr: 4-Terphenyl-d14	*104.4*	*0*	*166.6*	*0*	*62.7*	*32 - 125*	*105.7*	*1.15*	*30*	
Surr: Nitrobenzene-d5	*158.3*	*0*	*166.6*	*0*	*95.0*	*37 - 125*	*132*	*18.1*	*30*	

The following samples were analyzed in this batch: HS20020243-01 HS20020243-02 HS20020243-03 HS20020243-04

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020243

QC BATCH REPORT

Batch ID: R355985 (0) **Instrument: VOA5** **Method: VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKS1-021020** Units: **ug/Kg** Analysis Date: **10-Feb-2020 12:43**
Client ID: Run ID: **VOA5_355985** SeqNo: **5466616** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	5.0								
Ethylbenzene	U	5.0								
Xylenes, Total	U	5.0								
Surr: 1,2-Dichloroethane-d4	*49.26*	*0*	*50*	*0*	*98.5*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*49.3*	*0*	*50*	*0*	*98.6*	*80 - 120*				
Surr: Dibromofluoromethane	*47.86*	*0*	*50*	*0*	*95.7*	*80 - 119*				
Surr: Toluene-d8	*49.84*	*0*	*50*	*0*	*99.7*	*81 - 118*				

LCS Sample ID: **VLCSS1-021020** Units: **ug/Kg** Analysis Date: **10-Feb-2020 11:53**
Client ID: Run ID: **VOA5_355985** SeqNo: **5466615** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	47.28	5.0	50	0	94.6	75 - 124				
Ethylbenzene	50.95	5.0	50	0	102	70 - 123				
Xylenes, Total	134.9	5.0	150	0	89.9	77 - 128				
Surr: 1,2-Dichloroethane-d4	*47.85*	*0*	*50*	*0*	*95.7*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*48.72*	*0*	*50*	*0*	*97.4*	*80 - 120*				
Surr: Dibromofluoromethane	*49.94*	*0*	*50*	*0*	*99.9*	*80 - 119*				
Surr: Toluene-d8	*48.92*	*0*	*50*	*0*	*97.8*	*81 - 118*				

MS Sample ID: **HS20020280-02MS** Units: **ug/Kg** Analysis Date: **10-Feb-2020 14:22**
Client ID: Run ID: **VOA5_355985** SeqNo: **5466619** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	33.09	4.8	48.5	0	68.2	70 - 130				S
Ethylbenzene	23.88	4.8	48.5	0	49.2	70 - 130				S
Xylenes, Total	61.38	4.8	145.5	4.78	38.9	70 - 130				S
Surr: 1,2-Dichloroethane-d4	*47.86*	*0*	*48.5*	*0*	*98.7*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*48.37*	*0*	*48.5*	*0*	*99.7*	*70 - 130*				
Surr: Dibromofluoromethane	*48.23*	*0*	*48.5*	*0*	*99.4*	*70 - 130*				
Surr: Toluene-d8	*48.16*	*0*	*48.5*	*0*	*99.3*	*70 - 130*				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020243

QC BATCH REPORT

Batch ID: R355985 (0) **Instrument: VOA5** **Method: VOLATILES BY SW8260C**

MSD Sample ID: **HS20020280-02MSD** Units: **ug/Kg** Analysis Date: **10-Feb-2020 14:47**
Client ID: Run ID: **VOA5_355985** SeqNo: **5466620** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	44.38	5.0	50.5	0	87.9	70 - 130	33.09	29.1	30	
Ethylbenzene	31.59	5.0	50.5	0	62.6	70 - 130	23.88	27.8	30	S
Xylenes, Total	80.08	5.0	151.5	4.78	49.7	70 - 130	61.38	26.4	30	S
Surr: 1,2-Dichloroethane-d4	*49.11*	*0*	*50.5*	*0*	*97.3*	*70 - 126*	*47.86*	*2.58*	*30*	
Surr: 4-Bromofluorobenzene	*50.61*	*0*	*50.5*	*0*	*100*	*70 - 130*	*48.37*	*4.52*	*30*	
Surr: Dibromofluoromethane	*51.23*	*0*	*50.5*	*0*	*101*	*70 - 130*	*48.23*	*6.04*	*30*	
Surr: Toluene-d8	*50.91*	*0*	*50.5*	*0*	*101*	*70 - 130*	*48.16*	*5.54*	*30*	

The following samples were analyzed in this batch: HS20020243-01

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020243

QC BATCH REPORT

Batch ID: R356088 (0) **Instrument: VOA5** **Method: VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKS1-022011** Units: **ug/Kg** Analysis Date: **11-Feb-2020 13:24**
Client ID: Run ID: **VOA5_356088** SeqNo: **5468643** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	5.0								
Ethylbenzene	U	5.0								
Xylenes, Total	U	5.0								
Surr: 1,2-Dichloroethane-d4	*59.86*	*0*	*50*	*0*	*120*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*52.54*	*0*	*50*	*0*	*105*	*80 - 120*				
Surr: Dibromofluoromethane	*53.86*	*0*	*50*	*0*	*108*	*80 - 119*				
Surr: Toluene-d8	*52.74*	*0*	*50*	*0*	*105*	*81 - 118*				

LCS Sample ID: **VLCSS1-022011** Units: **ug/Kg** Analysis Date: **11-Feb-2020 12:35**
Client ID: Run ID: **VOA5_356088** SeqNo: **5468642** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	59.21	5.0	50	0	118	75 - 124				
Ethylbenzene	59.17	5.0	50	0	118	70 - 123				
Xylenes, Total	157.5	5.0	150	0	105	77 - 128				
Surr: 1,2-Dichloroethane-d4	*57.36*	*0*	*50*	*0*	*115*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*53.37*	*0*	*50*	*0*	*107*	*80 - 120*				
Surr: Dibromofluoromethane	*56.8*	*0*	*50*	*0*	*114*	*80 - 119*				
Surr: Toluene-d8	*53.01*	*0*	*50*	*0*	*106*	*81 - 118*				

MS Sample ID: **HS20020288-11MS** Units: **ug/Kg** Analysis Date: **11-Feb-2020 14:39**
Client ID: Run ID: **VOA5_356088** SeqNo: **5468645** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	48.37	5.3	53	0	91.3	70 - 130				
Ethylbenzene	45.68	5.3	53	0	86.2	70 - 130				
Xylenes, Total	122.4	5.3	159	0	77.0	70 - 130				
Surr: 1,2-Dichloroethane-d4	*62.72*	*0*	*53*	*0*	*118*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*56.62*	*0*	*53*	*0*	*107*	*70 - 130*				
Surr: Dibromofluoromethane	*60.52*	*0*	*53*	*0*	*114*	*70 - 130*				
Surr: Toluene-d8	*56.29*	*0*	*53*	*0*	*106*	*70 - 130*				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020243

QC BATCH REPORT

Batch ID: R356088 (0) **Instrument: VOA5** **Method: VOLATILES BY SW8260C**

MSD Sample ID: **HS20020288-11MSD** Units: **ug/Kg** Analysis Date: **11-Feb-2020 15:04**
Client ID: Run ID: **VOA5_356088** SeqNo: **5468646** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Benzene	50.5	5.3	53	0	95.3	70 - 130	48.37	4.32	30	
Ethylbenzene	47.93	5.3	53	0	90.4	70 - 130	45.68	4.81	30	
Xylenes, Total	128.6	5.3	159	0	80.9	70 - 130	122.4	4.94	30	
Surr: 1,2-Dichloroethane-d4	*63.79*	*0*	*53*	*0*	*120*	*70 - 126*	*62.72*	*1.69*	*30*	
Surr: 4-Bromofluorobenzene	*57.15*	*0*	*53*	*0*	*108*	*70 - 130*	*56.62*	*0.93*	*30*	
Surr: Dibromofluoromethane	*60.69*	*0*	*53*	*0*	*115*	*70 - 130*	*60.52*	*0.289*	*30*	
Surr: Toluene-d8	*56.37*	*0*	*53*	*0*	*106*	*70 - 130*	*56.29*	*0.149*	*30*	

The following samples were analyzed in this batch: HS20020243-02 HS20020243-03

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020243

QC BATCH REPORT

Batch ID: R356241 (0) **Instrument: VOA5** **Method: VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKS1-021320** Units: **ug/Kg** Analysis Date: **13-Feb-2020 14:52**
Client ID: Run ID: **VOA5_356241** SeqNo: **5472076** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	5.0								
Ethylbenzene	U	5.0								
Xylenes, Total	U	5.0								
Surr: 1,2-Dichloroethane-d4	*44.98*	*0*	*50*	*0*	*90.0*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*49.47*	*0*	*50*	*0*	*98.9*	*80 - 120*				
Surr: Dibromofluoromethane	*48.02*	*0*	*50*	*0*	*96.0*	*80 - 119*				
Surr: Toluene-d8	*51.05*	*0*	*50*	*0*	*102*	*81 - 118*				

LCS Sample ID: **VLCSS1-021320** Units: **ug/Kg** Analysis Date: **13-Feb-2020 14:02**
Client ID: Run ID: **VOA5_356241** SeqNo: **5472075** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	57	5.0	50	0	114	75 - 124				
Ethylbenzene	59.18	5.0	50	0	118	70 - 123				
Xylenes, Total	178.5	5.0	150	0	119	77 - 128				
Surr: 1,2-Dichloroethane-d4	*48.05*	*0*	*50*	*0*	*96.1*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*49.7*	*0*	*50*	*0*	*99.4*	*80 - 120*				
Surr: Dibromofluoromethane	*50.37*	*0*	*50*	*0*	*101*	*80 - 119*				
Surr: Toluene-d8	*49.56*	*0*	*50*	*0*	*99.1*	*81 - 118*				

MS Sample ID: **HS20020243-04MS** Units: **ug/Kg** Analysis Date: **13-Feb-2020 16:07**
Client ID: **SO-1620-SG11(5.5-6) 20200206** Run ID: **VOA5_356241** SeqNo: **5472463** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	57.37	5.0	50	0	115	70 - 130				
Ethylbenzene	58.66	5.0	50	0	117	70 - 130				
Xylenes, Total	175	5.0	150	0	117	70 - 130				
Surr: 1,2-Dichloroethane-d4	*47.79*	*0*	*50*	*0*	*95.6*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*49.77*	*0*	*50*	*0*	*99.5*	*70 - 130*				
Surr: Dibromofluoromethane	*50.12*	*0*	*50*	*0*	*100*	*70 - 130*				
Surr: Toluene-d8	*50.23*	*0*	*50*	*0*	*100*	*70 - 130*				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020243

QC BATCH REPORT

Batch ID: R356241 (0) **Instrument:** VOA5 **Method:** VOLATILES BY SW8260C

MSD Sample ID: **HS20020243-04MSD** Units: **ug/Kg** Analysis Date: **13-Feb-2020 16:31**
Client ID: **SO-1620-SG11(5.5-6) 20200206** Run ID: **VOA5_356241** SeqNo: **5472464** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Benzene	54.71	5.2	52	0	105	70 - 130	57.37	4.74	30	
Ethylbenzene	54.49	5.2	52	0	105	70 - 130	58.66	7.38	30	
Xylenes, Total	166.4	5.2	156	0	107	70 - 130	175	5.07	30	
Surr: 1,2-Dichloroethane-d4	*49.83*	*0*	*52*	*0*	*95.8*	*70 - 126*	*47.79*	*4.17*	*30*	
Surr: 4-Bromofluorobenzene	*51.63*	*0*	*52*	*0*	*99.3*	*70 - 130*	*49.77*	*3.68*	*30*	
Surr: Dibromofluoromethane	*52.03*	*0*	*52*	*0*	*100*	*70 - 130*	*50.12*	*3.73*	*30*	
Surr: Toluene-d8	*52.62*	*0*	*52*	*0*	*101*	*70 - 130*	*50.23*	*4.64*	*30*	

The following samples were analyzed in this batch: HS20020243-04

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020243

QC BATCH REPORT

Batch ID: **R356209 (0)** **Instrument:** **Balance1** **Method:** **MOISTURE - ASTM D2216**

DUP Sample ID: **HS20020243-04DUP** Units: **wt%** Analysis Date: **12-Feb-2020 13:39**
Client ID: **SO-1620-SG11(5.5-6) 20200206** Run ID: **Balance1_356209** SeqNo: **5471563** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Percent Moisture	12.9	0.0100					12.8	0.778	20	

The following samples were analyzed in this batch: HS20020243-01 HS20020243-02 HS20020243-03 HS20020243-04

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: **HS20020243**

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/Kg-dry	Milligrams per Kilogram- Dry weight corrected

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231 V009	22-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

Sample Receipt Checklist

Client Name: PBW
Work Order: HS20020243

Date/Time Received: **06-Feb-2020 16:05**
Received by: **DDG**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 6-Feb-2020 Date

Reviewed by: *Dane J. Wacasey* eSignature — 10-Feb-2020 Date

Matrices: **Soil**

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 ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:214094
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):	1.2C UC/C	IR # 25
Cooler(s)/Kit(s):	44839	
Date/Time sample(s) sent to storage:	02/06/2020 20:00	

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: Sample Count differ COC= 5 Rec'd = 4

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 1

COC ID: 214094

HS20020243

Golder Associates Inc.
Houston TX-Wood Preserving Works

Customer Information		Project Information		ALS Project Manager:	
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works	A	8260_S (5652652 B,E,X)
Work Order		Project Number	1620-11-Rev0 SR 92688	B	8270_LOW_S (5632532 SVOC - Naphthalene only)
Company Name	Golder Associates Inc.	Bill To Company	Union Pacific Railroad- A/P	C	MOIST_ASTM (5631931 Gen.Chem. MOIST%)
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	SO-1620-SG03 (0.5-1)20200205	2-5-2020	1030	Soil	8,9	5	X	X	X								
2	SG03 (5.5-6)20200205	1	1045	|	|	|	X	X	X								
3	SG11 (0.5-1)20200206	2-6-2020	1340	|	|	|	X	X	X								
4	SG11 (5.5-6)20200206	1	1400	|	|	|	X	X	X								
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Anthony Reed

Shipment Method:

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

Results Due Date:

Relinquished by:	Date: 2-6-20	Time: 1445	Received by:	Notes: UPRR HWPW 1620-11	
Relinquished by:	Date: 2-6-20	Time: 1605	Received by (Laboratory):	Cooler ID	Cooler Temp.
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	44837	1.2

QC Package: (Check One Box Below)

- ☐ Level II Std QC
- ☐ Level III Std QC/Raw Date
- ☐ Level IV SW846/CLP
- ☐ Other _____
- ☒ 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.

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

February 17, 2020

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

Work Order: **HS20020308**

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

Dear Eric,

ALS Environmental received 4 sample(s) on Feb 07, 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: DAYNA.FISHER
Dane J. Wacasey

Client:	Golder Associates Inc.	**TRRP Laboratory Data Package Cover Page**
Project:	Houston TX-Wood Preserving Works	
WorkOrder:	**HS20020308**	

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.
Project:	Houston TX-Wood Preserving Works
WorkOrder:	**HS20020308**

TRRP Laboratory Data Package Cover Page

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: 02/17/2020				
Project Name: Houston TX-Wood Preserving Works			Laboratory Job Number: HS20020308				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 150518, R356283, R356340				
#[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				
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			1
		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				2
		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: 02/17/2020				
Project Name: Houston TX-Wood Preserving Works			Laboratory Job Number: HS20020308				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 150518, R356283, R356340				
#[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: 02/17/2020
Project Name: Houston TX-Wood Preserving Works	Laboratory Job Number: HS20020308
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 150518, R356283, R356340

ER#[5]	Description
1	Batch 150518, Semivolatiles by Method SW8270, Sample HS20020315-01, MS and MSD were performed on an unrelated sample
2	Batch 150518, Semivolatiles by Method SW8270, Sample SO-1620-SG10(0.5-1)20200207: One or more of the GCMS semi-volatile internal standards were recovered at <50%. There are no target analytes associated with the failing internal standards.

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
Work Order: HS20020308

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20020308-01	SO-1620-SG10(0.5-1)20200207	Soil		07-Feb-2020 11:10	07-Feb-2020 16:40	☐
HS20020308-02	SO-1620-SG10(5.5-6)20200207	Soil		07-Feb-2020 11:30	07-Feb-2020 16:40	☐
HS20020308-03	SO-1620-SG08(0.5-1)20200207	Soil		07-Feb-2020 14:00	07-Feb-2020 16:40	☐
HS20020308-04	SO-1620-SG08(5.5-6)20200207	Soil		07-Feb-2020 14:20	07-Feb-2020 16:40	☐

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG10(0.5-1)20200207
Collection Date: 07-Feb-2020 11:10

ANALYTICAL REPORT
WorkOrder:HS20020308
Lab ID:HS20020308-01
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00052	0.0052	mg/Kg-dry	1	15-Feb-2020 12:09
Ethylbenzene		U	0.00072	0.0052	mg/Kg-dry	1	15-Feb-2020 12:09
Xylenes, Total		U	0.0010	0.0052	mg/Kg-dry	1	15-Feb-2020 12:09
Surr: 1,2-Dichloroethane-d4	*73.8*			*70-126*	*%REC*	*1*	*15-Feb-2020 12:09*
Surr: 4-Bromofluorobenzene	*92.4*			*70-130*	*%REC*	*1*	*15-Feb-2020 12:09*
Surr: Dibromofluoromethane	*85.3*			*70-130*	*%REC*	*1*	*15-Feb-2020 12:09*
Surr: Toluene-d8	*109*			*70-130*	*%REC*	*1*	*15-Feb-2020 12:09*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 11-Feb-2020		Analyst: GEY
Naphthalene	**0.0056**		**0.00067**	**0.0037**	**mg/Kg-dry**	1	12-Feb-2020 00:24
Surr: 2-Fluorobiphenyl	*75.4*			*43-125*	*%REC*	*1*	*12-Feb-2020 00:24*
Surr: 4-Terphenyl-d14	*78.4*			*32-125*	*%REC*	*1*	*12-Feb-2020 00:24*
Surr: Nitrobenzene-d5	*42.3*			*37-125*	*%REC*	*1*	*12-Feb-2020 00:24*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: MWG
Percent Moisture	**11.1**		**0.0100**	**0.0100**	**wt%**	1	13-Feb-2020 11:17

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG10(5.5-6)20200207
Collection Date: 07-Feb-2020 11:30

ANALYTICAL REPORT
WorkOrder:HS20020308
Lab ID:HS20020308-02
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00039	0.0039	mg/Kg-dry	1	15-Feb-2020 12:32
Ethylbenzene		U	0.00054	0.0039	mg/Kg-dry	1	15-Feb-2020 12:32
Xylenes, Total		U	0.00077	0.0039	mg/Kg-dry	1	15-Feb-2020 12:32
Surr: 1,2-Dichloroethane-d4	*88.2*			*70-126*	*%REC*	*1*	*15-Feb-2020 12:32*
Surr: 4-Bromofluorobenzene	*94.6*			*70-130*	*%REC*	*1*	*15-Feb-2020 12:32*
Surr: Dibromofluoromethane	*90.9*			*70-130*	*%REC*	*1*	*15-Feb-2020 12:32*
Surr: Toluene-d8	*103*			*70-130*	*%REC*	*1*	*15-Feb-2020 12:32*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 11-Feb-2020		Analyst: GEY
Naphthalene		U	0.00072	0.0040	mg/Kg-dry	1	11-Feb-2020 20:36
Surr: 2-Fluorobiphenyl	*66.7*			*43-125*	*%REC*	*1*	*11-Feb-2020 20:36*
Surr: 4-Terphenyl-d14	*81.0*			*32-125*	*%REC*	*1*	*11-Feb-2020 20:36*
Surr: Nitrobenzene-d5	*59.6*			*37-125*	*%REC*	*1*	*11-Feb-2020 20:36*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: MWG
Percent Moisture	**17.0**		**0.0100**	**0.0100**	**wt%**	1	13-Feb-2020 11:17

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG08(0.5-1)20200207
Collection Date: 07-Feb-2020 14:00

ANALYTICAL REPORT
WorkOrder:HS20020308
Lab ID:HS20020308-03
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene	U		0.00062	0.0062	mg/Kg-dry	1	15-Feb-2020 12:55
Ethylbenzene	U		0.00087	0.0062	mg/Kg-dry	1	15-Feb-2020 12:55
Xylenes, Total	U		0.0012	0.0062	mg/Kg-dry	1	15-Feb-2020 12:55
Surr: 1,2-Dichloroethane-d4	*77.6*			*70-126*	*%REC*	*1*	*15-Feb-2020 12:55*
Surr: 4-Bromofluorobenzene	*93.0*			*70-130*	*%REC*	*1*	*15-Feb-2020 12:55*
Surr: Dibromofluoromethane	*88.5*			*70-130*	*%REC*	*1*	*15-Feb-2020 12:55*
Surr: Toluene-d8	*108*			*70-130*	*%REC*	*1*	*15-Feb-2020 12:55*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 11-Feb-2020		Analyst: GEY
Naphthalene	**0.0034**	J	**0.00068**	**0.0037**	**mg/Kg-dry**	1	11-Feb-2020 21:33
Surr: 2-Fluorobiphenyl	*68.7*			*43-125*	*%REC*	*1*	*11-Feb-2020 21:33*
Surr: 4-Terphenyl-d14	*69.0*			*32-125*	*%REC*	*1*	*11-Feb-2020 21:33*
Surr: Nitrobenzene-d5	*60.1*			*37-125*	*%REC*	*1*	*11-Feb-2020 21:33*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: MWG
Percent Moisture	**11.9**		**0.0100**	**0.0100**	**wt%**	1	13-Feb-2020 11:17

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG08(5.5-6)20200207
Collection Date: 07-Feb-2020 14:20

ANALYTICAL REPORT
WorkOrder:HS20020308
Lab ID:HS20020308-04
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene	U		0.00038	0.0038	mg/Kg-dry	1	15-Feb-2020 13:18
Ethylbenzene	U		0.00053	0.0038	mg/Kg-dry	1	15-Feb-2020 13:18
Xylenes, Total	U		0.00075	0.0038	mg/Kg-dry	1	15-Feb-2020 13:18
Surr: 1,2-Dichloroethane-d4	*77.6*			*70-126*	*%REC*	*1*	*15-Feb-2020 13:18*
Surr: 4-Bromofluorobenzene	*92.7*			*70-130*	*%REC*	*1*	*15-Feb-2020 13:18*
Surr: Dibromofluoromethane	*86.9*			*70-130*	*%REC*	*1*	*15-Feb-2020 13:18*
Surr: Toluene-d8	*107*			*70-130*	*%REC*	*1*	*15-Feb-2020 13:18*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 11-Feb-2020		Analyst: GEY
Naphthalene	**0.0014**	J	**0.00070**	**0.0039**	**mg/Kg-dry**	1	11-Feb-2020 20:55
Surr: 2-Fluorobiphenyl	*77.7*			*43-125*	*%REC*	*1*	*11-Feb-2020 20:55*
Surr: 4-Terphenyl-d14	*83.0*			*32-125*	*%REC*	*1*	*11-Feb-2020 20:55*
Surr: Nitrobenzene-d5	*67.9*			*37-125*	*%REC*	*1*	*11-Feb-2020 20:55*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: MWG
Percent Moisture	**15.1**		**0.0100**	**0.0100**	**wt%**	1	13-Feb-2020 11:17

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
WorkOrder: HS20020308

Batch ID: 3601 **Start Date:** 07 Feb 2020 09:08 **End Date:** 07 Feb 2020 09:08
Method: VOLATILES BY SW8260C

Sample ID	Container	Sample Wt/Vol	Final Volume	Weight Factor	Container Type
HS20020308-01	1	5.418 (g)	5 (mL)	0.92	TerraCore (5035A)
HS20020308-02	1	7.784 (g)	5 (mL)	0.64	TerraCore (5035A)
HS20020308-03	1	4.594 (g)	5 (mL)	1.09	TerraCore (5035A)
HS20020308-04	1	7.789 (g)	5 (mL)	0.64	TerraCore (5035A)

Batch ID: 150518 **Start Date:** 11 Feb 2020 10:30 **End Date:** 11 Feb 2020 13:30
Method: SV SOXHLET EXTRACT-LOWLEVEL-SW3541 **Prep Code:** 3541_B_LOW

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20020308-01		30.11 (g)	1 (mL)	0.03321
HS20020308-02		30.09 (g)	1 (mL)	0.03323
HS20020308-03		30.04 (g)	1 (mL)	0.03329
HS20020308-04		30.2 (g)	1 (mL)	0.03311

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020308

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 150518 (0)	**Test Name :** LOW-LEVEL SEMIVOLATILES BY 8270D				**Matrix:** Soil	
HS20020308-01	SO-1620-SG10(0.5-1) 20200207	07 Feb 2020 11:10		11 Feb 2020 10:30	12 Feb 2020 00:24	1
HS20020308-02	SO-1620-SG10(5.5-6) 20200207	07 Feb 2020 11:30		11 Feb 2020 10:30	11 Feb 2020 20:36	1
HS20020308-03	SO-1620-SG08(0.5-1) 20200207	07 Feb 2020 14:00		11 Feb 2020 10:30	11 Feb 2020 21:33	1
HS20020308-04	SO-1620-SG08(5.5-6) 20200207	07 Feb 2020 14:20		11 Feb 2020 10:30	11 Feb 2020 20:55	1
Batch ID: R356283 (0)	**Test Name :** MOISTURE - ASTM D2216				**Matrix:** Soil	
HS20020308-01	SO-1620-SG10(0.5-1) 20200207	07 Feb 2020 11:10			13 Feb 2020 11:17	1
HS20020308-02	SO-1620-SG10(5.5-6) 20200207	07 Feb 2020 11:30			13 Feb 2020 11:17	1
HS20020308-03	SO-1620-SG08(0.5-1) 20200207	07 Feb 2020 14:00			13 Feb 2020 11:17	1
HS20020308-04	SO-1620-SG08(5.5-6) 20200207	07 Feb 2020 14:20			13 Feb 2020 11:17	1
Batch ID: R356340 (0)	**Test Name :** VOLATILES BY SW8260C				**Matrix:** Soil	
HS20020308-01	SO-1620-SG10(0.5-1) 20200207	07 Feb 2020 11:10			15 Feb 2020 12:09	1
HS20020308-02	SO-1620-SG10(5.5-6) 20200207	07 Feb 2020 11:30			15 Feb 2020 12:32	1
HS20020308-03	SO-1620-SG08(0.5-1) 20200207	07 Feb 2020 14:00			15 Feb 2020 12:55	1
HS20020308-04	SO-1620-SG08(5.5-6) 20200207	07 Feb 2020 14:20			15 Feb 2020 13:18	1

WorkOrder: HS20020308
InstrumentID: SV-7
Test Code: 8270_LOW_S
Test Number: SW8270
Test Name: Low-Level Semivolatiles by 8270D

METHOD DETECTION / REPORTING LIMITS

Matrix: Solid **Units:** mg/Kg

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Naphthalene	91-20-3	0.0017	0.0018	0.00060	0.0033
S	2-Fluorobiphenyl	321-60-8	0	0	0	0
S	4-Terphenyl-d14	1718-51-0	0	0	0	0
S	Nitrobenzene-d5	4165-60-0	0	0	0	0

WorkOrder: HS20020308
InstrumentID: VOA8
Test Code: 8260_S
Test Number: SW8260
Test Name: Volatiles by SW8260C

METHOD DETECTION / REPORTING LIMITS

Matrix: Solid **Units:** mg/Kg

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Benzene	71-43-2	0.0012	0.0013	0.00050	0.0050
A	Ethylbenzene	100-41-4	0.0012	0.0014	0.00070	0.0050
A	Xylenes, Total	1330-20-7	0.0012	0.0014	0.0010	0.0050
S	1,2-Dichloroethane-d4	17060-07-0	0	0	0	0
S	4-Bromofluorobenzene	460-00-4	0	0	0	0
S	Dibromofluoromethane	1868-53-7	0	0	0	0
S	Toluene-d8	2037-26-5	0	0	0	0

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020308

QC BATCH REPORT

Batch ID: 150518 (0) **Instrument: SV-7** **Method: LOW-LEVEL SEMIVOLATILES BY 8270D**

MBLK Sample ID: **MBLK-150518** Units: **ug/Kg** Analysis Date: **11-Feb-2020 14:16**
Client ID: Run ID: **SV-7_356089** SeqNo: **5468650** PrepDate: **11-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	U	3.3								
Surr: 2-Fluorobiphenyl	*88.44*	*0*	*167*	*0*	*53.0*	*43 - 125*				
Surr: 4-Terphenyl-d14	*118.8*	*0*	*167*	*0*	*71.1*	*32 - 125*				
Surr: Nitrobenzene-d5	*110*	*0*	*167*	*0*	*65.9*	*37 - 125*				

LCS Sample ID: **LCS-150518** Units: **ug/Kg** Analysis Date: **11-Feb-2020 14:35**
Client ID: Run ID: **SV-7_356089** SeqNo: **5468651** PrepDate: **11-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	91.52	3.3	167	0	54.8	50 - 125				
Surr: 2-Fluorobiphenyl	*108*	*0*	*167*	*0*	*64.7*	*43 - 125*				
Surr: 4-Terphenyl-d14	*111.2*	*0*	*167*	*0*	*66.6*	*32 - 125*				
Surr: Nitrobenzene-d5	*69.56*	*0*	*167*	*0*	*41.7*	*37 - 125*				

MS Sample ID: **HS20020315-01MS** Units: **ug/Kg** Analysis Date: **11-Feb-2020 16:29**
Client ID: Run ID: **SV-7_356089** SeqNo: **5468655** PrepDate: **11-Feb-2020** DF: **100**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	5995	990	166.4	6348	-212	50 - 125				SO
Surr: 2-Fluorobiphenyl	*U*	*0*	*166.4*	*0*	*0*	*43 - 125*				S
Surr: 4-Terphenyl-d14	*U*	*0*	*166.4*	*0*	*0*	*32 - 125*				S
Surr: Nitrobenzene-d5	*U*	*0*	*166.4*	*0*	*0*	*37 - 125*				S

MSD Sample ID: **HS20020315-01MSD** Units: **ug/Kg** Analysis Date: **11-Feb-2020 16:48**
Client ID: Run ID: **SV-7_356089** SeqNo: **5468656** PrepDate: **11-Feb-2020** DF: **100**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	7056	990	166.2	6348	426	50 - 125	5995	16.3	30	SO
Surr: 2-Fluorobiphenyl	*U*	*0*	*166.2*	*0*	*0*	*43 - 125*	*0*	*0*	*30*	S
Surr: 4-Terphenyl-d14	*U*	*0*	*166.2*	*0*	*0*	*32 - 125*	*0*	*0*	*30*	S
Surr: Nitrobenzene-d5	*U*	*0*	*166.2*	*0*	*0*	*37 - 125*	*0*	*0*	*30*	S

The following samples were analyzed in this batch: HS20020308-01 HS20020308-02 HS20020308-03 HS20020308-04

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020308

QC BATCH REPORT

Batch ID: R356340 (0) **Instrument: VOA8** **Method: VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKS1-021520** Units: **ug/Kg** Analysis Date: **15-Feb-2020 10:37**
Client ID: Run ID: **VOA8_356340** SeqNo: **5474381** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	5.0								
Ethylbenzene	U	5.0								
Xylenes, Total	U	5.0								
Surr: 1,2-Dichloroethane-d4	*38.39*	*0*	*50*	*0*	*76.8*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*47.41*	*0*	*50*	*0*	*94.8*	*80 - 120*				
Surr: Dibromofluoromethane	*41.87*	*0*	*50*	*0*	*83.7*	*80 - 119*				
Surr: Toluene-d8	*54.45*	*0*	*50*	*0*	*109*	*81 - 118*				

LCS Sample ID: **VLCSS1-021520** Units: **ug/Kg** Analysis Date: **15-Feb-2020 09:52**
Client ID: Run ID: **VOA8_356340** SeqNo: **5474380** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	49.89	5.0	50	0	99.8	75 - 124				
Ethylbenzene	54.19	5.0	50	0	108	70 - 123				
Xylenes, Total	157.2	5.0	150	0	105	77 - 128				
Surr: 1,2-Dichloroethane-d4	*40.31*	*0*	*50*	*0*	*80.6*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*47.65*	*0*	*50*	*0*	*95.3*	*80 - 120*				
Surr: Dibromofluoromethane	*45.8*	*0*	*50*	*0*	*91.6*	*80 - 119*				
Surr: Toluene-d8	*52.33*	*0*	*50*	*0*	*105*	*81 - 118*				

MS Sample ID: **HS20020334-01MS** Units: **ug/Kg** Analysis Date: **15-Feb-2020 19:24**
Client ID: Run ID: **VOA8_356340** SeqNo: **5474402** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	51.68	5.0	49.5	0	104	70 - 130				
Ethylbenzene	51.59	5.0	49.5	0	104	70 - 130				
Xylenes, Total	152.9	5.0	148.5	0	103	70 - 130				
Surr: 1,2-Dichloroethane-d4	*47.55*	*0*	*49.5*	*0*	*96.1*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*50.16*	*0*	*49.5*	*0*	*101*	*70 - 130*				
Surr: Dibromofluoromethane	*49.39*	*0*	*49.5*	*0*	*99.8*	*70 - 130*				
Surr: Toluene-d8	*49.98*	*0*	*49.5*	*0*	*101*	*70 - 130*				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020308

QC BATCH REPORT

Batch ID: R356340 (0) **Instrument: VOA8** **Method: VOLATILES BY SW8260C**

MSD Sample ID: **HS20020334-01MSD** Units: **ug/Kg** Analysis Date: **15-Feb-2020 11:46**
Client ID: Run ID: **VOA8_356340** SeqNo: **5474383** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Benzene	49.35	5.0	50	0	98.7	70 - 130	51.68	4.61	30	
Ethylbenzene	50.79	5.0	50	0	102	70 - 130	51.59	1.58	30	
Xylenes, Total	148.4	5.0	150	0	99.0	70 - 130	152.9	2.96	30	
Surr: 1,2-Dichloroethane-d4	*44.94*	*0*	*50*	*0*	*89.9*	*70 - 126*	*47.55*	*5.64*	*30*	
Surr: 4-Bromofluorobenzene	*49.81*	*0*	*50*	*0*	*99.6*	*70 - 130*	*50.16*	*0.696*	*30*	
Surr: Dibromofluoromethane	*48.83*	*0*	*50*	*0*	*97.7*	*70 - 130*	*49.39*	*1.15*	*30*	
Surr: Toluene-d8	*51.03*	*0*	*50*	*0*	*102*	*70 - 130*	*49.98*	*2.08*	*30*	

The following samples were analyzed in this batch: HS20020308-01 HS20020308-02 HS20020308-03 HS20020308-04

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020308

QC BATCH REPORT

Batch ID: R356283 (0) **Instrument:** Balance1 **Method:** MOISTURE - ASTM D2216

DUP Sample ID: **HS20020120-09DUP** Units: **wt%** Analysis Date: **13-Feb-2020 11:17**
Client ID: Run ID: **Balance1_356283** SeqNo: **5473179** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Percent Moisture	13.6	0.0100					14.2	4.32	20	

The following samples were analyzed in this batch: HS20020308-01 HS20020308-02 HS20020308-03 HS20020308-04

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: **HS20020308**

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/Kg-dry	Milligrams per Kilogram- Dry weight corrected

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231 V009	22-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

Sample Receipt Checklist

Client Name: PBW
Work Order: HS20020308

Date/Time Received: **07-Feb-2020 16:40**
Received by: **DDG**

Checklist completed by: *Paresh M. Giga* eSignature — 7-Feb-2020 Date

Reviewed by: *Dane J. Wacasey* eSignature — 10-Feb-2020 Date

Matrices: **Soil**

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 ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:214095
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):	0.8c U/c	IR25	
Cooler(s)/Kit(s):	25749		
Date/Time sample(s) sent to storage:	2/7/2020 17:30		
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:

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 1

COC ID: 214095

HS20020308

Golder Associates Inc.
Houston TX-Wood Preserving Works

Customer Information		Project Information		ALS Project Manager:	
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works	A	8260_S (5652652 B,E,X)
Work Order		Project Number	1620-11-Rev0 SR 92688	B	8270_LOW_S (5632532 SVOC - Naphthalene only)
Company Name	Golder Associates Inc.	Bill To Company	Union Pacific Railroad- A/P	C	MOIST_ASTM (5631931 Gen.Chem. MOIST%)
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	SO-1620- SG10 (0.5-1) 20200207	2-7-20	1110	Soil	8,9	5	X	X	X								
2	SG10 (5.5-6) 20200207	2 7 20	1130														
3	SG08 (0.5-1) 20200207		1400														
4	SG08 (5.5-6) 20200207		1420														
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Anthony Retel

Shipment Method:

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: 2-7-20 Time: 1540 Received by:

Relinquished by: Date: 2-7-20 Time: 1646 Received by (Laboratory):

Logged by (Laboratory): Date: Time: Checked by (Laboratory):

Notes: UPRR HWPW 1620-11

Cooler ID	Cooler Temp.
25749	4.1C 0-8

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

ote:
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.

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

February 19, 2020

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

Work Order: **HS20020445**

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

Dear Eric,

ALS Environmental received 6 sample(s) on Feb 11, 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	
WorkOrder:	**HS20020445**	

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	
WorkOrder:	**HS20020445**	

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: 02/19/2020				
Project Name: Houston TX-Wood Preserving Works			Laboratory Job Number: HS20020445				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 150597,R356342,R356458				
#[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				
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				1
		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: 02/19/2020				
Project Name: Houston TX-Wood Preserving Works			Laboratory Job Number: HS20020445				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 150597,R356342,R356458				
#[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: 02/19/2020
Project Name: Houston TX-Wood Preserving Works	Laboratory Job Number: HS20020445
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 150597,R356342,R356458

ER#[5]	Description
1	Semivolatile Organics Method SW2870, sample SO-1620-SG02(0.5-1) 20200210, Internal standard Perylene-d12 shifted due to possible matrix effect. There are no target analyte associated with this internal standard.

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
Work Order: HS20020445

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20020445-01	SO-1620-SG05(0.5-1) 20200210	Soil		10-Feb-2020 09:50	11-Feb-2020 13:15	☐
HS20020445-02	SO-1620-SG05(5.5-6) 20200210	Soil		10-Feb-2020 10:10	11-Feb-2020 13:15	☐
HS20020445-03	SO-1620-SG04(0.5-1) 20200210	Soil		10-Feb-2020 13:20	11-Feb-2020 13:15	☐
HS20020445-04	SO-1620-SG04(5.5-6) 20200210	Soil		10-Feb-2020 13:30	11-Feb-2020 13:15	☐
HS20020445-05	SO-1620-SG02(0.5-1) 20200210	Soil		10-Feb-2020 15:50	11-Feb-2020 13:15	☐
HS20020445-06	SO-1620-SG02(5.5-6) 20200210	Soil		10-Feb-2020 16:00	11-Feb-2020 13:15	☐

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG05(0.5-1) 20200210
Collection Date: 10-Feb-2020 09:50

ANALYTICAL REPORT
WorkOrder:HS20020445
Lab ID:HS20020445-01
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00037	0.0037	mg/Kg-dry	1	15-Feb-2020 16:01
Ethylbenzene		U	0.00051	0.0037	mg/Kg-dry	1	15-Feb-2020 16:01
Xylenes, Total		U	0.00073	0.0037	mg/Kg-dry	1	15-Feb-2020 16:01
Surr: 1,2-Dichloroethane-d4	*86.9*			*70-126*	*%REC*	*1*	*15-Feb-2020 16:01*
Surr: 4-Bromofluorobenzene	*93.5*			*70-130*	*%REC*	*1*	*15-Feb-2020 16:01*
Surr: Dibromofluoromethane	*92.3*			*70-130*	*%REC*	*1*	*15-Feb-2020 16:01*
Surr: Toluene-d8	*105*			*70-130*	*%REC*	*1*	*15-Feb-2020 16:01*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 13-Feb-2020		Analyst: GEY
Naphthalene	**0.0049**		**0.00066**	**0.0037**	**mg/Kg-dry**	1	13-Feb-2020 23:20
Surr: 2-Fluorobiphenyl	*69.2*			*43-125*	*%REC*	*1*	*13-Feb-2020 23:20*
Surr: 4-Terphenyl-d14	*75.0*			*32-125*	*%REC*	*1*	*13-Feb-2020 23:20*
Surr: Nitrobenzene-d5	*50.2*			*37-125*	*%REC*	*1*	*13-Feb-2020 23:20*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**9.74**		**0.0100**	**0.0100**	**wt%**	1	17-Feb-2020 10:26

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG05(5.5-6) 20200210
Collection Date: 10-Feb-2020 10:10

ANALYTICAL REPORT
WorkOrder:HS20020445
Lab ID:HS20020445-02
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00078	0.0078	mg/Kg-dry	1	15-Feb-2020 16:26
Ethylbenzene		U	0.0011	0.0078	mg/Kg-dry	1	15-Feb-2020 16:26
Xylenes, Total		U	0.0016	0.0078	mg/Kg-dry	1	15-Feb-2020 16:26
Surr: 1,2-Dichloroethane-d4	*81.9*			*70-126*	*%REC*	*1*	*15-Feb-2020 16:26*
Surr: 4-Bromofluorobenzene	*93.7*			*70-130*	*%REC*	*1*	*15-Feb-2020 16:26*
Surr: Dibromofluoromethane	*91.5*			*70-130*	*%REC*	*1*	*15-Feb-2020 16:26*
Surr: Toluene-d8	*102*			*70-130*	*%REC*	*1*	*15-Feb-2020 16:26*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 13-Feb-2020		Analyst: GEY
Naphthalene		U	0.00074	0.0041	mg/Kg-dry	1	13-Feb-2020 19:32
Surr: 2-Fluorobiphenyl	*90.5*			*43-125*	*%REC*	*1*	*13-Feb-2020 19:32*
Surr: 4-Terphenyl-d14	*79.8*			*32-125*	*%REC*	*1*	*13-Feb-2020 19:32*
Surr: Nitrobenzene-d5	*47.3*			*37-125*	*%REC*	*1*	*13-Feb-2020 19:32*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**19.0**		**0.0100**	**0.0100**	**wt%**	1	17-Feb-2020 10:26

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG04(0.5-1) 20200210
Collection Date: 10-Feb-2020 13:20

ANALYTICAL REPORT
WorkOrder:HS20020445
Lab ID:HS20020445-03
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00044	0.0044	mg/Kg-dry	1	15-Feb-2020 16:51
Ethylbenzene		U	0.00061	0.0044	mg/Kg-dry	1	15-Feb-2020 16:51
Xylenes, Total		U	0.00087	0.0044	mg/Kg-dry	1	15-Feb-2020 16:51
Surr: 1,2-Dichloroethane-d4	*83.5*			*70-126*	*%REC*	*1*	*15-Feb-2020 16:51*
Surr: 4-Bromofluorobenzene	*94.7*			*70-130*	*%REC*	*1*	*15-Feb-2020 16:51*
Surr: Dibromofluoromethane	*92.7*			*70-130*	*%REC*	*1*	*15-Feb-2020 16:51*
Surr: Toluene-d8	*101*			*70-130*	*%REC*	*1*	*15-Feb-2020 16:51*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 13-Feb-2020		Analyst: GEY
Naphthalene		U	0.00071	0.0039	mg/Kg-dry	1	14-Feb-2020 13:25
Surr: 2-Fluorobiphenyl	*89.3*			*43-125*	*%REC*	*1*	*14-Feb-2020 13:25*
Surr: 4-Terphenyl-d14	*76.5*			*32-125*	*%REC*	*1*	*14-Feb-2020 13:25*
Surr: Nitrobenzene-d5	*57.9*			*37-125*	*%REC*	*1*	*14-Feb-2020 13:25*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**15.3**		**0.0100**	**0.0100**	**wt%**	1	17-Feb-2020 10:26

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG04(5.5-6) 20200210
Collection Date: 10-Feb-2020 13:30

ANALYTICAL REPORT
WorkOrder:HS20020445
Lab ID:HS20020445-04
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00068	0.0068	mg/Kg-dry	1	15-Feb-2020 17:16
Ethylbenzene		U	0.00096	0.0068	mg/Kg-dry	1	15-Feb-2020 17:16
Xylenes, Total		U	0.0014	0.0068	mg/Kg-dry	1	15-Feb-2020 17:16
Surr: 1,2-Dichloroethane-d4	*82.9*			*70-126*	*%REC*	*1*	*15-Feb-2020 17:16*
Surr: 4-Bromofluorobenzene	*95.6*			*70-130*	*%REC*	*1*	*15-Feb-2020 17:16*
Surr: Dibromofluoromethane	*91.9*			*70-130*	*%REC*	*1*	*15-Feb-2020 17:16*
Surr: Toluene-d8	*103*			*70-130*	*%REC*	*1*	*15-Feb-2020 17:16*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 13-Feb-2020		Analyst: GEY
Naphthalene		U	0.00072	0.0040	mg/Kg-dry	1	13-Feb-2020 20:10
Surr: 2-Fluorobiphenyl	*80.6*			*43-125*	*%REC*	*1*	*13-Feb-2020 20:10*
Surr: 4-Terphenyl-d14	*84.1*			*32-125*	*%REC*	*1*	*13-Feb-2020 20:10*
Surr: Nitrobenzene-d5	*56.1*			*37-125*	*%REC*	*1*	*13-Feb-2020 20:10*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**17.2**		**0.0100**	**0.0100**	**wt%**	1	17-Feb-2020 10:26

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG02(0.5-1) 20200210
Collection Date: 10-Feb-2020 15:50

ANALYTICAL REPORT
WorkOrder:HS20020445
Lab ID:HS20020445-05
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene	U		0.00053	0.0053	mg/Kg-dry	1	15-Feb-2020 17:41
Ethylbenzene	U		0.00075	0.0053	mg/Kg-dry	1	15-Feb-2020 17:41
Xylenes, Total	U		0.0011	0.0053	mg/Kg-dry	1	15-Feb-2020 17:41
Surr: 1,2-Dichloroethane-d4	*83.5*			*70-126*	*%REC*	*1*	*15-Feb-2020 17:41*
Surr: 4-Bromofluorobenzene	*93.5*			*70-130*	*%REC*	*1*	*15-Feb-2020 17:41*
Surr: Dibromofluoromethane	*92.6*			*70-130*	*%REC*	*1*	*15-Feb-2020 17:41*
Surr: Toluene-d8	*102*			*70-130*	*%REC*	*1*	*15-Feb-2020 17:41*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 13-Feb-2020		Analyst: GEY
Naphthalene	**0.0024**	J	**0.00071**	**0.0039**	**mg/Kg-dry**	1	14-Feb-2020 20:41
Surr: 2-Fluorobiphenyl	*66.7*			*43-125*	*%REC*	*1*	*14-Feb-2020 20:41*
Surr: 4-Terphenyl-d14	*82.0*			*32-125*	*%REC*	*1*	*14-Feb-2020 20:41*
Surr: Nitrobenzene-d5	*51.3*			*37-125*	*%REC*	*1*	*14-Feb-2020 20:41*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**15.6**		**0.0100**	**0.0100**	**wt%**	1	17-Feb-2020 10:26

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG02(5.5-6) 20200210
Collection Date: 10-Feb-2020 16:00

ANALYTICAL REPORT
WorkOrder:HS20020445
Lab ID:HS20020445-06
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00037	0.0037	mg/Kg-dry	1	15-Feb-2020 18:06
Ethylbenzene		U	0.00051	0.0037	mg/Kg-dry	1	15-Feb-2020 18:06
Xylenes, Total		U	0.00073	0.0037	mg/Kg-dry	1	15-Feb-2020 18:06
Surr: 1,2-Dichloroethane-d4	*84.3*			*70-126*	*%REC*	*1*	*15-Feb-2020 18:06*
Surr: 4-Bromofluorobenzene	*94.2*			*70-130*	*%REC*	*1*	*15-Feb-2020 18:06*
Surr: Dibromofluoromethane	*89.3*			*70-130*	*%REC*	*1*	*15-Feb-2020 18:06*
Surr: Toluene-d8	*101*			*70-130*	*%REC*	*1*	*15-Feb-2020 18:06*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 13-Feb-2020		Analyst: GEY
Naphthalene		U	0.00079	0.0043	mg/Kg-dry	1	13-Feb-2020 20:29
Surr: 2-Fluorobiphenyl	*62.8*			*43-125*	*%REC*	*1*	*13-Feb-2020 20:29*
Surr: 4-Terphenyl-d14	*75.3*			*32-125*	*%REC*	*1*	*13-Feb-2020 20:29*
Surr: Nitrobenzene-d5	*58.3*			*37-125*	*%REC*	*1*	*13-Feb-2020 20:29*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**23.8**		**0.0100**	**0.0100**	**wt%**	1	17-Feb-2020 10:26

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
WorkOrder: HS20020445

Batch ID: 3611 **Start Date:** 13 Feb 2020 12:33 **End Date:** 13 Feb 2020 12:33
Method: VOLATILES BY SW8260C

Sample ID	Container	Sample Wt/Vol	Final Volume	Weight Factor	Container Type
HS20020445-01	1	7.52 (g)	5 (mL)	0.66	TerraCore (5035A)
HS20020445-02	1	3.922 (g)	5 (mL)	1.27	TerraCore (5035A)
HS20020445-03	1	6.778 (g)	5 (mL)	0.74	TerraCore (5035A)
HS20020445-04	1	4.416 (g)	5 (mL)	1.13	TerraCore (5035A)
HS20020445-05	1	5.562 (g)	5 (mL)	0.9	TerraCore (5035A)
HS20020445-06	1	8.94 (g)	5 (mL)	0.56	TerraCore (5035A)

Batch ID: 150597 **Start Date:** 13 Feb 2020 11:26 **End Date:** 13 Feb 2020 16:00
Method: SV SOXHLET EXTRACT-LOWLEVEL-SW3541 **Prep Code:** 3541_B_LOW

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20020445-01		30.02 (g)	1 (mL)	0.03331
HS20020445-02		30.12 (g)	1 (mL)	0.0332
HS20020445-03		30.14 (g)	1 (mL)	0.03318
HS20020445-04		30.19 (g)	1 (mL)	0.03312
HS20020445-05		30.14 (g)	1 (mL)	0.03318
HS20020445-06		30.09 (g)	1 (mL)	0.03323

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020445

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 150597 (0)	**Test Name :** LOW-LEVEL SEMIVOLATILES BY 8270D				**Matrix:** Soil	
HS20020445-01	SO-1620-SG05(0.5-1) 20200210	10 Feb 2020 09:50		13 Feb 2020 11:26	13 Feb 2020 23:20	1
HS20020445-02	SO-1620-SG05(5.5-6) 20200210	10 Feb 2020 10:10		13 Feb 2020 11:26	13 Feb 2020 19:32	1
HS20020445-03	SO-1620-SG04(0.5-1) 20200210	10 Feb 2020 13:20		13 Feb 2020 11:26	14 Feb 2020 13:25	1
HS20020445-04	SO-1620-SG04(5.5-6) 20200210	10 Feb 2020 13:30		13 Feb 2020 11:26	13 Feb 2020 20:10	1
HS20020445-05	SO-1620-SG02(0.5-1) 20200210	10 Feb 2020 15:50		13 Feb 2020 11:26	14 Feb 2020 20:41	1
HS20020445-06	SO-1620-SG02(5.5-6) 20200210	10 Feb 2020 16:00		13 Feb 2020 11:26	13 Feb 2020 20:29	1
Batch ID: R356342 (0)	**Test Name :** VOLATILES BY SW8260C				**Matrix:** Soil	
HS20020445-01	SO-1620-SG05(0.5-1) 20200210	10 Feb 2020 09:50			15 Feb 2020 16:01	1
HS20020445-02	SO-1620-SG05(5.5-6) 20200210	10 Feb 2020 10:10			15 Feb 2020 16:26	1
HS20020445-03	SO-1620-SG04(0.5-1) 20200210	10 Feb 2020 13:20			15 Feb 2020 16:51	1
HS20020445-04	SO-1620-SG04(5.5-6) 20200210	10 Feb 2020 13:30			15 Feb 2020 17:16	1
HS20020445-05	SO-1620-SG02(0.5-1) 20200210	10 Feb 2020 15:50			15 Feb 2020 17:41	1
HS20020445-06	SO-1620-SG02(5.5-6) 20200210	10 Feb 2020 16:00			15 Feb 2020 18:06	1
Batch ID: R356458 (0)	**Test Name :** MOISTURE - ASTM D2216				**Matrix:** Soil	
HS20020445-01	SO-1620-SG05(0.5-1) 20200210	10 Feb 2020 09:50			17 Feb 2020 10:26	1
HS20020445-02	SO-1620-SG05(5.5-6) 20200210	10 Feb 2020 10:10			17 Feb 2020 10:26	1
HS20020445-03	SO-1620-SG04(0.5-1) 20200210	10 Feb 2020 13:20			17 Feb 2020 10:26	1
HS20020445-04	SO-1620-SG04(5.5-6) 20200210	10 Feb 2020 13:30			17 Feb 2020 10:26	1
HS20020445-05	SO-1620-SG02(0.5-1) 20200210	10 Feb 2020 15:50			17 Feb 2020 10:26	1
HS20020445-06	SO-1620-SG02(5.5-6) 20200210	10 Feb 2020 16:00			17 Feb 2020 10:26	1

WorkOrder: HS20020445
InstrumentID: SV-7
Test Code: 8270_LOW_S
Test Number: SW8270
Test Name: Low-Level Semivolatiles by 8270D

METHOD DETECTION / REPORTING LIMITS

Matrix: Solid **Units:** mg/Kg

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Naphthalene	91-20-3	0.0017	0.0018	0.00060	0.0033
S	2-Fluorobiphenyl	321-60-8	0	0	0	0
S	4-Terphenyl-d14	1718-51-0	0	0	0	0
S	Nitrobenzene-d5	4165-60-0	0	0	0	0

WorkOrder: HS20020445
InstrumentID: VOA5
Test Code: 8260_S
Test Number: SW8260
Test Name: Volatiles by SW8260C

METHOD DETECTION / REPORTING LIMITS

Matrix: Solid **Units:** mg/Kg

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Benzene	71-43-2	0.0012	0.0016	0.00050	0.0050
A	Ethylbenzene	100-41-4	0.0012	0.0016	0.00070	0.0050
A	Xylenes, Total	1330-20-7	0.0012	0.0016	0.0010	0.0050
S	1,2-Dichloroethane-d4	17060-07-0	0	0	0	0
S	4-Bromofluorobenzene	460-00-4	0	0	0	0
S	Dibromofluoromethane	1868-53-7	0	0	0	0
S	Toluene-d8	2037-26-5	0	0	0	0

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020445

QC BATCH REPORT

Batch ID: 150597 (0) **Instrument: SV-7** **Method: LOW-LEVEL SEMIVOLATILES BY 8270D**

MBLK Sample ID: **MBLK-150597** Units: **ug/Kg** Analysis Date: **13-Feb-2020 16:22**
Client ID: Run ID: **SV-7_356280** SeqNo: **5473119** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	U	3.3								
Surr: 2-Fluorobiphenyl	*128.7*	*0*	*167*	*0*	*77.1*	*43 - 125*				
Surr: 4-Terphenyl-d14	*146*	*0*	*167*	*0*	*87.4*	*32 - 125*				
Surr: Nitrobenzene-d5	*119.2*	*0*	*167*	*0*	*71.4*	*37 - 125*				

LCS Sample ID: **LCS-150597** Units: **ug/Kg** Analysis Date: **13-Feb-2020 16:41**
Client ID: Run ID: **SV-7_356280** SeqNo: **5473120** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	97.38	3.3	167	0	58.3	50 - 125				
Surr: 2-Fluorobiphenyl	*86.63*	*0*	*167*	*0*	*51.9*	*43 - 125*				
Surr: 4-Terphenyl-d14	*109.5*	*0*	*167*	*0*	*65.5*	*32 - 125*				
Surr: Nitrobenzene-d5	*117.4*	*0*	*167*	*0*	*70.3*	*37 - 125*				

MS Sample ID: **HS20020501-02MS** Units: **ug/Kg** Analysis Date: **14-Feb-2020 12:00**
Client ID: Run ID: **SV-7_356313** SeqNo: **5473790** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	150.7	3.3	166.6	3.15	88.6	50 - 125				
Surr: 2-Fluorobiphenyl	*147.3*	*0*	*166.6*	*0*	*88.5*	*43 - 125*				
Surr: 4-Terphenyl-d14	*144.9*	*0*	*166.6*	*0*	*87.0*	*32 - 125*				
Surr: Nitrobenzene-d5	*95.46*	*0*	*166.6*	*0*	*57.3*	*37 - 125*				

MSD Sample ID: **HS20020501-02MSD** Units: **ug/Kg** Analysis Date: **13-Feb-2020 19:13**
Client ID: Run ID: **SV-7_356280** SeqNo: **5473127** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	135.9	3.3	166.4	3.15	79.8	50 - 125	150.7	10.3	30	
Surr: 2-Fluorobiphenyl	*134.9*	*0*	*166.4*	*0*	*81.1*	*43 - 125*	*147.3*	*8.77*	*30*	
Surr: 4-Terphenyl-d14	*141*	*0*	*166.4*	*0*	*84.8*	*32 - 125*	*144.9*	*2.73*	*30*	
Surr: Nitrobenzene-d5	*109.9*	*0*	*166.4*	*0*	*66.0*	*37 - 125*	*95.46*	*14.1*	*30*	

The following samples were analyzed in this batch: HS20020445-01 HS20020445-02 HS20020445-03 HS20020445-04 HS20020445-05 HS20020445-06

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020445

QC BATCH REPORT

Batch ID: R356342 (0) **Instrument: VOA5** **Method: VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKS1-021520** Units: **ug/Kg** Analysis Date: **15-Feb-2020 10:38**
Client ID: Run ID: **VOA5_356342** SeqNo: **5474460** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	5.0								
Ethylbenzene	U	5.0								
Xylenes, Total	U	5.0								
Surr: 1,2-Dichloroethane-d4	*45.4*	*0*	*50*	*0*	*90.8*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*47.6*	*0*	*50*	*0*	*95.2*	*80 - 120*				
Surr: Dibromofluoromethane	*46.63*	*0*	*50*	*0*	*93.3*	*80 - 119*				
Surr: Toluene-d8	*49.33*	*0*	*50*	*0*	*98.7*	*81 - 118*				

LCS Sample ID: **VLCSS1-021520** Units: **ug/Kg** Analysis Date: **15-Feb-2020 09:48**
Client ID: Run ID: **VOA5_356342** SeqNo: **5474459** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	53.58	5.0	50	0	107	75 - 124				
Ethylbenzene	54.61	5.0	50	0	109	70 - 123				
Xylenes, Total	164.4	5.0	150	0	110	77 - 128				
Surr: 1,2-Dichloroethane-d4	*47.23*	*0*	*50*	*0*	*94.5*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*48.41*	*0*	*50*	*0*	*96.8*	*80 - 120*				
Surr: Dibromofluoromethane	*50.12*	*0*	*50*	*0*	*100*	*80 - 119*				
Surr: Toluene-d8	*49.87*	*0*	*50*	*0*	*99.7*	*81 - 118*				

MS Sample ID: **HS20020288-10MS** Units: **ug/Kg** Analysis Date: **15-Feb-2020 11:28**
Client ID: Run ID: **VOA5_356342** SeqNo: **5474462** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	45.6	4.8	48	0	95.0	70 - 130				
Ethylbenzene	42.51	4.8	48	0	88.6	70 - 130				
Xylenes, Total	129.8	4.8	144	0	90.1	70 - 130				
Surr: 1,2-Dichloroethane-d4	*44.43*	*0*	*48*	*0*	*92.6*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*47.23*	*0*	*48*	*0*	*98.4*	*70 - 130*				
Surr: Dibromofluoromethane	*46.9*	*0*	*48*	*0*	*97.7*	*70 - 130*				
Surr: Toluene-d8	*48.33*	*0*	*48*	*0*	*101*	*70 - 130*				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020445

QC BATCH REPORT

Batch ID: R356342 (0) **Instrument: VOA5** **Method: VOLATILES BY SW8260C**

MSD Sample ID: **HS20020288-10MSD** Units: **ug/Kg** Analysis Date: **15-Feb-2020 11:53**
Client ID: Run ID: **VOA5_356342** SeqNo: **5474463** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	37.07	4.8	48	0	77.2	70 - 130	45.6	20.6	30	
Ethylbenzene	35.46	4.8	48	0	73.9	70 - 130	42.51	18.1	30	
Xylenes, Total	106.4	4.8	144	0	73.9	70 - 130	129.8	19.8	30	
Surr: 1,2-Dichloroethane-d4	*45.65*	*0*	*48*	*0*	*95.1*	*70 - 126*	*44.43*	*2.72*	*30*	
Surr: 4-Bromofluorobenzene	*46.55*	*0*	*48*	*0*	*97.0*	*70 - 130*	*47.23*	*1.45*	*30*	
Surr: Dibromofluoromethane	*48.59*	*0*	*48*	*0*	*101*	*70 - 130*	*46.9*	*3.54*	*30*	
Surr: Toluene-d8	*48.64*	*0*	*48*	*0*	*101*	*70 - 130*	*48.33*	*0.631*	*30*	

The following samples were analyzed in this batch: HS20020445-01 HS20020445-02 HS20020445-03 HS20020445-04 HS20020445-05 HS20020445-06

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020445

QC BATCH REPORT

Batch ID: **R356458 (0)** **Instrument:** **Balance1** **Method:** **MOISTURE - ASTM D2216**

DUP Sample ID: **HS20020445-06DUP** Units: **wt%** Analysis Date: **17-Feb-2020 10:26**
Client ID: **SO-1620-SG02(5.5-6) 20200210** Run ID: **Balance1_356458** SeqNo: **5476887** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Percent Moisture	22.2	0.0100					23.8	6.96	20	

The following samples were analyzed in this batch: HS20020445-01 HS20020445-02 HS20020445-03 HS20020445-04 HS20020445-05 HS20020445-06

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: **HS20020445**

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/Kg-dry	Milligrams per Kilogram- Dry weight corrected

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231 V009	22-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Work Order: HS20020445

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS20020445-01	SO-1620-SG05(0.5-1) 20200210	Login	2/11/2020 3:58:43 PM	NDR	SPA207
HS20020445-01	SO-1620-SG05(0.5-1) 20200210	Login	2/11/2020 3:58:43 PM	NDR	J036
HS20020445-02	SO-1620-SG05(5.5-6) 20200210	Login	2/11/2020 3:58:43 PM	NDR	SPA207
HS20020445-02	SO-1620-SG05(5.5-6) 20200210	Login	2/11/2020 3:58:43 PM	NDR	J036
HS20020445-03	SO-1620-SG04(0.5-1) 20200210	Login	2/11/2020 3:58:43 PM	NDR	SPA207
HS20020445-03	SO-1620-SG04(0.5-1) 20200210	Login	2/11/2020 3:58:43 PM	NDR	J036
HS20020445-04	SO-1620-SG04(5.5-6) 20200210	Login	2/11/2020 3:58:43 PM	NDR	SPA207
HS20020445-04	SO-1620-SG04(5.5-6) 20200210	Login	2/11/2020 3:58:43 PM	NDR	J036

Sample Receipt Checklist

Client Name: PBW
Work Order: HS20020445

Date/Time Received: **11-Feb-2020 13:15**
Received by: **DDG**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 11-Feb-2020 Date

Reviewed by: *Corey Grandits* eSignature — 11-Feb-2020 Date

Matrices: **Soil**

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 ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:214096
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):	1.8C UC/C	IR # 25
Cooler(s)/Kit(s):	43416	
Date/Time sample(s) sent to storage:	02/11/2020 17:00	

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: Sample Count differ COC= 5 Rec'd = 4

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 _____ of _____

COC ID: 214096

HS20020445

Golder Associates Inc.

Houston TX-Wood Preserving Works

Customer Information		Project Information		ALS Project Manager:	
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works	A	8260_S (5652652 B,E,X)
Work Order		Project Number	1620-11-Rev0 SR 92688	B	8270_LOW_S (5632532 SVOC - Naphthalene only)
Company Name	Golder Associates Inc.	Bill To Company	Union Pacific Railroad- A/P	C	MOIST_ASTM (5631931 Gen.Chem. MOIST%)
Send Report To	Eric Matzner	Invoice Attn	Accounts Payable	D	
Address	2201 Double Creek Drive Suite 4004	Address	1400 Douglas Street Stop 0750	E	
City/State/Zip	Round Rock, TX 78664	City/State/Zip	Omaha NE 681790750	F	
Phone	(512) 671-3434	Phone		G	
Fax	(512) 671-3446	Fax		H	
e-Mail Address	Eric_Matzner@golder.com	e-Mail Address		I	
				J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	SO-1620-SG05 (0.5-1) 20200210	2-10-20	0950	Soil	8,9	5	X	X	X								
2	SG05 (5.5-6) 20200210		1010														
3	SG04 (0.5-1)		1320														
4	SG04 (5.5-6)		1330														
5	SG02 (0.5-1)		1550														
6	SG02 (5.5-6)		1600														
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Anthony Pastel

Shipment Method:

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: 2-11-20 Time: 1200 Received by:

Relinquished by: Date: 2/11/20 Time: 1315 Received by (Laboratory):

Logged by (Laboratory): Date: Time: Checked by (Laboratory):

Notes: UPRR HWPW 1620-11

Cooler ID	Cooler Temp.
U3416	1.3

QC Package: (Check One Box Below)

- [ ] Level II Std QC
- [ ] Level III Std QC/Raw Data
- [ ] 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

ote:
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.

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

February 24, 2020

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

Work Order: **HS20020506**

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

Dear Eric,

ALS Environmental received 7 sample(s) on Feb 12, 2020 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,

Generated By: DANE.WACASEY
Dane J. Wacasey

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Work Order: HS20020506

CASE NARRATIVE

Work Order Comments

- This report was revised February 24, 2020 in order to adjust sample collection date for the field duplicate sample from 2/11/2020 to 2/12/2020.

Client:	Golder Associates Inc.	**TRRP Laboratory Data Package Cover Page**
Project:	Houston TX-Wood Preserving Works	
WorkOrder:	**HS20020506**	

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.
Project:	Houston TX-Wood Preserving Works
WorkOrder:	**HS20020506**

TRRP Laboratory Data Package Cover Page

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: 02/19/2020					
Project Name: Houston TX-Wood Preserving Works			Laboratory Job Number: HS20020506					
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 150608, 150621, R356340, R356342, R356347, R356526					
#[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				
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				1
		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: 02/19/2020				
Project Name: Houston TX-Wood Preserving Works			Laboratory Job Number: HS20020506				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 150608, 150621, R356340, R356342, R356347, R356526				
#[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: 02/19/2020
Project Name: Houston TX-Wood Preserving Works		Laboratory Job Number: HS20020506
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 150608, 150621, R356340, R356342, R356347, R356526
ER#[5]	**Description**	
1	Batch 150621, Semivolatiles by Method SW8270, Sample SO-1620-FD01-20200212: Internal standard Perylene-d12 shifted due to possible matrix effect. There are no target analytes associated with compound.	

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
Work Order: HS20020506

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20020506-01	SO-1620-SG01(0.5-1)-20200211	Soil		11-Feb-2020 11:50	12-Feb-2020 15:40	☐
HS20020506-02	SO-1620-SG01(5.5-6)-20200211	Soil		11-Feb-2020 12:10	12-Feb-2020 15:40	☐
HS20020506-03	SO-1620-SG20(0.5-1)-20200211	Soil		11-Feb-2020 15:00	12-Feb-2020 15:40	☐
HS20020506-04	SO-1620-SG20(5.5-6)-20200211	Soil		11-Feb-2020 15:20	12-Feb-2020 15:40	☐
HS20020506-05	SO-1620-SG19(0.5-1)-20200212	Soil		12-Feb-2020 11:20	12-Feb-2020 15:40	☐
HS20020506-06	SO-1620-SG19(5.5-6)-20200212	Soil		12-Feb-2020 11:35	12-Feb-2020 15:40	☐
HS20020506-07	SO-1620-FD01-20200212	Soil		12-Feb-2020 00:00	12-Feb-2020 15:40	☐

Revision:1

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG01(0.5-1)-20200211
Collection Date: 11-Feb-2020 11:50

ANALYTICAL REPORT
WorkOrder:HS20020506
Lab ID:HS20020506-01
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00059	0.0059	mg/Kg-dry	1	15-Feb-2020 14:47
Ethylbenzene		U	0.00082	0.0059	mg/Kg-dry	1	15-Feb-2020 14:47
Xylenes, Total		U	0.0012	0.0059	mg/Kg-dry	1	15-Feb-2020 14:47
Surr: 1,2-Dichloroethane-d4	*82.9*			*70-126*	*%REC*	*1*	*15-Feb-2020 14:47*
Surr: 4-Bromofluorobenzene	*95.2*			*70-130*	*%REC*	*1*	*15-Feb-2020 14:47*
Surr: Dibromofluoromethane	*91.5*			*70-130*	*%REC*	*1*	*15-Feb-2020 14:47*
Surr: Toluene-d8	*103*			*70-130*	*%REC*	*1*	*15-Feb-2020 14:47*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 13-Feb-2020		Analyst: LG
Naphthalene		U	0.00070	0.0038	mg/Kg-dry	1	17-Feb-2020 17:34
Surr: 2-Fluorobiphenyl	*62.7*			*43-125*	*%REC*	*1*	*17-Feb-2020 17:34*
Surr: 4-Terphenyl-d14	*62.4*			*32-125*	*%REC*	*1*	*17-Feb-2020 17:34*
Surr: Nitrobenzene-d5	*41.5*			*37-125*	*%REC*	*1*	*17-Feb-2020 17:34*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**14.7**		**0.0100**	**0.0100**	**wt%**	1	18-Feb-2020 09:20

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

Revision: 1

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG01(5.5-6)-20200211
Collection Date: 11-Feb-2020 12:10

ANALYTICAL REPORT
WorkOrder:HS20020506
Lab ID:HS20020506-02
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00082	0.0082	mg/Kg-dry	1	15-Feb-2020 15:12
Ethylbenzene		U	0.0011	0.0082	mg/Kg-dry	1	15-Feb-2020 15:12
Xylenes, Total		U	0.0016	0.0082	mg/Kg-dry	1	15-Feb-2020 15:12
Surr: 1,2-Dichloroethane-d4	*82.9*			*70-126*	*%REC*	*1*	*15-Feb-2020 15:12*
Surr: 4-Bromofluorobenzene	*96.0*			*70-130*	*%REC*	*1*	*15-Feb-2020 15:12*
Surr: Dibromofluoromethane	*91.0*			*70-130*	*%REC*	*1*	*15-Feb-2020 15:12*
Surr: Toluene-d8	*103*			*70-130*	*%REC*	*1*	*15-Feb-2020 15:12*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 13-Feb-2020		Analyst: LG
Naphthalene		U	0.00073	0.0040	mg/Kg-dry	1	17-Feb-2020 17:53
Surr: 2-Fluorobiphenyl	*92.9*			*43-125*	*%REC*	*1*	*17-Feb-2020 17:53*
Surr: 4-Terphenyl-d14	*80.1*			*32-125*	*%REC*	*1*	*17-Feb-2020 17:53*
Surr: Nitrobenzene-d5	*63.7*			*37-125*	*%REC*	*1*	*17-Feb-2020 17:53*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**17.8**		**0.0100**	**0.0100**	**wt%**	1	18-Feb-2020 09:20

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG20(0.5-1)-20200211
Collection Date: 11-Feb-2020 15:00

ANALYTICAL REPORT
WorkOrder:HS20020506
Lab ID:HS20020506-03
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00080	0.0080	mg/Kg-dry	1	15-Feb-2020 15:36
Ethylbenzene		U	0.0011	0.0080	mg/Kg-dry	1	15-Feb-2020 15:36
Xylenes, Total		U	0.0016	0.0080	mg/Kg-dry	1	15-Feb-2020 15:36
Surr: 1,2-Dichloroethane-d4	*83.8*			*70-126*	*%REC*	*1*	*15-Feb-2020 15:36*
Surr: 4-Bromofluorobenzene	*94.2*			*70-130*	*%REC*	*1*	*15-Feb-2020 15:36*
Surr: Dibromofluoromethane	*91.1*			*70-130*	*%REC*	*1*	*15-Feb-2020 15:36*
Surr: Toluene-d8	*102*			*70-130*	*%REC*	*1*	*15-Feb-2020 15:36*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 13-Feb-2020		Analyst: LG
Naphthalene		U	0.00069	0.0038	mg/Kg-dry	1	17-Feb-2020 18:12
Surr: 2-Fluorobiphenyl	*72.9*			*43-125*	*%REC*	*1*	*17-Feb-2020 18:12*
Surr: 4-Terphenyl-d14	*81.7*			*32-125*	*%REC*	*1*	*17-Feb-2020 18:12*
Surr: Nitrobenzene-d5	*58.8*			*37-125*	*%REC*	*1*	*17-Feb-2020 18:12*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**12.8**		**0.0100**	**0.0100**	**wt%**	1	18-Feb-2020 09:20

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG20(5.5-6)-20200211
Collection Date: 11-Feb-2020 15:20

ANALYTICAL REPORT
WorkOrder:HS20020506
Lab ID:HS20020506-04
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00072	0.0072	mg/Kg-dry	1	15-Feb-2020 13:41
Ethylbenzene		U	0.0010	0.0072	mg/Kg-dry	1	15-Feb-2020 13:41
Xylenes, Total		U	0.0014	0.0072	mg/Kg-dry	1	15-Feb-2020 13:41
Surr: 1,2-Dichloroethane-d4	*81.5*			*70-126*	*%REC*	*1*	*15-Feb-2020 13:41*
Surr: 4-Bromofluorobenzene	*94.9*			*70-130*	*%REC*	*1*	*15-Feb-2020 13:41*
Surr: Dibromofluoromethane	*89.2*			*70-130*	*%REC*	*1*	*15-Feb-2020 13:41*
Surr: Toluene-d8	*105*			*70-130*	*%REC*	*1*	*15-Feb-2020 13:41*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 13-Feb-2020		Analyst: LG
Naphthalene		U	0.00071	0.0039	mg/Kg-dry	1	17-Feb-2020 18:31
Surr: 2-Fluorobiphenyl	*87.8*			*43-125*	*%REC*	*1*	*17-Feb-2020 18:31*
Surr: 4-Terphenyl-d14	*83.9*			*32-125*	*%REC*	*1*	*17-Feb-2020 18:31*
Surr: Nitrobenzene-d5	*59.3*			*37-125*	*%REC*	*1*	*17-Feb-2020 18:31*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**16.8**		**0.0100**	**0.0100**	**wt%**	1	18-Feb-2020 09:20

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG19(0.5-1)-20200212
Collection Date: 12-Feb-2020 11:20

ANALYTICAL REPORT
WorkOrder:HS20020506
Lab ID:HS20020506-05
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00059	0.0059	mg/Kg-dry	1	17-Feb-2020 10:14
Ethylbenzene		U	0.00082	0.0059	mg/Kg-dry	1	17-Feb-2020 10:14
Xylenes, Total		U	0.0012	0.0059	mg/Kg-dry	1	17-Feb-2020 10:14
Surr: 1,2-Dichloroethane-d4	*81.6*			*70-126*	*%REC*	*1*	*17-Feb-2020 10:14*
Surr: 4-Bromofluorobenzene	*90.1*			*70-130*	*%REC*	*1*	*17-Feb-2020 10:14*
Surr: Dibromofluoromethane	*92.9*			*70-130*	*%REC*	*1*	*17-Feb-2020 10:14*
Surr: Toluene-d8	*100*			*70-130*	*%REC*	*1*	*17-Feb-2020 10:14*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 13-Feb-2020		Analyst: LG
Naphthalene		U	0.00069	0.0038	mg/Kg-dry	1	17-Feb-2020 18:50
Surr: 2-Fluorobiphenyl	*75.2*			*43-125*	*%REC*	*1*	*17-Feb-2020 18:50*
Surr: 4-Terphenyl-d14	*90.7*			*32-125*	*%REC*	*1*	*17-Feb-2020 18:50*
Surr: Nitrobenzene-d5	*67.0*			*37-125*	*%REC*	*1*	*17-Feb-2020 18:50*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**14.1**		**0.0100**	**0.0100**	**wt%**	1	18-Feb-2020 09:20

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG19(5.5-6)-20200212
Collection Date: 12-Feb-2020 11:35

ANALYTICAL REPORT
WorkOrder:HS20020506
Lab ID:HS20020506-06
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00062	0.0062	mg/Kg-dry	1	15-Feb-2020 14:27
Ethylbenzene		U	0.00087	0.0062	mg/Kg-dry	1	15-Feb-2020 14:27
Xylenes, Total		U	0.0012	0.0062	mg/Kg-dry	1	15-Feb-2020 14:27
Surr: 1,2-Dichloroethane-d4	*81.7*			*70-126*	*%REC*	*1*	*15-Feb-2020 14:27*
Surr: 4-Bromofluorobenzene	*96.8*			*70-130*	*%REC*	*1*	*15-Feb-2020 14:27*
Surr: Dibromofluoromethane	*89.3*			*70-130*	*%REC*	*1*	*15-Feb-2020 14:27*
Surr: Toluene-d8	*108*			*70-130*	*%REC*	*1*	*15-Feb-2020 14:27*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 13-Feb-2020		Analyst: LG
Naphthalene		U	0.00071	0.0039	mg/Kg-dry	1	17-Feb-2020 19:10
Surr: 2-Fluorobiphenyl	*51.8*			*43-125*	*%REC*	*1*	*17-Feb-2020 19:10*
Surr: 4-Terphenyl-d14	*65.3*			*32-125*	*%REC*	*1*	*17-Feb-2020 19:10*
Surr: Nitrobenzene-d5	*43.9*			*37-125*	*%REC*	*1*	*17-Feb-2020 19:10*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**15.1**		**0.0100**	**0.0100**	**wt%**	1	18-Feb-2020 09:20

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

Revision: 1

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-FD01-20200212
Collection Date: 12-Feb-2020 00:00

ANALYTICAL REPORT
WorkOrder:HS20020506
Lab ID:HS20020506-07
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00060	0.0060	mg/Kg-dry	1	15-Feb-2020 14:49
Ethylbenzene		U	0.00083	0.0060	mg/Kg-dry	1	15-Feb-2020 14:49
Xylenes, Total		U	0.0012	0.0060	mg/Kg-dry	1	15-Feb-2020 14:49
Surr: 1,2-Dichloroethane-d4	*86.9*			*70-126*	*%REC*	*1*	*15-Feb-2020 14:49*
Surr: 4-Bromofluorobenzene	*92.6*			*70-130*	*%REC*	*1*	*15-Feb-2020 14:49*
Surr: Dibromofluoromethane	*91.9*			*70-130*	*%REC*	*1*	*15-Feb-2020 14:49*
Surr: Toluene-d8	*105*			*70-130*	*%REC*	*1*	*15-Feb-2020 14:49*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 13-Feb-2020		Analyst: GEY
Naphthalene	**0.0053**		**0.00071**	**0.0039**	**mg/Kg-dry**	1	14-Feb-2020 20:22
Surr: 2-Fluorobiphenyl	*76.4*			*43-125*	*%REC*	*1*	*14-Feb-2020 20:22*
Surr: 4-Terphenyl-d14	*98.9*			*32-125*	*%REC*	*1*	*14-Feb-2020 20:22*
Surr: Nitrobenzene-d5	*71.3*			*37-125*	*%REC*	*1*	*14-Feb-2020 20:22*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**15.3**		**0.0100**	**0.0100**	**wt%**	1	18-Feb-2020 09:20

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

Weight / Prep Log

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020506

Batch ID: 3612 **Start Date:** 13 Feb 2020 14:50 **End Date:** 13 Feb 2020 14:50
Method: VOLATILES BY SW8260C

Sample ID	Container	Sample Wt/Vol	Final Volume	Weight Factor	Container Type
HS20020506-01	1	4.978 (g)	5 (mL)	1	TerraCore (5035A)
HS20020506-02	1	3.722 (g)	5 (mL)	1.34	TerraCore (5035A)
HS20020506-03	1	3.579 (g)	5 (mL)	1.4	TerraCore (5035A)
HS20020506-04	1	4.215 (g)	5 (mL)	1.19	TerraCore (5035A)
HS20020506-05	1	4.974 (g)	5 (mL)	1.01	TerraCore (5035A)
HS20020506-06	1	4.771 (g)	5 (mL)	1.05	TerraCore (5035A)
HS20020506-07	1	4.955 (g)	5 (mL)	1.01	TerraCore (5035A)

Batch ID: 150608 **Start Date:** 13 Feb 2020 13:39 **End Date:** 13 Feb 2020 18:00
Method: SV SOXHLET EXTRACT-LOWLEVEL-SW3541 **Prep Code:** 3541_B_LOW

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20020506-01		30.35 (g)	1 (mL)	0.03295
HS20020506-02		30.14 (g)	1 (mL)	0.03318
HS20020506-03		30.1 (g)	1 (mL)	0.03322
HS20020506-04		30.27 (g)	1 (mL)	0.03304
HS20020506-05		30.16 (g)	1 (mL)	0.03316
HS20020506-06		30.02 (g)	1 (mL)	0.03331

Batch ID: 150621 **Start Date:** 13 Feb 2020 16:41 **End Date:** 13 Feb 2020 20:00
Method: SV SOXHLET EXTRACT-LOWLEVEL-SW3541 **Prep Code:** 3541_B_LOW

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20020506-07		30 (g)	1 (mL)	0.03333

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020506

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 150608 (0)	**Test Name :** LOW-LEVEL SEMIVOLATILES BY 8270D				**Matrix:** Soil	
HS20020506-01	SO-1620-SG01(0.5-1)-20200211	11 Feb 2020 11:50		13 Feb 2020 13:39	17 Feb 2020 17:34	1
HS20020506-02	SO-1620-SG01(5.5-6)-20200211	11 Feb 2020 12:10		13 Feb 2020 13:39	17 Feb 2020 17:53	1
HS20020506-03	SO-1620-SG20(0.5-1)-20200211	11 Feb 2020 15:00		13 Feb 2020 13:39	17 Feb 2020 18:12	1
HS20020506-04	SO-1620-SG20(5.5-6)-20200211	11 Feb 2020 15:20		13 Feb 2020 13:39	17 Feb 2020 18:31	1
HS20020506-05	SO-1620-SG19(0.5-1)-20200212	12 Feb 2020 11:20		13 Feb 2020 13:39	17 Feb 2020 18:50	1
HS20020506-06	SO-1620-SG19(5.5-6)-20200212	12 Feb 2020 11:35		13 Feb 2020 13:39	17 Feb 2020 19:10	1
Batch ID: 150621 (0)	**Test Name :** LOW-LEVEL SEMIVOLATILES BY 8270D				**Matrix:** Soil	
HS20020506-07	SO-1620-FD01-20200212	12 Feb 2020 00:00		13 Feb 2020 16:41	14 Feb 2020 20:22	1
Batch ID: R356340 (0)	**Test Name :** VOLATILES BY SW8260C				**Matrix:** Soil	
HS20020506-04	SO-1620-SG20(5.5-6)-20200211	11 Feb 2020 15:20			15 Feb 2020 13:41	1
HS20020506-06	SO-1620-SG19(5.5-6)-20200212	12 Feb 2020 11:35			15 Feb 2020 14:27	1
HS20020506-07	SO-1620-FD01-20200212	12 Feb 2020 00:00			15 Feb 2020 14:49	1
Batch ID: R356342 (0)	**Test Name :** VOLATILES BY SW8260C				**Matrix:** Soil	
HS20020506-01	SO-1620-SG01(0.5-1)-20200211	11 Feb 2020 11:50			15 Feb 2020 14:47	1
HS20020506-02	SO-1620-SG01(5.5-6)-20200211	11 Feb 2020 12:10			15 Feb 2020 15:12	1
HS20020506-03	SO-1620-SG20(0.5-1)-20200211	11 Feb 2020 15:00			15 Feb 2020 15:36	1
Batch ID: R356347 (0)	**Test Name :** VOLATILES BY SW8260C				**Matrix:** Soil	
HS20020506-05	SO-1620-SG19(0.5-1)-20200212	12 Feb 2020 11:20			17 Feb 2020 10:14	1
Batch ID: R356526 (0)	**Test Name :** MOISTURE - ASTM D2216				**Matrix:** Soil	
HS20020506-01	SO-1620-SG01(0.5-1)-20200211	11 Feb 2020 11:50			18 Feb 2020 09:20	1
HS20020506-02	SO-1620-SG01(5.5-6)-20200211	11 Feb 2020 12:10			18 Feb 2020 09:20	1
HS20020506-03	SO-1620-SG20(0.5-1)-20200211	11 Feb 2020 15:00			18 Feb 2020 09:20	1
HS20020506-04	SO-1620-SG20(5.5-6)-20200211	11 Feb 2020 15:20			18 Feb 2020 09:20	1
HS20020506-05	SO-1620-SG19(0.5-1)-20200212	12 Feb 2020 11:20			18 Feb 2020 09:20	1
HS20020506-06	SO-1620-SG19(5.5-6)-20200212	12 Feb 2020 11:35			18 Feb 2020 09:20	1
HS20020506-07	SO-1620-FD01-20200212	12 Feb 2020 00:00			18 Feb 2020 09:20	1

Revision: 1

WorkOrder: HS20020506
InstrumentID: SV-6
Test Code: 8270_LOW_S
Test Number: SW8270
Test Name: Low-Level Semivolatiles by 8270D

METHOD DETECTION / REPORTING LIMITS

Matrix: Solid **Units:** mg/Kg

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Naphthalene	91-20-3	0.0017	0.0019	0.00060	0.0033
S	2-Fluorobiphenyl	321-60-8	0	0	0	0
S	4-Terphenyl-d14	1718-51-0	0	0	0	0
S	Nitrobenzene-d5	4165-60-0	0	0	0	0

Revision:1

WorkOrder: HS20020506
InstrumentID: SV-7
Test Code: 8270_LOW_S
Test Number: SW8270
Test Name: Low-Level Semivolatiles by 8270D

METHOD DETECTION / REPORTING LIMITS

Matrix: Solid **Units:** mg/Kg

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Naphthalene	91-20-3	0.0017	0.0018	0.00060	0.0033
S	2-Fluorobiphenyl	321-60-8	0	0	0	0
S	4-Terphenyl-d14	1718-51-0	0	0	0	0
S	Nitrobenzene-d5	4165-60-0	0	0	0	0

Revision:1

WorkOrder: HS20020506
InstrumentID: VOA5
Test Code: 8260_S
Test Number: SW8260
Test Name: Volatiles by SW8260C

METHOD DETECTION / REPORTING LIMITS

Matrix: Solid **Units:** mg/Kg

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Benzene	71-43-2	0.0012	0.0016	0.00050	0.0050
A	Ethylbenzene	100-41-4	0.0012	0.0016	0.00070	0.0050
A	Xylenes, Total	1330-20-7	0.0012	0.0016	0.0010	0.0050
S	1,2-Dichloroethane-d4	17060-07-0	0	0	0	0
S	4-Bromofluorobenzene	460-00-4	0	0	0	0
S	Dibromofluoromethane	1868-53-7	0	0	0	0
S	Toluene-d8	2037-26-5	0	0	0	0

Revision:1

WorkOrder: HS20020506
InstrumentID: VOA8
Test Code: 8260_S
Test Number: SW8260
Test Name: Volatiles by SW8260C

METHOD DETECTION / REPORTING LIMITS

Matrix: Solid **Units:** mg/Kg

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Benzene	71-43-2	0.0012	0.0013	0.00050	0.0050
A	Ethylbenzene	100-41-4	0.0012	0.0014	0.00070	0.0050
A	Xylenes, Total	1330-20-7	0.0012	0.0014	0.0010	0.0050
S	1,2-Dichloroethane-d4	17060-07-0	0	0	0	0
S	4-Bromofluorobenzene	460-00-4	0	0	0	0
S	Dibromofluoromethane	1868-53-7	0	0	0	0
S	Toluene-d8	2037-26-5	0	0	0	0

Revision:1

WorkOrder: HS20020506
InstrumentID: Balance1
Test Code: MOIST_ASTM
Test Number: ASTM D2216
Test Name: Moisture - ASTM D2216

METHOD DETECTION / REPORTING LIMITS

Matrix: Solid **Units:** wt%

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Percent Moisture	MOIST	0.0100	0.0100	0.0100	0.0100

Revision:1

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020506

QC BATCH REPORT

Batch ID: 150608 (0) **Instrument: SV-6** **Method: LOW-LEVEL SEMIVOLATILES BY 8270D**

MBLK Sample ID: **MBLK-150608** Units: **ug/Kg** Analysis Date: **13-Feb-2020 17:29**
Client ID: Run ID: **SV-6_356229** SeqNo: **5472906** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	U	3.3								
Surr: 2-Fluorobiphenyl	*127.4*	*0*	*167*	*0*	*76.3*	*43 - 125*				
Surr: 4-Terphenyl-d14	*123.1*	*0*	*167*	*0*	*73.7*	*32 - 125*				
Surr: Nitrobenzene-d5	*118.2*	*0*	*167*	*0*	*70.8*	*37 - 125*				

LCS Sample ID: **LCS-150608** Units: **ug/Kg** Analysis Date: **13-Feb-2020 17:48**
Client ID: Run ID: **SV-6_356229** SeqNo: **5472907** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	133.9	3.3	167	0	80.2	50 - 125				
Surr: 2-Fluorobiphenyl	*139.8*	*0*	*167*	*0*	*83.7*	*43 - 125*				
Surr: 4-Terphenyl-d14	*142.8*	*0*	*167*	*0*	*85.5*	*32 - 125*				
Surr: Nitrobenzene-d5	*127.2*	*0*	*167*	*0*	*76.2*	*37 - 125*				

MS Sample ID: **HS20020449-01MS** Units: **ug/Kg** Analysis Date: **14-Feb-2020 11:51**
Client ID: Run ID: **SV-6_356287** SeqNo: **5473656** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	116.6	3.3	166.7	0	70.0	50 - 125				
Surr: 2-Fluorobiphenyl	*127.2*	*0*	*166.7*	*0*	*76.3*	*43 - 125*				
Surr: 4-Terphenyl-d14	*129.4*	*0*	*166.7*	*0*	*77.6*	*32 - 125*				
Surr: Nitrobenzene-d5	*107*	*0*	*166.7*	*0*	*64.2*	*37 - 125*				

MSD Sample ID: **HS20020449-01MSD** Units: **ug/Kg** Analysis Date: **14-Feb-2020 12:10**
Client ID: Run ID: **SV-6_356287** SeqNo: **5473657** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	115.5	3.3	165	0	70.0	50 - 125	116.6	0.905	30	
Surr: 2-Fluorobiphenyl	*124.1*	*0*	*165*	*0*	*75.2*	*43 - 125*	*127.2*	*2.46*	*30*	
Surr: 4-Terphenyl-d14	*118.8*	*0*	*165*	*0*	*72.0*	*32 - 125*	*129.4*	*8.49*	*30*	
Surr: Nitrobenzene-d5	*106.2*	*0*	*165*	*0*	*64.4*	*37 - 125*	*107*	*0.758*	*30*	

The following samples were analyzed in this batch: HS20020506-01 HS20020506-02 HS20020506-03 HS20020506-04 HS20020506-05 HS20020506-06

Revision: 1

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020506

QC BATCH REPORT

Batch ID: 150621 (0) **Instrument: SV-7** **Method: LOW-LEVEL SEMIVOLATILES BY 8270D**

MBLK Sample ID: **MBLK-150621** Units: **ug/Kg** Analysis Date: **14-Feb-2020 11:22**
Client ID: Run ID: **SV-7_356313** SeqNo: **5475049** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	U	3.3								
Surr: 2-Fluorobiphenyl	*108.8*	*0*	*167*	*0*	*65.1*	*43 - 125*				
Surr: 4-Terphenyl-d14	*120.7*	*0*	*167*	*0*	*72.3*	*32 - 125*				
Surr: Nitrobenzene-d5	*90.27*	*0*	*167*	*0*	*54.1*	*37 - 125*				

LCS Sample ID: **LCS-150621** Units: **ug/Kg** Analysis Date: **14-Feb-2020 11:41**
Client ID: Run ID: **SV-7_356313** SeqNo: **5475050** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	123	3.3	167	0	73.6	50 - 125				
Surr: 2-Fluorobiphenyl	*122*	*0*	*167*	*0*	*73.1*	*43 - 125*				
Surr: 4-Terphenyl-d14	*133.5*	*0*	*167*	*0*	*79.9*	*32 - 125*				
Surr: Nitrobenzene-d5	*108.7*	*0*	*167*	*0*	*65.1*	*37 - 125*				

MS Sample ID: **HS20020518-01MS** Units: **ug/Kg** Analysis Date: **14-Feb-2020 12:47**
Client ID: Run ID: **SV-7_356313** SeqNo: **5475052** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	117.8	3.3	167	0.6599	70.2	50 - 125				
Surr: 2-Fluorobiphenyl	*110.4*	*0*	*167*	*0*	*66.1*	*43 - 125*				
Surr: 4-Terphenyl-d14	*130.2*	*0*	*167*	*0*	*78.0*	*32 - 125*				
Surr: Nitrobenzene-d5	*89.84*	*0*	*167*	*0*	*53.8*	*37 - 125*				

MSD Sample ID: **HS20020518-01MSD** Units: **ug/Kg** Analysis Date: **18-Feb-2020 00:44**
Client ID: Run ID: **SV-7_356439** SeqNo: **5476514** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	120.3	3.3	167	0.6599	71.6	50 - 125	117.8	2.08	30	
Surr: 2-Fluorobiphenyl	*108.4*	*0*	*167*	*0*	*64.9*	*43 - 125*	*110.4*	*1.8*	*30*	
Surr: 4-Terphenyl-d14	*126.5*	*0*	*167*	*0*	*75.8*	*32 - 125*	*130.2*	*2.89*	*30*	
Surr: Nitrobenzene-d5	*97.75*	*0*	*167*	*0*	*58.5*	*37 - 125*	*89.84*	*8.43*	*30*	

The following samples were analyzed in this batch: HS20020506-07

Revision: 1

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020506

QC BATCH REPORT

Batch ID: R356340 (0) **Instrument: VOA8** **Method: VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKS1-021520** Units: **ug/Kg** Analysis Date: **15-Feb-2020 10:37**
Client ID: Run ID: **VOA8_356340** SeqNo: **5474381** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	5.0								
Ethylbenzene	U	5.0								
Xylenes, Total	U	5.0								
Surr: 1,2-Dichloroethane-d4	*38.39*	*0*	*50*	*0*	*76.8*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*47.41*	*0*	*50*	*0*	*94.8*	*80 - 120*				
Surr: Dibromofluoromethane	*41.87*	*0*	*50*	*0*	*83.7*	*80 - 119*				
Surr: Toluene-d8	*54.45*	*0*	*50*	*0*	*109*	*81 - 118*				

LCS Sample ID: **VLCSS1-021520** Units: **ug/Kg** Analysis Date: **15-Feb-2020 09:52**
Client ID: Run ID: **VOA8_356340** SeqNo: **5474380** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	49.89	5.0	50	0	99.8	75 - 124				
Ethylbenzene	54.19	5.0	50	0	108	70 - 123				
Xylenes, Total	157.2	5.0	150	0	105	77 - 128				
Surr: 1,2-Dichloroethane-d4	*40.31*	*0*	*50*	*0*	*80.6*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*47.65*	*0*	*50*	*0*	*95.3*	*80 - 120*				
Surr: Dibromofluoromethane	*45.8*	*0*	*50*	*0*	*91.6*	*80 - 119*				
Surr: Toluene-d8	*52.33*	*0*	*50*	*0*	*105*	*81 - 118*				

MS Sample ID: **HS20020334-01MS** Units: **ug/Kg** Analysis Date: **15-Feb-2020 19:24**
Client ID: Run ID: **VOA8_356340** SeqNo: **5474402** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	51.68	5.0	49.5	0	104	70 - 130				
Ethylbenzene	51.59	5.0	49.5	0	104	70 - 130				
Xylenes, Total	152.9	5.0	148.5	0	103	70 - 130				
Surr: 1,2-Dichloroethane-d4	*47.55*	*0*	*49.5*	*0*	*96.1*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*50.16*	*0*	*49.5*	*0*	*101*	*70 - 130*				
Surr: Dibromofluoromethane	*49.39*	*0*	*49.5*	*0*	*99.8*	*70 - 130*				
Surr: Toluene-d8	*49.98*	*0*	*49.5*	*0*	*101*	*70 - 130*				

Revision: 1

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020506

QC BATCH REPORT

Batch ID: R356340 (0) **Instrument: VOA8** **Method: VOLATILES BY SW8260C**

MSD Sample ID: **HS20020334-01MSD** Units: **ug/Kg** Analysis Date: **15-Feb-2020 11:46**
Client ID: Run ID: **VOA8_356340** SeqNo: **5474383** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Benzene	49.35	5.0	50	0	98.7	70 - 130	51.68	4.61	30	
Ethylbenzene	50.79	5.0	50	0	102	70 - 130	51.59	1.58	30	
Xylenes, Total	148.4	5.0	150	0	99.0	70 - 130	152.9	2.96	30	
Surr: 1,2-Dichloroethane-d4	*44.94*	*0*	*50*	*0*	*89.9*	*70 - 126*	*47.55*	*5.64*	*30*	
Surr: 4-Bromofluorobenzene	*49.81*	*0*	*50*	*0*	*99.6*	*70 - 130*	*50.16*	*0.696*	*30*	
Surr: Dibromofluoromethane	*48.83*	*0*	*50*	*0*	*97.7*	*70 - 130*	*49.39*	*1.15*	*30*	
Surr: Toluene-d8	*51.03*	*0*	*50*	*0*	*102*	*70 - 130*	*49.98*	*2.08*	*30*	

The following samples were analyzed in this batch: HS20020506-04 HS20020506-06 HS20020506-07

Revision: 1

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020506

QC BATCH REPORT

Batch ID: R356342 (0) **Instrument: VOA5** **Method: VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKS1-021520** Units: **ug/Kg** Analysis Date: **15-Feb-2020 10:38**
Client ID: Run ID: **VOA5_356342** SeqNo: **5474460** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	5.0								
Ethylbenzene	U	5.0								
Xylenes, Total	U	5.0								
Surr: 1,2-Dichloroethane-d4	*45.4*	*0*	*50*	*0*	*90.8*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*47.6*	*0*	*50*	*0*	*95.2*	*80 - 120*				
Surr: Dibromofluoromethane	*46.63*	*0*	*50*	*0*	*93.3*	*80 - 119*				
Surr: Toluene-d8	*49.33*	*0*	*50*	*0*	*98.7*	*81 - 118*				

LCS Sample ID: **VLCSS1-021520** Units: **ug/Kg** Analysis Date: **15-Feb-2020 09:48**
Client ID: Run ID: **VOA5_356342** SeqNo: **5474459** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	53.58	5.0	50	0	107	75 - 124				
Ethylbenzene	54.61	5.0	50	0	109	70 - 123				
Xylenes, Total	164.4	5.0	150	0	110	77 - 128				
Surr: 1,2-Dichloroethane-d4	*47.23*	*0*	*50*	*0*	*94.5*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*48.41*	*0*	*50*	*0*	*96.8*	*80 - 120*				
Surr: Dibromofluoromethane	*50.12*	*0*	*50*	*0*	*100*	*80 - 119*				
Surr: Toluene-d8	*49.87*	*0*	*50*	*0*	*99.7*	*81 - 118*				

MS Sample ID: **HS20020288-10MS** Units: **ug/Kg** Analysis Date: **15-Feb-2020 11:28**
Client ID: Run ID: **VOA5_356342** SeqNo: **5474462** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	45.6	4.8	48	0	95.0	70 - 130				
Ethylbenzene	42.51	4.8	48	0	88.6	70 - 130				
Xylenes, Total	129.8	4.8	144	0	90.1	70 - 130				
Surr: 1,2-Dichloroethane-d4	*44.43*	*0*	*48*	*0*	*92.6*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*47.23*	*0*	*48*	*0*	*98.4*	*70 - 130*				
Surr: Dibromofluoromethane	*46.9*	*0*	*48*	*0*	*97.7*	*70 - 130*				
Surr: Toluene-d8	*48.33*	*0*	*48*	*0*	*101*	*70 - 130*				

Revision: 1

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020506

QC BATCH REPORT

Batch ID: R356342 (0) **Instrument: VOA5** **Method: VOLATILES BY SW8260C**

MSD Sample ID: **HS20020288-10MSD** Units: **ug/Kg** Analysis Date: **15-Feb-2020 11:53**
Client ID: Run ID: **VOA5_356342** SeqNo: **5474463** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	37.07	4.8	48	0	77.2	70 - 130	45.6	20.6	30	
Ethylbenzene	35.46	4.8	48	0	73.9	70 - 130	42.51	18.1	30	
Xylenes, Total	106.4	4.8	144	0	73.9	70 - 130	129.8	19.8	30	
Surr: 1,2-Dichloroethane-d4	*45.65*	*0*	*48*	*0*	*95.1*	*70 - 126*	*44.43*	*2.72*	*30*	
Surr: 4-Bromofluorobenzene	*46.55*	*0*	*48*	*0*	*97.0*	*70 - 130*	*47.23*	*1.45*	*30*	
Surr: Dibromofluoromethane	*48.59*	*0*	*48*	*0*	*101*	*70 - 130*	*46.9*	*3.54*	*30*	
Surr: Toluene-d8	*48.64*	*0*	*48*	*0*	*101*	*70 - 130*	*48.33*	*0.631*	*30*	

The following samples were analyzed in this batch: HS20020506-01 HS20020506-02 HS20020506-03

Revision: 1

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020506

QC BATCH REPORT

Batch ID: R356347 (0) **Instrument: VOA5** **Method: VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKS1-021720** Units: **ug/Kg** Analysis Date: **17-Feb-2020 09:25**
Client ID: Run ID: **VOA5_356347** SeqNo: **5474687** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	5.0								
Ethylbenzene	U	5.0								
Xylenes, Total	U	5.0								
Surr: 1,2-Dichloroethane-d4	*43.64*	*0*	*50*	*0*	*87.3*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*46.48*	*0*	*50*	*0*	*93.0*	*80 - 120*				
Surr: Dibromofluoromethane	*47.05*	*0*	*50*	*0*	*94.1*	*80 - 119*				
Surr: Toluene-d8	*49.59*	*0*	*50*	*0*	*99.2*	*81 - 118*				

LCS Sample ID: **VLCSS1-021720** Units: **ug/Kg** Analysis Date: **17-Feb-2020 08:35**
Client ID: Run ID: **VOA5_356347** SeqNo: **5474686** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	55.18	5.0	50	0	110	75 - 124				
Ethylbenzene	55.2	5.0	50	0	110	70 - 123				
Xylenes, Total	166.1	5.0	150	0	111	77 - 128				
Surr: 1,2-Dichloroethane-d4	*46.03*	*0*	*50*	*0*	*92.1*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*47.82*	*0*	*50*	*0*	*95.6*	*80 - 120*				
Surr: Dibromofluoromethane	*50.21*	*0*	*50*	*0*	*100*	*80 - 119*				
Surr: Toluene-d8	*49.94*	*0*	*50*	*0*	*99.9*	*81 - 118*				

MS Sample ID: **HS20020533-09MS** Units: **ug/Kg** Analysis Date: **17-Feb-2020 11:29**
Client ID: Run ID: **VOA5_356347** SeqNo: **5475037** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	48.07	5.1	51	0	94.3	70 - 130				
Ethylbenzene	48.17	5.1	51	0	94.5	70 - 130				
Xylenes, Total	143.4	5.1	153	0	93.7	70 - 130				
Surr: 1,2-Dichloroethane-d4	*46.89*	*0*	*51*	*0*	*91.9*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*48.14*	*0*	*51*	*0*	*94.4*	*70 - 130*				
Surr: Dibromofluoromethane	*51.35*	*0*	*51*	*0*	*101*	*70 - 130*				
Surr: Toluene-d8	*51.16*	*0*	*51*	*0*	*100*	*70 - 130*				

Revision: 1

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020506

QC BATCH REPORT

Batch ID: R356347 (0) **Instrument: VOA5** **Method: VOLATILES BY SW8260C**

MSD Sample ID: **HS20020533-09MSD** Units: **ug/Kg** Analysis Date: **17-Feb-2020 11:54**
Client ID: Run ID: **VOA5_356347** SeqNo: **5475038** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Benzene	46.11	5.0	50	0	92.2	70 - 130	48.07	4.17	30	
Ethylbenzene	45.33	5.0	50	0	90.7	70 - 130	48.17	6.08	30	
Xylenes, Total	136.9	5.0	150	0	91.3	70 - 130	143.4	4.6	30	
Surr: 1,2-Dichloroethane-d4	*46.52*	*0*	*50*	*0*	*93.0*	*70 - 126*	*46.89*	*0.8*	*30*	
Surr: 4-Bromofluorobenzene	*47.95*	*0*	*50*	*0*	*95.9*	*70 - 130*	*48.14*	*0.404*	*30*	
Surr: Dibromofluoromethane	*50.78*	*0*	*50*	*0*	*102*	*70 - 130*	*51.35*	*1.12*	*30*	
Surr: Toluene-d8	*50.25*	*0*	*50*	*0*	*100*	*70 - 130*	*51.16*	*1.81*	*30*	

The following samples were analyzed in this batch: HS20020506-05

Revision: 1

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020506

QC BATCH REPORT

Batch ID: R356526 (0) **Instrument:** Balance1 **Method:** MOISTURE - ASTM D2216

DUP Sample ID: **HS20020571-06DUP** Units: **wt%** Analysis Date: **18-Feb-2020 09:20**
Client ID: Run ID: **Balance1_356526** SeqNo: **5478088** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Percent Moisture	15.1	0.0100					15.2	0.66	20	

The following samples were analyzed in this batch:

HS20020506-01	HS20020506-02	HS20020506-03	HS20020506-04
HS20020506-05	HS20020506-06	HS20020506-07	

Revision: 1

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: **HS20020506**

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/Kg-dry	Milligrams per Kilogram- Dry weight corrected

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231 V009	22-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

Sample Receipt Checklist

Client Name: PBW
Work Order: HS20020506

Date/Time Received: **12-Feb-2020 15:40**
Received by: **DDG**

Checklist completed by: *Paresh M. Giga* eSignature — 12-Feb-2020 Date

Reviewed by: *Dane J. Wacasey* eSignature — 13-Feb-2020 Date

Matrices: **Soil**

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 ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:214097
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):	0.9°C uc/c	IR25	
Cooler(s)/Kit(s):	45557		
Date/Time sample(s) sent to storage:	2/12/2020 18:25		
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:

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 _____ of _____

COC ID: 214097

HS20020506

Golder Associates Inc.
Houston TX-Wood Preserving Works

Customer Information		Project Information		ALS Project Manager:	
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works	A	8260_S (5652652 B,E,X)
Work Order		Project Number	1620-11-Rev0 SR 92688	B	8270_LOW_S (5632532 SVOC - Naphthalene only)
Company Name	Golder Associates Inc.	Bill To Company	Union Pacific Railroad- A/P	C	MOIST_ASTM (5631931 Gen.Chem. MOIST%)
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	SO-1620-SG01 (0.5-1) 20200211	2-11-20	1150	Soil	8,9	5	X	X	X								
2	SG01 (5.5-6) 20200211	"	1210	"	"	"	"	"	"								
3	SG20 (0.5-1) 20200211	"	1500	"	"	"	"	"	"								
4	SG20 (5.5-6) 20200211	"	1520	"	"	"	"	"	"								
5	SG19 (0.5-1) 20200212	2-12-20	1120	"	"	"	"	"	"								
6	SG19 (5.5-6) 20200212	"	1135	"	"	"	"	"	"								
7	Duplicate	—	—	"	"	"	X	X	X								
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Anthony Reid

Shipment Method:

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: 2-12-20	Time: 1400	Received by:	
Relinquished by:		Date: 2-12-20	Time: 1540	Received by (Laboratory):	
Logged by (Laboratory):		Date:	Time:	Checked by (Laboratory):	

Notes: UPRR HWPW 1620-11

Cooler ID	Cooler Temp.
45557	0.9

QC Package: (Check One Box Below)

- [ ] Level II Std QC
- [ ] Level III Std QC/Raw Data
- [ ] 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.

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
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February 20, 2020

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

Work Order: **HS20020571**

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

Dear Eric,

ALS Environmental received 6 sample(s) on Feb 13, 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	
WorkOrder:	**HS20020571**	

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.
Project:	Houston TX-Wood Preserving Works
WorkOrder:	**HS20020571**

TRRP Laboratory Data Package Cover Page

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: 02/20/2020				
Project Name: Houston TX-Wood Preserving Works			Laboratory Job Number: HS20020571				
Reviewer Name: Corey Grandits			Prep Batch Number(s): 150668,150728,R356419,R356526				
#[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				
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			1
		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: 02/20/2020				
Project Name: Houston TX-Wood Preserving Works			Laboratory Job Number: HS20020571				
Reviewer Name: Corey Grandits			Prep Batch Number(s): 150668,150728,R356419,R356526				
#[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: 02/20/2020
Project Name: Houston TX-Wood Preserving Works	Laboratory Job Number: HS20020571
Reviewer Name: Corey Grandits	Prep Batch Number(s): 150668,150728,R356419,R356526

ER#[5]	Description
1	Batch R354619, Volatile Organics Method SW8260, sample HS20020397-01, MS and MSD were performed on unrelated sample.

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
Work Order: HS20020571

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20020571-01	SO-1620-SG17(0.5-1)20200212	Soil		12-Feb-2020 15:40	13-Feb-2020 18:01	☐
HS20020571-02	SO-1620-SG17(5.5-6)20200212	Soil		12-Feb-2020 15:50	13-Feb-2020 18:01	☐
HS20020571-03	SO-1620-SG16(0.5-1)20200213	Soil		13-Feb-2020 12:15	13-Feb-2020 18:01	☐
HS20020571-04	SO-1620-SG16(5.5-6)20200213	Soil		13-Feb-2020 12:30	13-Feb-2020 18:01	☐
HS20020571-05	SO-1620-SG15(0.5-1)20200213	Soil		13-Feb-2020 14:30	13-Feb-2020 18:01	☐
HS20020571-06	SO-1620-SG15(5.5-6)20200213	Soil		13-Feb-2020 14:40	13-Feb-2020 18:01	☐

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG17(0.5-1)20200212
Collection Date: 12-Feb-2020 15:40

ANALYTICAL REPORT
WorkOrder:HS20020571
Lab ID:HS20020571-01
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00071	0.0071	mg/Kg-dry	1	18-Feb-2020 00:53
Ethylbenzene		U	0.0010	0.0071	mg/Kg-dry	1	18-Feb-2020 00:53
Xylenes, Total		U	0.0014	0.0071	mg/Kg-dry	1	18-Feb-2020 00:53
Surr: 1,2-Dichloroethane-d4	*79.2*			*70-126*	*%REC*	*1*	*18-Feb-2020 00:53*
Surr: 4-Bromofluorobenzene	*91.5*			*70-130*	*%REC*	*1*	*18-Feb-2020 00:53*
Surr: Dibromofluoromethane	*88.2*			*70-130*	*%REC*	*1*	*18-Feb-2020 00:53*
Surr: Toluene-d8	*109*			*70-130*	*%REC*	*1*	*18-Feb-2020 00:53*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 17-Feb-2020		Analyst: GEY
Naphthalene	**0.0095**		**0.00070**	**0.0038**	**mg/Kg-dry**	1	19-Feb-2020 15:55
Surr: 2-Fluorobiphenyl	*74.2*			*43-125*	*%REC*	*1*	*19-Feb-2020 15:55*
Surr: 4-Terphenyl-d14	*89.2*			*32-125*	*%REC*	*1*	*19-Feb-2020 15:55*
Surr: Nitrobenzene-d5	*60.6*			*37-125*	*%REC*	*1*	*19-Feb-2020 15:55*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**13.7**		**0.0100**	**0.0100**	**wt%**	1	18-Feb-2020 09:20

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG17(5.5-6)20200212
Collection Date: 12-Feb-2020 15:50

ANALYTICAL REPORT
WorkOrder:HS20020571
Lab ID:HS20020571-02
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene	U		0.00079	0.0079	mg/Kg-dry	1	18-Feb-2020 01:16
Ethylbenzene	U		0.0011	0.0079	mg/Kg-dry	1	18-Feb-2020 01:16
Xylenes, Total	U		0.0016	0.0079	mg/Kg-dry	1	18-Feb-2020 01:16
Surr: 1,2-Dichloroethane-d4	*83.9*			*70-126*	*%REC*	*1*	*18-Feb-2020 01:16*
Surr: 4-Bromofluorobenzene	*99.0*			*70-130*	*%REC*	*1*	*18-Feb-2020 01:16*
Surr: Dibromofluoromethane	*91.0*			*70-130*	*%REC*	*1*	*18-Feb-2020 01:16*
Surr: Toluene-d8	*109*			*70-130*	*%REC*	*1*	*18-Feb-2020 01:16*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 17-Feb-2020		Analyst: GEY
Naphthalene	**0.0015**	J	**0.00073**	**0.0040**	**mg/Kg-dry**	1	19-Feb-2020 16:14
Surr: 2-Fluorobiphenyl	*77.0*			*43-125*	*%REC*	*1*	*19-Feb-2020 16:14*
Surr: 4-Terphenyl-d14	*73.4*			*32-125*	*%REC*	*1*	*19-Feb-2020 16:14*
Surr: Nitrobenzene-d5	*52.0*			*37-125*	*%REC*	*1*	*19-Feb-2020 16:14*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**17.8**		**0.0100**	**0.0100**	**wt%**	1	18-Feb-2020 09:20

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG16(0.5-1)20200213
Collection Date: 13-Feb-2020 12:15

ANALYTICAL REPORT
WorkOrder:HS20020571
Lab ID:HS20020571-03
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00066	0.0066	mg/Kg-dry	1	18-Feb-2020 01:39
Ethylbenzene		U	0.00093	0.0066	mg/Kg-dry	1	18-Feb-2020 01:39
Xylenes, Total		U	0.0013	0.0066	mg/Kg-dry	1	18-Feb-2020 01:39
Surr: 1,2-Dichloroethane-d4	*80.6*			*70-126*	*%REC*	*1*	*18-Feb-2020 01:39*
Surr: 4-Bromofluorobenzene	*97.3*			*70-130*	*%REC*	*1*	*18-Feb-2020 01:39*
Surr: Dibromofluoromethane	*88.6*			*70-130*	*%REC*	*1*	*18-Feb-2020 01:39*
Surr: Toluene-d8	*108*			*70-130*	*%REC*	*1*	*18-Feb-2020 01:39*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 17-Feb-2020		Analyst: GEY
Naphthalene	**0.0099**		**0.00069**	**0.0038**	**mg/Kg-dry**	1	19-Feb-2020 16:34
Surr: 2-Fluorobiphenyl	*68.8*			*43-125*	*%REC*	*1*	*19-Feb-2020 16:34*
Surr: 4-Terphenyl-d14	*99.4*			*32-125*	*%REC*	*1*	*19-Feb-2020 16:34*
Surr: Nitrobenzene-d5	*64.2*			*37-125*	*%REC*	*1*	*19-Feb-2020 16:34*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**13.1**		**0.0100**	**0.0100**	**wt%**	1	18-Feb-2020 09:20

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG16(5.5-6)20200213
Collection Date: 13-Feb-2020 12:30

ANALYTICAL REPORT
WorkOrder:HS20020571
Lab ID:HS20020571-04
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00068	0.0068	mg/Kg-dry	1	18-Feb-2020 02:02
Ethylbenzene		U	0.00095	0.0068	mg/Kg-dry	1	18-Feb-2020 02:02
Xylenes, Total		U	0.0014	0.0068	mg/Kg-dry	1	18-Feb-2020 02:02
Surr: 1,2-Dichloroethane-d4	*76.0*			*70-126*	*%REC*	*1*	*18-Feb-2020 02:02*
Surr: 4-Bromofluorobenzene	*94.4*			*70-130*	*%REC*	*1*	*18-Feb-2020 02:02*
Surr: Dibromofluoromethane	*86.3*			*70-130*	*%REC*	*1*	*18-Feb-2020 02:02*
Surr: Toluene-d8	*105*			*70-130*	*%REC*	*1*	*18-Feb-2020 02:02*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 17-Feb-2020		Analyst: LG
Naphthalene		U	0.00071	0.0039	mg/Kg-dry	1	18-Feb-2020 20:21
Surr: 2-Fluorobiphenyl	*75.9*			*43-125*	*%REC*	*1*	*18-Feb-2020 20:21*
Surr: 4-Terphenyl-d14	*83.6*			*32-125*	*%REC*	*1*	*18-Feb-2020 20:21*
Surr: Nitrobenzene-d5	*58.1*			*37-125*	*%REC*	*1*	*18-Feb-2020 20:21*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**17.2**		**0.0100**	**0.0100**	**wt%**	1	18-Feb-2020 09:20

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG15(0.5-1)20200213
Collection Date: 13-Feb-2020 14:30

ANALYTICAL REPORT
WorkOrder:HS20020571
Lab ID:HS20020571-05
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00050	0.0050	mg/Kg-dry	1	18-Feb-2020 02:25
Ethylbenzene		U	0.00070	0.0050	mg/Kg-dry	1	18-Feb-2020 02:25
Xylenes, Total		U	0.0010	0.0050	mg/Kg-dry	1	18-Feb-2020 02:25
Surr: 1,2-Dichloroethane-d4	*80.7*			*70-126*	*%REC*	*1*	*18-Feb-2020 02:25*
Surr: 4-Bromofluorobenzene	*96.9*			*70-130*	*%REC*	*1*	*18-Feb-2020 02:25*
Surr: Dibromofluoromethane	*88.2*			*70-130*	*%REC*	*1*	*18-Feb-2020 02:25*
Surr: Toluene-d8	*107*			*70-130*	*%REC*	*1*	*18-Feb-2020 02:25*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 18-Feb-2020		Analyst: GEY
Naphthalene	**0.014**		**0.00067**	**0.0037**	**mg/Kg-dry**	1	19-Feb-2020 15:35
Surr: 2-Fluorobiphenyl	*45.0*			*43-125*	*%REC*	*1*	*19-Feb-2020 15:35*
Surr: 4-Terphenyl-d14	*60.0*			*32-125*	*%REC*	*1*	*19-Feb-2020 15:35*
Surr: Nitrobenzene-d5	*39.9*			*37-125*	*%REC*	*1*	*19-Feb-2020 15:35*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**10.6**		**0.0100**	**0.0100**	**wt%**	1	18-Feb-2020 09:20

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG15(5.5-6)20200213
Collection Date: 13-Feb-2020 14:40

ANALYTICAL REPORT
WorkOrder:HS20020571
Lab ID:HS20020571-06
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00032	0.0032	mg/Kg-dry	1	18-Feb-2020 02:48
Ethylbenzene		U	0.00045	0.0032	mg/Kg-dry	1	18-Feb-2020 02:48
Xylenes, Total		U	0.00065	0.0032	mg/Kg-dry	1	18-Feb-2020 02:48
Surr: 1,2-Dichloroethane-d4	*78.6*			*70-126*	*%REC*	*1*	*18-Feb-2020 02:48*
Surr: 4-Bromofluorobenzene	*97.5*			*70-130*	*%REC*	*1*	*18-Feb-2020 02:48*
Surr: Dibromofluoromethane	*88.1*			*70-130*	*%REC*	*1*	*18-Feb-2020 02:48*
Surr: Toluene-d8	*109*			*70-130*	*%REC*	*1*	*18-Feb-2020 02:48*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 18-Feb-2020		Analyst: GEY
Naphthalene		U	0.00071	0.0039	mg/Kg-dry	1	19-Feb-2020 13:38
Surr: 2-Fluorobiphenyl	*53.8*			*43-125*	*%REC*	*1*	*19-Feb-2020 13:38*
Surr: 4-Terphenyl-d14	*64.6*			*32-125*	*%REC*	*1*	*19-Feb-2020 13:38*
Surr: Nitrobenzene-d5	*48.4*			*37-125*	*%REC*	*1*	*19-Feb-2020 13:38*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**15.2**		**0.0100**	**0.0100**	**wt%**	1	18-Feb-2020 09:20

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
WorkOrder: HS20020571

Batch ID: 3615 **Start Date:** 14 Feb 2020 14:41 **End Date:** 14 Feb 2020 14:41
Method: VOLATILES BY SW8260C

Sample ID	Container	Sample Wt/Vol	Final Volume	Weight Factor	Container Type
HS20020571-01	1	4.065 (g)	5 (mL)	1.23	TerraCore (5035A)
HS20020571-02	1	3.853 (g)	5 (mL)	1.3	TerraCore (5035A)
HS20020571-03	1	4.352 (g)	5 (mL)	1.15	TerraCore (5035A)
HS20020571-04	1	4.448 (g)	5 (mL)	1.12	TerraCore (5035A)
HS20020571-05	1	5.638 (g)	5 (mL)	0.89	TerraCore (5035A)
HS20020571-06	1	9.1 (g)	5 (mL)	0.55	TerraCore (5035A)

Batch ID: 150668 **Start Date:** 17 Feb 2020 07:30 **End Date:** 17 Feb 2020 10:15
Method: SV SOXHLET EXTRACT-LOWLEVEL-SW3541 **Prep Code:** 3541_B_LOW

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20020571-01		30.01 (g)	1 (mL)	0.03332
HS20020571-02		30.2 (g)	1 (mL)	0.03311
HS20020571-03		30.06 (g)	1 (mL)	0.03327
HS20020571-04		30.49 (g)	1 (mL)	0.0328

Batch ID: 150728 **Start Date:** 18 Feb 2020 11:34 **End Date:** 18 Feb 2020 17:30
Method: SV SOXHLET EXTRACT-LOWLEVEL-SW3541 **Prep Code:** 3541_B_LOW

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20020571-05		30.01 (g)	1 (mL)	0.03332
HS20020571-06		30.03 (g)	1 (mL)	0.0333

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020571

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 150668 (0)	**Test Name :** LOW-LEVEL SEMIVOLATILES BY 8270D				**Matrix:** Soil	
HS20020571-01	SO-1620-SG17(0.5-1) 20200212	12 Feb 2020 15:40		17 Feb 2020 07:30	19 Feb 2020 15:55	1
HS20020571-02	SO-1620-SG17(5.5-6) 20200212	12 Feb 2020 15:50		17 Feb 2020 07:30	19 Feb 2020 16:14	1
HS20020571-03	SO-1620-SG16(0.5-1) 20200213	13 Feb 2020 12:15		17 Feb 2020 07:30	19 Feb 2020 16:34	1
HS20020571-04	SO-1620-SG16(5.5-6) 20200213	13 Feb 2020 12:30		17 Feb 2020 07:30	18 Feb 2020 20:21	1
Batch ID: 150728 (0)	**Test Name :** LOW-LEVEL SEMIVOLATILES BY 8270D				**Matrix:** Soil	
HS20020571-05	SO-1620-SG15(0.5-1) 20200213	13 Feb 2020 14:30		18 Feb 2020 11:34	19 Feb 2020 15:35	1
HS20020571-06	SO-1620-SG15(5.5-6) 20200213	13 Feb 2020 14:40		18 Feb 2020 11:34	19 Feb 2020 13:38	1
Batch ID: R356419 (0)	**Test Name :** VOLATILES BY SW8260C				**Matrix:** Soil	
HS20020571-01	SO-1620-SG17(0.5-1) 20200212	12 Feb 2020 15:40			18 Feb 2020 00:53	1
HS20020571-02	SO-1620-SG17(5.5-6) 20200212	12 Feb 2020 15:50			18 Feb 2020 01:16	1
HS20020571-03	SO-1620-SG16(0.5-1) 20200213	13 Feb 2020 12:15			18 Feb 2020 01:39	1
HS20020571-04	SO-1620-SG16(5.5-6) 20200213	13 Feb 2020 12:30			18 Feb 2020 02:02	1
HS20020571-05	SO-1620-SG15(0.5-1) 20200213	13 Feb 2020 14:30			18 Feb 2020 02:25	1
HS20020571-06	SO-1620-SG15(5.5-6) 20200213	13 Feb 2020 14:40			18 Feb 2020 02:48	1
Batch ID: R356526 (0)	**Test Name :** MOISTURE - ASTM D2216				**Matrix:** Soil	
HS20020571-01	SO-1620-SG17(0.5-1) 20200212	12 Feb 2020 15:40			18 Feb 2020 09:20	1
HS20020571-02	SO-1620-SG17(5.5-6) 20200212	12 Feb 2020 15:50			18 Feb 2020 09:20	1
HS20020571-03	SO-1620-SG16(0.5-1) 20200213	13 Feb 2020 12:15			18 Feb 2020 09:20	1
HS20020571-04	SO-1620-SG16(5.5-6) 20200213	13 Feb 2020 12:30			18 Feb 2020 09:20	1
HS20020571-05	SO-1620-SG15(0.5-1) 20200213	13 Feb 2020 14:30			18 Feb 2020 09:20	1
HS20020571-06	SO-1620-SG15(5.5-6) 20200213	13 Feb 2020 14:40			18 Feb 2020 09:20	1

WorkOrder: HS20020571
InstrumentID: SV-7
Test Code: 8270_LOW_S
Test Number: SW8270
Test Name: Low-Level Semivolatiles by 8270D

METHOD DETECTION / REPORTING LIMITS

Matrix: Solid **Units:** mg/Kg

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Naphthalene	91-20-3	0.0017	0.0018	0.00060	0.0033
S	2-Fluorobiphenyl	321-60-8	0	0	0	0
S	4-Terphenyl-d14	1718-51-0	0	0	0	0
S	Nitrobenzene-d5	4165-60-0	0	0	0	0

WorkOrder: HS20020571
InstrumentID: SV-6
Test Code: 8270_LOW_S
Test Number: SW8270
Test Name: Low-Level Semivolatiles by 8270D

METHOD DETECTION / REPORTING LIMITS

Matrix: Solid **Units:** mg/Kg

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Naphthalene	91-20-3	0.0017	0.0019	0.00060	0.0033
S	2-Fluorobiphenyl	321-60-8	0	0	0	0
S	4-Terphenyl-d14	1718-51-0	0	0	0	0
S	Nitrobenzene-d5	4165-60-0	0	0	0	0

WorkOrder: HS20020571
InstrumentID: VOA8
Test Code: 8260_S
Test Number: SW8260
Test Name: Volatiles by SW8260C

METHOD DETECTION / REPORTING LIMITS

Matrix: Solid **Units:** mg/Kg

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Benzene	71-43-2	0.0012	0.0013	0.00050	0.0050
A	Ethylbenzene	100-41-4	0.0012	0.0014	0.00070	0.0050
A	Xylenes, Total	1330-20-7	0.0012	0.0014	0.0010	0.0050
S	1,2-Dichloroethane-d4	17060-07-0	0	0	0	0
S	4-Bromofluorobenzene	460-00-4	0	0	0	0
S	Dibromofluoromethane	1868-53-7	0	0	0	0
S	Toluene-d8	2037-26-5	0	0	0	0

WorkOrder: HS20020571
InstrumentID: Balance1
Test Code: MOIST_ASTM
Test Number: ASTM D2216
Test Name: Moisture - ASTM D2216

METHOD DETECTION / REPORTING LIMITS

Matrix: Solid **Units:** wt%

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Percent Moisture	MOIST	0.0100	0.0100	0.0100	0.0100

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020571

QC BATCH REPORT

Batch ID: 150668 (0) **Instrument: SV-6** **Method: LOW-LEVEL SEMIVOLATILES BY 8270D**

MBLK Sample ID: **MBLK-150668** Units: **ug/Kg** Analysis Date: **18-Feb-2020 10:47**
Client ID: Run ID: **SV-6_356483** SeqNo: **5477344** PrepDate: **17-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	U	3.3								
Surr: 2-Fluorobiphenyl	*149.5*	*0*	*167*	*0*	*89.5*	*43 - 125*				
Surr: 4-Terphenyl-d14	*162.8*	*0*	*167*	*0*	*97.5*	*32 - 125*				
Surr: Nitrobenzene-d5	*115.6*	*0*	*167*	*0*	*69.2*	*37 - 125*				

LCS Sample ID: **LCS-150668** Units: **ug/Kg** Analysis Date: **18-Feb-2020 11:06**
Client ID: Run ID: **SV-6_356483** SeqNo: **5477345** PrepDate: **17-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	152.4	3.3	167	0	91.3	50 - 125				
Surr: 2-Fluorobiphenyl	*144.9*	*0*	*167*	*0*	*86.8*	*43 - 125*				
Surr: 4-Terphenyl-d14	*157.4*	*0*	*167*	*0*	*94.2*	*32 - 125*				
Surr: Nitrobenzene-d5	*110.3*	*0*	*167*	*0*	*66.1*	*37 - 125*				

MS Sample ID: **HS20020618-01MS** Units: **ug/Kg** Analysis Date: **18-Feb-2020 13:01**
Client ID: Run ID: **SV-6_356483** SeqNo: **5477347** PrepDate: **17-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	154.2	3.3	165.7	2.907	91.3	50 - 125				
Surr: 2-Fluorobiphenyl	*150.4*	*0*	*165.7*	*0*	*90.8*	*43 - 125*				
Surr: 4-Terphenyl-d14	*155.6*	*0*	*165.7*	*0*	*93.9*	*32 - 125*				
Surr: Nitrobenzene-d5	*110.9*	*0*	*165.7*	*0*	*67.0*	*37 - 125*				

MSD Sample ID: **HS20020618-01MSD** Units: **ug/Kg** Analysis Date: **18-Feb-2020 13:20**
Client ID: Run ID: **SV-6_356483** SeqNo: **5477348** PrepDate: **17-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	143.4	3.3	165.8	2.907	84.7	50 - 125	154.2	7.27	30	
Surr: 2-Fluorobiphenyl	*139.8*	*0*	*165.8*	*0*	*84.3*	*43 - 125*	*150.4*	*7.31*	*30*	
Surr: 4-Terphenyl-d14	*147.3*	*0*	*165.8*	*0*	*88.8*	*32 - 125*	*155.6*	*5.5*	*30*	
Surr: Nitrobenzene-d5	*100.1*	*0*	*165.8*	*0*	*60.4*	*37 - 125*	*110.9*	*10.3*	*30*	

The following samples were analyzed in this batch: HS20020571-01 HS20020571-02 HS20020571-03 HS20020571-04

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020571

QC BATCH REPORT

Batch ID: 150728 (0) **Instrument: SV-7** **Method: LOW-LEVEL SEMIVOLATILES BY 8270D**

MBLK Sample ID: **MBLK-150728** Units: **ug/Kg** Analysis Date: **19-Feb-2020 10:03**
Client ID: Run ID: **SV-7_356549** SeqNo: **5479049** PrepDate: **18-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	U	3.3								
Surr: 2-Fluorobiphenyl	*85.05*	*0*	*167*	*0*	*50.9*	*43 - 125*				
Surr: 4-Terphenyl-d14	*104.2*	*0*	*167*	*0*	*62.4*	*32 - 125*				
Surr: Nitrobenzene-d5	*78.83*	*0*	*167*	*0*	*47.2*	*37 - 125*				

LCS Sample ID: **LCS-150728** Units: **ug/Kg** Analysis Date: **19-Feb-2020 10:22**
Client ID: Run ID: **SV-7_356549** SeqNo: **5479050** PrepDate: **18-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	110.1	3.3	167	0	65.9	50 - 125				
Surr: 2-Fluorobiphenyl	*103.1*	*0*	*167*	*0*	*61.7*	*43 - 125*				
Surr: 4-Terphenyl-d14	*111.3*	*0*	*167*	*0*	*66.7*	*32 - 125*				
Surr: Nitrobenzene-d5	*103.7*	*0*	*167*	*0*	*62.1*	*37 - 125*				

MS Sample ID: **HS20020646-08MS** Units: **ug/Kg** Analysis Date: **19-Feb-2020 14:17**
Client ID: Run ID: **SV-7_356549** SeqNo: **5479109** PrepDate: **18-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	112.9	3.3	165	0	68.4	50 - 125				
Surr: 2-Fluorobiphenyl	*92.79*	*0*	*165*	*0*	*56.2*	*43 - 125*				
Surr: 4-Terphenyl-d14	*112.9*	*0*	*165*	*0*	*68.4*	*32 - 125*				
Surr: Nitrobenzene-d5	*92.08*	*0*	*165*	*0*	*55.8*	*37 - 125*				

MSD Sample ID: **HS20020646-08MSD** Units: **ug/Kg** Analysis Date: **19-Feb-2020 14:37**
Client ID: Run ID: **SV-7_356549** SeqNo: **5479110** PrepDate: **18-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	103.5	3.3	166.6	0	62.1	50 - 125	112.9	8.7	30	
Surr: 2-Fluorobiphenyl	*84.78*	*0*	*166.6*	*0*	*50.9*	*43 - 125*	*92.79*	*9.02*	*30*	
Surr: 4-Terphenyl-d14	*111.3*	*0*	*166.6*	*0*	*66.8*	*32 - 125*	*112.9*	*1.4*	*30*	
Surr: Nitrobenzene-d5	*74.44*	*0*	*166.6*	*0*	*44.7*	*37 - 125*	*92.08*	*21.2*	*30*	

The following samples were analyzed in this batch: HS20020571-05 HS20020571-06

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020571

QC BATCH REPORT

Batch ID: R356419 (0) **Instrument: VOA8** **Method: VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKS2-021720** Units: **ug/Kg** Analysis Date: **17-Feb-2020 21:04**
Client ID: Run ID: **VOA8_356419** SeqNo: **5475882** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	5.0								
Ethylbenzene	U	5.0								
Xylenes, Total	U	5.0								
Surr: 1,2-Dichloroethane-d4	*40.58*	*0*	*50*	*0*	*81.2*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*45.93*	*0*	*50*	*0*	*91.9*	*80 - 120*				
Surr: Dibromofluoromethane	*45.06*	*0*	*50*	*0*	*90.1*	*80 - 119*				
Surr: Toluene-d8	*50.63*	*0*	*50*	*0*	*101*	*81 - 118*				

LCS Sample ID: **VLCSS2-021720** Units: **ug/Kg** Analysis Date: **17-Feb-2020 20:18**
Client ID: Run ID: **VOA8_356419** SeqNo: **5475881** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	49.93	5.0	50	0	99.9	75 - 124				
Ethylbenzene	49.66	5.0	50	0	99.3	70 - 123				
Xylenes, Total	146.1	5.0	150	0	97.4	77 - 128				
Surr: 1,2-Dichloroethane-d4	*46.26*	*0*	*50*	*0*	*92.5*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*49.67*	*0*	*50*	*0*	*99.3*	*80 - 120*				
Surr: Dibromofluoromethane	*49.24*	*0*	*50*	*0*	*98.5*	*80 - 119*				
Surr: Toluene-d8	*49.65*	*0*	*50*	*0*	*99.3*	*81 - 118*				

MS Sample ID: **HS20020397-01MS** Units: **ug/Kg** Analysis Date: **17-Feb-2020 21:50**
Client ID: Run ID: **VOA8_356419** SeqNo: **5475884** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	35.15	4.9	49	0	71.7	70 - 130				
Ethylbenzene	26.61	4.9	49	0	54.3	70 - 130				S
Xylenes, Total	77.68	4.9	147	0	52.8	70 - 130				S
Surr: 1,2-Dichloroethane-d4	*47.61*	*0*	*49*	*0*	*97.2*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*49.55*	*0*	*49*	*0*	*101*	*70 - 130*				
Surr: Dibromofluoromethane	*49.43*	*0*	*49*	*0*	*101*	*70 - 130*				
Surr: Toluene-d8	*49.45*	*0*	*49*	*0*	*101*	*70 - 130*				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020571

QC BATCH REPORT

Batch ID: R356419 (0) **Instrument: VOA8** **Method: VOLATILES BY SW8260C**

MSD Sample ID: **HS20020397-01MSD** Units: **ug/Kg** Analysis Date: **17-Feb-2020 22:13**
Client ID: Run ID: **VOA8_356419** SeqNo: **5475885** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	41.85	4.9	49	0	85.4	70 - 130	35.15	17.4	30	
Ethylbenzene	26.7	4.9	49	0	54.5	70 - 130	26.61	0.348	30	S
Xylenes, Total	75.56	4.9	147	0	51.4	70 - 130	77.68	2.77	30	S
Surr: 1,2-Dichloroethane-d4	*61.16*	*0*	*49*	*0*	*125*	*70 - 126*	*47.61*	*24.9*	*30*	
Surr: 4-Bromofluorobenzene	*50.78*	*0*	*49*	*0*	*104*	*70 - 130*	*49.55*	*2.45*	*30*	
Surr: Dibromofluoromethane	*59.17*	*0*	*49*	*0*	*121*	*70 - 130*	*49.43*	*17.9*	*30*	
Surr: Toluene-d8	*48.03*	*0*	*49*	*0*	*98.0*	*70 - 130*	*49.45*	*2.91*	*30*	

The following samples were analyzed in this batch: HS20020571-01 HS20020571-02 HS20020571-03 HS20020571-04 HS20020571-05 HS20020571-06

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020571

QC BATCH REPORT

Batch ID: **R356526 (0)** **Instrument:** **Balance1** **Method:** **MOISTURE - ASTM D2216**

DUP Sample ID: **HS20020571-06DUP** Units: **wt%** Analysis Date: **18-Feb-2020 09:20**
Client ID: **SO-1620-SG15(5.5-6)20200213** Run ID: **Balance1_356526** SeqNo: **5478088** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Percent Moisture	15.1	0.0100					15.2	0.66	20	

The following samples were analyzed in this batch: HS20020571-01 HS20020571-02 HS20020571-03 HS20020571-04 HS20020571-05 HS20020571-06

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: **HS20020571**

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/Kg-dry	Milligrams per Kilogram- Dry weight corrected

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231 V009	22-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

Sample Receipt Checklist

Client Name: PBW
Work Order: HS20020571

Date/Time Received: **13-Feb-2020 18:01**
Received by: **JRM**

Checklist completed by: *Paresh M. Giga* eSignature — 13-Feb-2020 Date

Reviewed by: *Dane J. Wacasey* eSignature — 14-Feb-2020 Date

Matrices: **Soil**

Carrier name: **Client**

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 ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:214098
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):	2.3°C UC/C	IR11	
Cooler(s)/Kit(s):	43057		
Date/Time sample(s) sent to storage:	2/13/2020 19:40		
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:

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 _____ of _____

COC ID: 214098

HS20020571

Golder Associates Inc.
Houston TX-Wood Preserving Works

Customer Information		Project Information		ALS Project Manager:
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works	
Work Order		Project Number	1620-11-Rev0 SR 92688	
Company Name	Golder Associates Inc.	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	8260_S (5652652 B,E,X)
B	8270_LOW_S (5632532 SVOC - Naphthalene only)
C	MOIST_ASTM (5631931 Gen.Chem. MOIST%)
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	SO-1620- SG17 (0.5-1) 20200212	2-12-20	1540	Soil	8,9	5	X	X	X								
2	SG17 (5.5-6)	2-12-20	1550														
3	SG16 (0.5-1) 20200213	2-13-20	1215														
4	SG16 (5.5-6)		1230														
5	SG15 (0.5-1)		1430														
6	SG15 (5.5-6)		1440														
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Anthony Repol

Shipment Method:

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

Results Due Date:

Relinquished by: _____ Date: 2-13-20 Time: 1801 Received by: _____

Relinquished by: _____ Date: 2/13/20 Time: 18:01 Received by (Laboratory): J. McAleer

Logged by (Laboratory): _____ Date: _____ Time: _____ Checked by (Laboratory): _____

Notes: UPRR HWPW 1620-11

Cooler ID	Cooler Temp.
4.3057	2.3
	1.2.11
	0.5-0.0

QC Package: (Check One Box Below)

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

ote:
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.

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

February 26, 2020

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

Work Order: **HS20020741**

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

Dear Eric,

ALS Environmental received 8 sample(s) on Feb 18, 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	
WorkOrder:	**HS20020741**	

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	
WorkOrder:	**HS20020741**	

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: 02/26/2020				
Project Name: Houston TX-Wood Preserving Works			Laboratory Job Number: HS20020741				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 150835,R356625,R356904				
#[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				
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			1
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				2
		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: 02/26/2020				
Project Name: Houston TX-Wood Preserving Works			Laboratory Job Number: HS20020741				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 150835,R356625,R356904				
#[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: 02/26/2020
Project Name: Houston TX-Wood Preserving Works	Laboratory Job Number: HS20020741
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 150835,R356625,R356904

ER#[5]	Description
1	Batch 150835, Semivolatile Organics Method SW8270, sample HS2020747-03, MS/MSD RPD is for an unrelated sample.
2	Batch 150835, Semivolatile Organics Method SW8270, samples SO-1620-SG07(0.5-1)20200217 and SO-1620-SG06(0.5-1)20200217: the GCMS semi-volatile extract of this sample was run at a dilution due to a high level of matrix interference.

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
Work Order: HS20020741

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20020741-01	SO-1620-SG12(0.5-1)20200217	Soil		17-Feb-2020 09:11	18-Feb-2020 17:40	☐
HS20020741-02	SO-1620-SG12(5.5-6)20200217	Soil		17-Feb-2020 09:30	18-Feb-2020 17:40	☐
HS20020741-03	SO-1620-SG07(0.5-1)20200217	Soil		17-Feb-2020 10:50	18-Feb-2020 17:40	☐
HS20020741-04	SO-1620-SG07(5.5-6)20200217	Soil		17-Feb-2020 11:10	18-Feb-2020 17:40	☐
HS20020741-05	SO-1620-SG06(0.5-1)20200217	Soil		17-Feb-2020 14:00	18-Feb-2020 17:40	☐
HS20020741-06	SO-1620-SG06(5.5-6)20200217	Soil		17-Feb-2020 14:15	18-Feb-2020 17:40	☐
HS20020741-07	SO-1620-SG14(0.5-1)20200217	Soil		17-Feb-2020 16:15	18-Feb-2020 17:40	☐
HS20020741-08	SO-1620-SG14(5.5-6)20200217	Soil		17-Feb-2020 16:30	18-Feb-2020 17:40	☐

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG12(0.5-1)20200217
Collection Date: 17-Feb-2020 09:11

ANALYTICAL REPORT
WorkOrder:HS20020741
Lab ID:HS20020741-01
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00062	0.0062	mg/Kg-dry	1	20-Feb-2020 10:54
Ethylbenzene		U	0.00087	0.0062	mg/Kg-dry	1	20-Feb-2020 10:54
Xylenes, Total		U	0.0012	0.0062	mg/Kg-dry	1	20-Feb-2020 10:54
Surr: 1,2-Dichloroethane-d4	*84.1*			*70-126*	*%REC*	*1*	*20-Feb-2020 10:54*
Surr: 4-Bromofluorobenzene	*97.1*			*70-130*	*%REC*	*1*	*20-Feb-2020 10:54*
Surr: Dibromofluoromethane	*88.9*			*70-130*	*%REC*	*1*	*20-Feb-2020 10:54*
Surr: Toluene-d8	*107*			*70-130*	*%REC*	*1*	*20-Feb-2020 10:54*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 20-Feb-2020		Analyst: LG
Naphthalene	**0.0039**		**0.00067**	**0.0037**	**mg/Kg-dry**	1	21-Feb-2020 22:53
Surr: 2-Fluorobiphenyl	*58.3*			*43-125*	*%REC*	*1*	*21-Feb-2020 22:53*
Surr: 4-Terphenyl-d14	*70.0*			*32-125*	*%REC*	*1*	*21-Feb-2020 22:53*
Surr: Nitrobenzene-d5	*44.2*			*37-125*	*%REC*	*1*	*21-Feb-2020 22:53*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**10.2**		**0.0100**	**0.0100**	**wt%**	1	24-Feb-2020 09:04

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG12(5.5-6)20200217
Collection Date: 17-Feb-2020 09:30

ANALYTICAL REPORT
WorkOrder:HS20020741
Lab ID:HS20020741-02
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00060	0.0060	mg/Kg-dry	1	20-Feb-2020 11:32
Ethylbenzene		U	0.00084	0.0060	mg/Kg-dry	1	20-Feb-2020 11:32
Xylenes, Total		U	0.0012	0.0060	mg/Kg-dry	1	20-Feb-2020 11:32
Surr: 1,2-Dichloroethane-d4	*76.1*			*70-126*	*%REC*	*1*	*20-Feb-2020 11:32*
Surr: 4-Bromofluorobenzene	*96.3*			*70-130*	*%REC*	*1*	*20-Feb-2020 11:32*
Surr: Dibromofluoromethane	*86.6*			*70-130*	*%REC*	*1*	*20-Feb-2020 11:32*
Surr: Toluene-d8	*108*			*70-130*	*%REC*	*1*	*20-Feb-2020 11:32*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 20-Feb-2020		Analyst: LG
Naphthalene		U	0.00071	0.0039	mg/Kg-dry	1	21-Feb-2020 23:13
Surr: 2-Fluorobiphenyl	*74.4*			*43-125*	*%REC*	*1*	*21-Feb-2020 23:13*
Surr: 4-Terphenyl-d14	*86.6*			*32-125*	*%REC*	*1*	*21-Feb-2020 23:13*
Surr: Nitrobenzene-d5	*52.7*			*37-125*	*%REC*	*1*	*21-Feb-2020 23:13*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**16.2**		**0.0100**	**0.0100**	**wt%**	1	24-Feb-2020 09:04

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG07(0.5-1)20200217
Collection Date: 17-Feb-2020 10:50

ANALYTICAL REPORT
WorkOrder:HS20020741
Lab ID:HS20020741-03
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene	U		0.00058	0.0058	mg/Kg-dry	1	20-Feb-2020 11:55
Ethylbenzene	U		0.00082	0.0058	mg/Kg-dry	1	20-Feb-2020 11:55
Xylenes, Total	U		0.0012	0.0058	mg/Kg-dry	1	20-Feb-2020 11:55
Surr: 1,2-Dichloroethane-d4	*71.8*			*70-126*	*%REC*	*1*	*20-Feb-2020 11:55*
Surr: 4-Bromofluorobenzene	*91.4*			*70-130*	*%REC*	*1*	*20-Feb-2020 11:55*
Surr: Dibromofluoromethane	*82.9*			*70-130*	*%REC*	*1*	*20-Feb-2020 11:55*
Surr: Toluene-d8	*108*			*70-130*	*%REC*	*1*	*20-Feb-2020 11:55*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 20-Feb-2020		Analyst: LG
Naphthalene	**0.0071**	J	**0.0034**	**0.019**	**mg/Kg-dry**	5	21-Feb-2020 23:32
Surr: 2-Fluorobiphenyl	*75.1*			*43-125*	*%REC*	*5*	*21-Feb-2020 23:32*
Surr: 4-Terphenyl-d14	*94.4*			*32-125*	*%REC*	*5*	*21-Feb-2020 23:32*
Surr: Nitrobenzene-d5	*51.8*			*37-125*	*%REC*	*5*	*21-Feb-2020 23:32*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**13.4**		**0.0100**	**0.0100**	**wt%**	1	24-Feb-2020 09:04

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG07(5.5-6)20200217
Collection Date: 17-Feb-2020 11:10

ANALYTICAL REPORT
WorkOrder:HS20020741
Lab ID:HS20020741-04
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00036	0.0036	mg/Kg-dry	1	20-Feb-2020 12:18
Ethylbenzene		U	0.00050	0.0036	mg/Kg-dry	1	20-Feb-2020 12:18
Xylenes, Total		U	0.00072	0.0036	mg/Kg-dry	1	20-Feb-2020 12:18
Surr: 1,2-Dichloroethane-d4	*70.8*			*70-126*	*%REC*	*1*	*20-Feb-2020 12:18*
Surr: 4-Bromofluorobenzene	*94.3*			*70-130*	*%REC*	*1*	*20-Feb-2020 12:18*
Surr: Dibromofluoromethane	*83.0*			*70-130*	*%REC*	*1*	*20-Feb-2020 12:18*
Surr: Toluene-d8	*110*			*70-130*	*%REC*	*1*	*20-Feb-2020 12:18*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 20-Feb-2020		Analyst: LG
Naphthalene		U	0.00072	0.0040	mg/Kg-dry	1	24-Feb-2020 12:11
Surr: 2-Fluorobiphenyl	*78.0*			*43-125*	*%REC*	*1*	*24-Feb-2020 12:11*
Surr: 4-Terphenyl-d14	*85.4*			*32-125*	*%REC*	*1*	*24-Feb-2020 12:11*
Surr: Nitrobenzene-d5	*65.1*			*37-125*	*%REC*	*1*	*24-Feb-2020 12:11*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**16.8**		**0.0100**	**0.0100**	**wt%**	1	24-Feb-2020 09:04

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG06(0.5-1)20200217
Collection Date: 17-Feb-2020 14:00

ANALYTICAL REPORT
WorkOrder:HS20020741
Lab ID:HS20020741-05
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00065	0.0065	mg/Kg-dry	1	20-Feb-2020 12:41
Ethylbenzene		U	0.00091	0.0065	mg/Kg-dry	1	20-Feb-2020 12:41
Xylenes, Total		U	0.0013	0.0065	mg/Kg-dry	1	20-Feb-2020 12:41
Surr: 1,2-Dichloroethane-d4	*70.7*			*70-126*	*%REC*	*1*	*20-Feb-2020 12:41*
Surr: 4-Bromofluorobenzene	*91.2*			*70-130*	*%REC*	*1*	*20-Feb-2020 12:41*
Surr: Dibromofluoromethane	*82.2*			*70-130*	*%REC*	*1*	*20-Feb-2020 12:41*
Surr: Toluene-d8	*110*			*70-130*	*%REC*	*1*	*20-Feb-2020 12:41*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 20-Feb-2020		Analyst: LG
Naphthalene		U	0.0067	0.037	mg/Kg-dry	10	24-Feb-2020 18:52
Surr: 2-Fluorobiphenyl	*69.7*			*43-125*	*%REC*	*10*	*24-Feb-2020 18:52*
Surr: 4-Terphenyl-d14	*74.4*			*32-125*	*%REC*	*10*	*24-Feb-2020 18:52*
Surr: Nitrobenzene-d5	*56.0*			*37-125*	*%REC*	*10*	*24-Feb-2020 18:52*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**10.3**		**0.0100**	**0.0100**	**wt%**	1	24-Feb-2020 09:04

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG06(5.5-6)20200217
Collection Date: 17-Feb-2020 14:15

ANALYTICAL REPORT
WorkOrder:HS20020741
Lab ID:HS20020741-06
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00042	0.0042	mg/Kg-dry	1	20-Feb-2020 13:04
Ethylbenzene		U	0.00059	0.0042	mg/Kg-dry	1	20-Feb-2020 13:04
Xylenes, Total		U	0.00084	0.0042	mg/Kg-dry	1	20-Feb-2020 13:04
Surr: 1,2-Dichloroethane-d4	*71.9*			*70-126*	*%REC*	*1*	*20-Feb-2020 13:04*
Surr: 4-Bromofluorobenzene	*93.9*			*70-130*	*%REC*	*1*	*20-Feb-2020 13:04*
Surr: Dibromofluoromethane	*83.9*			*70-130*	*%REC*	*1*	*20-Feb-2020 13:04*
Surr: Toluene-d8	*110*			*70-130*	*%REC*	*1*	*20-Feb-2020 13:04*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 20-Feb-2020		Analyst: LG
Naphthalene		U	0.00071	0.0039	mg/Kg-dry	1	24-Feb-2020 12:30
Surr: 2-Fluorobiphenyl	*69.7*			*43-125*	*%REC*	*1*	*24-Feb-2020 12:30*
Surr: 4-Terphenyl-d14	*77.5*			*32-125*	*%REC*	*1*	*24-Feb-2020 12:30*
Surr: Nitrobenzene-d5	*56.2*			*37-125*	*%REC*	*1*	*24-Feb-2020 12:30*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**15.5**		**0.0100**	**0.0100**	**wt%**	1	24-Feb-2020 09:04

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG14(0.5-1)20200217
Collection Date: 17-Feb-2020 16:15

ANALYTICAL REPORT
WorkOrder:HS20020741
Lab ID:HS20020741-07
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene	U		0.00030	0.0030	mg/Kg-dry	1	20-Feb-2020 13:27
Ethylbenzene	U		0.00042	0.0030	mg/Kg-dry	1	20-Feb-2020 13:27
Xylenes, Total	U		0.00061	0.0030	mg/Kg-dry	1	20-Feb-2020 13:27
Surr: 1,2-Dichloroethane-d4	*73.0*			*70-126*	*%REC*	*1*	*20-Feb-2020 13:27*
Surr: 4-Bromofluorobenzene	*91.5*			*70-130*	*%REC*	*1*	*20-Feb-2020 13:27*
Surr: Dibromofluoromethane	*84.1*			*70-130*	*%REC*	*1*	*20-Feb-2020 13:27*
Surr: Toluene-d8	*110*			*70-130*	*%REC*	*1*	*20-Feb-2020 13:27*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 20-Feb-2020		Analyst: LG
Naphthalene	**0.0027**	J	**0.00069**	**0.0038**	**mg/Kg-dry**	1	24-Feb-2020 19:11
Surr: 2-Fluorobiphenyl	*67.9*			*43-125*	*%REC*	*1*	*24-Feb-2020 19:11*
Surr: 4-Terphenyl-d14	*82.2*			*32-125*	*%REC*	*1*	*24-Feb-2020 19:11*
Surr: Nitrobenzene-d5	*49.2*			*37-125*	*%REC*	*1*	*24-Feb-2020 19:11*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**14.1**		**0.0100**	**0.0100**	**wt%**	1	24-Feb-2020 09:04

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG14(5.5-6)20200217
Collection Date: 17-Feb-2020 16:30

ANALYTICAL REPORT
WorkOrder:HS20020741
Lab ID:HS20020741-08
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00037	0.0037	mg/Kg-dry	1	20-Feb-2020 13:50
Ethylbenzene		U	0.00051	0.0037	mg/Kg-dry	1	20-Feb-2020 13:50
Xylenes, Total		U	0.00073	0.0037	mg/Kg-dry	1	20-Feb-2020 13:50
Surr: 1,2-Dichloroethane-d4	*83.5*			*70-126*	*%REC*	*1*	*20-Feb-2020 13:50*
Surr: 4-Bromofluorobenzene	*96.3*			*70-130*	*%REC*	*1*	*20-Feb-2020 13:50*
Surr: Dibromofluoromethane	*86.8*			*70-130*	*%REC*	*1*	*20-Feb-2020 13:50*
Surr: Toluene-d8	*107*			*70-130*	*%REC*	*1*	*20-Feb-2020 13:50*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 20-Feb-2020		Analyst: LG
Naphthalene		U	0.00077	0.0042	mg/Kg-dry	1	24-Feb-2020 12:50
Surr: 2-Fluorobiphenyl	*73.7*			*43-125*	*%REC*	*1*	*24-Feb-2020 12:50*
Surr: 4-Terphenyl-d14	*80.2*			*32-125*	*%REC*	*1*	*24-Feb-2020 12:50*
Surr: Nitrobenzene-d5	*58.7*			*37-125*	*%REC*	*1*	*24-Feb-2020 12:50*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**22.0**		**0.0100**	**0.0100**	**wt%**	1	24-Feb-2020 09:04

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
WorkOrder: HS20020741

Batch ID: 3620 **Start Date:** 19 Feb 2020 09:43 **End Date:** 19 Feb 2020 09:43
Method: VOLATILES BY SW8260C

Sample ID	Container	Sample Wt/Vol	Final Volume	Weight Factor	Container Type
HS20020741-01	1	4.471 (g)	5 (mL)	1.12	TerraCore (5035A)
HS20020741-02	1	4.941 (g)	5 (mL)	1.01	TerraCore (5035A)
HS20020741-03	1	4.928 (g)	5 (mL)	1.01	TerraCore (5035A)
HS20020741-04	1	8.391 (g)	5 (mL)	0.6	TerraCore (5035A)
HS20020741-05	1	4.269 (g)	5 (mL)	1.17	TerraCore (5035A)
HS20020741-06	1	7.075 (g)	5 (mL)	0.71	TerraCore (5035A)
HS20020741-07	1	9.694 (g)	5 (mL)	0.52	TerraCore (5035A)
HS20020741-08	1	8.796 (g)	5 (mL)	0.57	TerraCore (5035A)

Batch ID: 150835 **Start Date:** 21 Feb 2020 09:00 **End Date:** 21 Feb 2020 11:30
Method: SV SOXHLET EXTRACT-LOWLEVEL-SW3541 **Prep Code:** 3541_B_LOW

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20020741-01		30.05 (g)	1 (mL)	0.03328
HS20020741-02		30.15 (g)	1 (mL)	0.03317
HS20020741-03		30.22 (g)	1 (mL)	0.03309
HS20020741-04		30.01 (g)	1 (mL)	0.03332
HS20020741-05		30.09 (g)	1 (mL)	0.03323
HS20020741-06		30.1 (g)	1 (mL)	0.03322
HS20020741-07		30.24 (g)	1 (mL)	0.03307
HS20020741-08		30.16 (g)	1 (mL)	0.03316

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020741

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 150835 (0)	**Test Name :** LOW-LEVEL SEMIVOLATILES BY 8270D				**Matrix:** Soil	
HS20020741-01	SO-1620-SG12(0.5-1) 20200217	17 Feb 2020 09:11		20 Feb 2020 14:27	21 Feb 2020 22:53	1
HS20020741-02	SO-1620-SG12(5.5-6) 20200217	17 Feb 2020 09:30		20 Feb 2020 14:27	21 Feb 2020 23:13	1
HS20020741-03	SO-1620-SG07(0.5-1) 20200217	17 Feb 2020 10:50		20 Feb 2020 14:27	21 Feb 2020 23:32	5
HS20020741-04	SO-1620-SG07(5.5-6) 20200217	17 Feb 2020 11:10		20 Feb 2020 14:27	24 Feb 2020 12:11	1
HS20020741-05	SO-1620-SG06(0.5-1) 20200217	17 Feb 2020 14:00		20 Feb 2020 14:27	24 Feb 2020 18:52	10
HS20020741-06	SO-1620-SG06(5.5-6) 20200217	17 Feb 2020 14:15		20 Feb 2020 14:27	24 Feb 2020 12:30	1
HS20020741-07	SO-1620-SG14(0.5-1) 20200217	17 Feb 2020 16:15		20 Feb 2020 14:27	24 Feb 2020 19:11	1
HS20020741-08	SO-1620-SG14(5.5-6) 20200217	17 Feb 2020 16:30		20 Feb 2020 14:27	24 Feb 2020 12:50	1
Batch ID: R356625 (0)	**Test Name :** VOLATILES BY SW8260C				**Matrix:** Soil	
HS20020741-01	SO-1620-SG12(0.5-1) 20200217	17 Feb 2020 09:11			20 Feb 2020 10:54	1
HS20020741-02	SO-1620-SG12(5.5-6) 20200217	17 Feb 2020 09:30			20 Feb 2020 11:32	1
HS20020741-03	SO-1620-SG07(0.5-1) 20200217	17 Feb 2020 10:50			20 Feb 2020 11:55	1
HS20020741-04	SO-1620-SG07(5.5-6) 20200217	17 Feb 2020 11:10			20 Feb 2020 12:18	1
HS20020741-05	SO-1620-SG06(0.5-1) 20200217	17 Feb 2020 14:00			20 Feb 2020 12:41	1
HS20020741-06	SO-1620-SG06(5.5-6) 20200217	17 Feb 2020 14:15			20 Feb 2020 13:04	1
HS20020741-07	SO-1620-SG14(0.5-1) 20200217	17 Feb 2020 16:15			20 Feb 2020 13:27	1
HS20020741-08	SO-1620-SG14(5.5-6) 20200217	17 Feb 2020 16:30			20 Feb 2020 13:50	1
Batch ID: R356904 (0)	**Test Name :** MOISTURE - ASTM D2216				**Matrix:** Soil	
HS20020741-01	SO-1620-SG12(0.5-1) 20200217	17 Feb 2020 09:11			24 Feb 2020 09:04	1
HS20020741-02	SO-1620-SG12(5.5-6) 20200217	17 Feb 2020 09:30			24 Feb 2020 09:04	1
HS20020741-03	SO-1620-SG07(0.5-1) 20200217	17 Feb 2020 10:50			24 Feb 2020 09:04	1
HS20020741-04	SO-1620-SG07(5.5-6) 20200217	17 Feb 2020 11:10			24 Feb 2020 09:04	1
HS20020741-05	SO-1620-SG06(0.5-1) 20200217	17 Feb 2020 14:00			24 Feb 2020 09:04	1
HS20020741-06	SO-1620-SG06(5.5-6) 20200217	17 Feb 2020 14:15			24 Feb 2020 09:04	1
HS20020741-07	SO-1620-SG14(0.5-1) 20200217	17 Feb 2020 16:15			24 Feb 2020 09:04	1
HS20020741-08	SO-1620-SG14(5.5-6) 20200217	17 Feb 2020 16:30			24 Feb 2020 09:04	1

WorkOrder: HS20020741
InstrumentID: SV-6
Test Code: 8270_LOW_S
Test Number: SW8270
Test Name: Low-Level Semivolatiles by 8270D

METHOD DETECTION / REPORTING LIMITS

Matrix: Solid **Units:** mg/Kg

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Naphthalene	91-20-3	0.0017	0.0019	0.00060	0.0033
S	2-Fluorobiphenyl	321-60-8	0	0	0	0
S	4-Terphenyl-d14	1718-51-0	0	0	0	0
S	Nitrobenzene-d5	4165-60-0	0	0	0	0

WorkOrder: HS20020741
InstrumentID: VOA8
Test Code: 8260_S
Test Number: SW8260
Test Name: Volatiles by SW8260C

METHOD DETECTION / REPORTING LIMITS

Matrix: Solid **Units:** mg/Kg

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Benzene	71-43-2	0.0012	0.0013	0.00050	0.0050
A	Ethylbenzene	100-41-4	0.0012	0.0014	0.00070	0.0050
A	Xylenes, Total	1330-20-7	0.0012	0.0014	0.0010	0.0050
S	1,2-Dichloroethane-d4	17060-07-0	0	0	0	0
S	4-Bromofluorobenzene	460-00-4	0	0	0	0
S	Dibromofluoromethane	1868-53-7	0	0	0	0
S	Toluene-d8	2037-26-5	0	0	0	0

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020741

QC BATCH REPORT

Batch ID: 150835 (0) **Instrument: SV-6** **Method: LOW-LEVEL SEMIVOLATILES BY 8270D**

MBLK Sample ID: **MBLK-150835** Units: **ug/Kg** Analysis Date: **21-Feb-2020 12:39**
Client ID: Run ID: **SV-6_356813** SeqNo: **5483518** PrepDate: **20-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	U	3.3								
Surr: 2-Fluorobiphenyl	*133.5*	*0*	*167*	*0*	*79.9*	*43 - 125*				
Surr: 4-Terphenyl-d14	*142.1*	*0*	*167*	*0*	*85.1*	*32 - 125*				
Surr: Nitrobenzene-d5	*99.1*	*0*	*167*	*0*	*59.3*	*37 - 125*				

LCS Sample ID: **LCS-150835** Units: **ug/Kg** Analysis Date: **21-Feb-2020 12:58**
Client ID: Run ID: **SV-6_356813** SeqNo: **5483519** PrepDate: **20-Feb-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	134.3	3.3	167	0	80.4	50 - 125				
Surr: 2-Fluorobiphenyl	*117.3*	*0*	*167*	*0*	*70.3*	*43 - 125*				
Surr: 4-Terphenyl-d14	*128.5*	*0*	*167*	*0*	*77.0*	*32 - 125*				
Surr: Nitrobenzene-d5	*88.94*	*0*	*167*	*0*	*53.3*	*37 - 125*				

MS Sample ID: **HS20020747-03MS** Units: **ug/Kg** Analysis Date: **21-Feb-2020 14:53**
Client ID: Run ID: **SV-6_356813** SeqNo: **5483525** PrepDate: **20-Feb-2020** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	98.19	33	166.5	0	59.0	50 - 125				
Surr: 2-Fluorobiphenyl	*78.99*	*0*	*166.5*	*0*	*47.4*	*43 - 125*				
Surr: 4-Terphenyl-d14	*113.2*	*0*	*166.5*	*0*	*68.0*	*32 - 125*				
Surr: Nitrobenzene-d5	*88.58*	*0*	*166.5*	*0*	*53.2*	*37 - 125*				

MSD Sample ID: **HS20020747-03MSD** Units: **ug/Kg** Analysis Date: **21-Feb-2020 15:13**
Client ID: Run ID: **SV-6_356813** SeqNo: **5483526** PrepDate: **20-Feb-2020** DF: **10**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	120.4	33	166.8	0	72.2	50 - 125	98.19	20.3	30	
Surr: 2-Fluorobiphenyl	*105.1*	*0*	*166.8*	*0*	*63.0*	*43 - 125*	*78.99*	*28.4*	*30*	
Surr: 4-Terphenyl-d14	*157.7*	*0*	*166.8*	*0*	*94.6*	*32 - 125*	*113.2*	*32.9*	*30*	R
Surr: Nitrobenzene-d5	*80.46*	*0*	*166.8*	*0*	*48.2*	*37 - 125*	*88.58*	*9.6*	*30*	

The following samples were analyzed in this batch:

HS20020741-01	HS20020741-02	HS20020741-03	HS20020741-04
HS20020741-05	HS20020741-06	HS20020741-07	HS20020741-08

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020741

QC BATCH REPORT

Batch ID: R356625 (0) **Instrument: VOA8** **Method: VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKS1-022020** Units: **ug/Kg** Analysis Date: **20-Feb-2020 08:59**
Client ID: Run ID: **VOA8_356625** SeqNo: **5480014** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	5.0								
Ethylbenzene	U	5.0								
Xylenes, Total	U	5.0								
Surr: 1,2-Dichloroethane-d4	*38.11*	*0*	*50*	*0*	*76.2*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*47.13*	*0*	*50*	*0*	*94.3*	*80 - 120*				
Surr: Dibromofluoromethane	*40.47*	*0*	*50*	*0*	*80.9*	*80 - 119*				
Surr: Toluene-d8	*54.37*	*0*	*50*	*0*	*109*	*81 - 118*				

LCS Sample ID: **VLCSS1-022020** Units: **ug/Kg** Analysis Date: **20-Feb-2020 08:13**
Client ID: Run ID: **VOA8_356625** SeqNo: **5480013** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	51.78	5.0	50	0	104	75 - 124				
Ethylbenzene	58.4	5.0	50	0	117	70 - 123				
Xylenes, Total	167.2	5.0	150	0	111	77 - 128				
Surr: 1,2-Dichloroethane-d4	*41.73*	*0*	*50*	*0*	*83.5*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*48.42*	*0*	*50*	*0*	*96.8*	*80 - 120*				
Surr: Dibromofluoromethane	*43.09*	*0*	*50*	*0*	*86.2*	*80 - 119*				
Surr: Toluene-d8	*54.62*	*0*	*50*	*0*	*109*	*81 - 118*				

MS Sample ID: **HS20020791-01MS** Units: **ug/Kg** Analysis Date: **20-Feb-2020 10:08**
Client ID: Run ID: **VOA8_356625** SeqNo: **5480017** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	42.4	5.0	50	0	84.8	70 - 130				
Ethylbenzene	44.02	5.0	50	0	88.0	70 - 130				
Xylenes, Total	131.4	5.0	150	0	87.6	70 - 130				
Surr: 1,2-Dichloroethane-d4	*43.44*	*0*	*50*	*0*	*86.9*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*46.9*	*0*	*50*	*0*	*93.8*	*70 - 130*				
Surr: Dibromofluoromethane	*45.81*	*0*	*50*	*0*	*91.6*	*70 - 130*				
Surr: Toluene-d8	*49.23*	*0*	*50*	*0*	*98.5*	*70 - 130*				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020741

QC BATCH REPORT

Batch ID: R356625 (0) **Instrument: VOA8** **Method: VOLATILES BY SW8260C**

MSD Sample ID: **HS20020791-01MSD** Units: **ug/Kg** Analysis Date: **20-Feb-2020 10:31**
Client ID: Run ID: **VOA8_356625** SeqNo: **5480018** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	48.19	5.0	50	0	96.4	70 - 130	42.4	12.8	30	
Ethylbenzene	50.92	5.0	50	0	102	70 - 130	44.02	14.5	30	
Xylenes, Total	150.2	5.0	150	0	100	70 - 130	131.4	13.4	30	
Surr: 1,2-Dichloroethane-d4	*42.11*	*0*	*50*	*0*	*84.2*	*70 - 126*	*43.44*	*3.11*	*30*	
Surr: 4-Bromofluorobenzene	*48.87*	*0*	*50*	*0*	*97.7*	*70 - 130*	*46.9*	*4.12*	*30*	
Surr: Dibromofluoromethane	*47.03*	*0*	*50*	*0*	*94.1*	*70 - 130*	*45.81*	*2.61*	*30*	
Surr: Toluene-d8	*53.14*	*0*	*50*	*0*	*106*	*70 - 130*	*49.23*	*7.64*	*30*	

The following samples were analyzed in this batch: HS20020741-01 HS20020741-02 HS20020741-03 HS20020741-04
HS20020741-05 HS20020741-06 HS20020741-07 HS20020741-08

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20020741

QC BATCH REPORT

Batch ID: R356904 (0) **Instrument: Balance1** **Method: MOISTURE - ASTM D2216**

DUP Sample ID: **HS20020770-05DUP** Units: **wt%** Analysis Date: **24-Feb-2020 09:04**
Client ID: Run ID: **Balance1_356904** SeqNo: **5485414** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Percent Moisture	10.4	0.0100					10.4	0	20	

The following samples were analyzed in this batch:

HS20020741-01	HS20020741-02	HS20020741-03	HS20020741-04
HS20020741-05	HS20020741-06	HS20020741-07	HS20020741-08

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: **HS20020741**

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/Kg-dry	Milligrams per Kilogram- Dry weight corrected

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231 V009	22-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

Sample Receipt Checklist

Client Name: PBW
Work Order: HS20020741

Date/Time Received: **18-Feb-2020 17:40**
Received by: **DDG**

Checklist completed by: *Jared R. Makan* eSignature 18-Feb-2020 Date

Reviewed by: *Dane J. Wacasey* eSignature 19-Feb-2020 Date

Matrices: **Soil**

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 ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:214099
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):	0.7°C/0.7°C UC/C	IR25
Cooler(s)/Kit(s):	45571	
Date/Time sample(s) sent to storage:	02/18/2020 18:55	

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: All sample bottle count differ - COC = 5, received 4 bottles.

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 Forr

Page 1 of 1

COC ID: 214099

HS20020741

Golder Associates Inc.
Houston TX-Wood Preserving Works

Customer Information		Project Information		ALS Project Manager:
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works	
Work Order		Project Number	1620-11-Rev0 SR 92688	
Company Name	Golder Associates Inc.	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	B	C	D	E	F	G	H	I	J
A	8260_S (5652652 B,E,X)									
B	8270_LOW_S (5632532 SVOC - Naphthalene only)									
C	MOIST_ASTM (5631931 Gen.Chem. MOIST%)									
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	SG-1620-SG12 (0.5-1) 20200217	2-17-20	0911	Soil	8,9	5	X	X	X								
2	SG12 (5.5-6)		0930														
3	SG07 (0.5-1)		1050														
4	SG07 (5.5-6)		1110														
5	SG06 (0.5-1)		1400														
6	SG06 (5.5-6)		1415														
7	SG14 (0.5-1)		1615														
8	SG14 (5.5-6)		1630														
9																	
10																	

Sampler(s) Please Print & Sign: Anthony Reid

Shipment Method:

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

Results Due Date:

	Date:	Time:	
Relinquished by:	2-18-20	1650	Received by:
Relinquished by:			Received by (Laboratory): DG 02/18/20 17:40
Logged by (Laboratory):			Checked by (Laboratory):

Notes: UPRR HWPW 1620-11

Cooler ID	Cooler Temp.
45571	0-7

QC Package: (Check One Box Below)
[ ] Level II Std QC
[ ] Level III Std QC/Raw Data
[ ] 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.

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

45571

CUSTODY SEAL

Date: 2-18-20 Time: 1820
Name: Anthony Reed
Company: Groundes

Seal Broken By: SM
Date: 02/18/20

45571 FEB 18 2020

Memorandum

July 10, 2020

To:	Eric Matzner	Ref. No.:	11183954-1620
From:	Chris G. Knight/eew/674-NF	Tel:	512-506-8803
cc:	Jesse Orth, Jon Lang; Julie Lidstone		

Subject: **Data Usability Summary**
Soil Gas Probes
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works
Houston, Texas
June 2020

1. Scope of Data Usability Study

This document details a Data Usability Summary (DUS) of analytical results for soil samples collected in support of the Soil Gas Probes at the Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works site during June 2020. Samples were submitted to ALS Environmental (ALS), located in Houston, Texas and are reported in data package HS20060975. The intended use of the data is to support the Soil Gas Probes 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), field quality assurance/quality control samples (QA/QC), 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 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 analyses.

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 exceptions:

i) SG-24(5.5-6) – The sample time on the container labels (15:00) differs from the chain of custody (15:50). The sample was logged in using the sample time listed on the chain of custody. No further action was required.

ii) SG25(0.5-1) – The methanol preserved method 5035 volatile organic compounds (VOCs) container was received empty. No further action was required.

All samples were 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 VOCs and naphthalene 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.

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 methods. 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 relative percent difference (RPD) between the MS and MSD is used to assess analytical precision.

The laboratory performed MS/MSD analyses on non-site samples. These cannot be used to assess accuracy and precision for the site samples.

4.8 Field Procedures

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

4.9 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.

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

All soil results were reported on a dry weight basis.

5. Conclusion

Based on the assessment detailed in the foregoing, the data summarized in Table 2 are usable for the purpose of supporting the Soil Gas Probes at the site by providing current concentration of chemicals of concern in soil samples without qualification.

Table 1

Sample Collection and Analysis Summary
Soil Gas Probes
Union Pacific Railroad (UPRR)/Houston, TX-Wood Preserving Works
Houston, Texas
June 2020

							Analysis/Parameters	
Sample Identification	**Location**	**Matrix**	**Initial Sample Depth (ft bgs)**	**Final Sample Depth (ft bgs)**	**Collection Date (mm/dd/yyyy)**	**Collection Time (hr:min)**	**VOCs**	**Naphthalene**
SO-1620-SG25(0.5-1)20200618	SG-25	Soil	0.5	1	06/18/2020	08:30	X	X
SO-1620-SG25(5.5-6)20200618	SG-25	Soil	5.5	6	06/18/2020	08:58	X	X
SO-1620-SG13R(0.5-1)20200618	SG-13R	Soil	0.5	1	06/18/2020	10:00	X	X
SO-1620-SG13R(5.5-6)20200618	SG-13R	Soil	5.5	6	06/18/2020	10:30	X	X
SO-1620-SG27(5.5-6)20200618	SG-27	Soil	5.5	6	06/18/2020	10:30	X	X
SO-1620-SG23(0.5-1)20200618	SG-23	Soil	0.5	1	06/18/2020	13:08	X	X
SO-1620-SG23(5.5-6)20200618	SG-23	Soil	5.5	6	06/18/2020	13:30	X	X
SO-1620-SG24(0.5-1)20200618	SG-24	Soil	0.5	1	06/18/2020	14:49	X	X
SO-1620-SG24(5.5-6)20200618	SG-24	Soil	5.5	6	06/18/2020	15:50	X	X
SO-1620-SG26(0.5-1)20200619	SG-26	Soil	0.5	1	06/19/2020	09:15	X	X
SO-1620-SG26(5.5-6)20200619	SG-26	Soil	5.5	6	06/19/2020	09:52	X	X
SO-1620-SG27(0.5-1)20200619	SG-27	Soil	0.5	1	06/19/2020	10:10	X	X

Notes:

ft bgs - Feet Below Ground Surface
VOCs - Volatile Organic Compounds

Table 2

Analytical Results Summary
Soil Gas Probes
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works
Houston, Texas
June 2020

Location ID:		**SG-13R**	**SG-13R**	**SG-23**	**SG-23**
Sample Name:		**SO-1620-SG13R(0.5-1)20200618**	**SO-1620-SG13R(5.5-6)20200618**	**SO-1620-SG23(0.5-1)20200618**	**SO-1620-SG23(5.5-6)20200618**
Sample Date:		**06/18/2020**	**06/18/2020**	**06/18/2020**	**06/18/2020**
Depth:		**0.5-1 ft bgs**	**5.5-6 ft bgs**	**0.5-1 ft bgs**	**5.5-6 ft bgs**
Parameters	**Unit**				
Volatile Organic Compounds					
Benzene	mg/kg	<0.00053	<0.00044	<0.00031	<0.00032
Ethylbenzene	mg/kg	<0.00075	<0.00062	<0.00044	<0.00044
Xylenes (total)	mg/kg	<0.0011	<0.00089	<0.00062	<0.00064
Semi-volatile Organic Compounds					
Naphthalene	mg/kg	<0.00074	<0.00073	0.00071 J	<0.00071

Table 2

Analytical Results Summary
Soil Gas Probes
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works
Houston, Texas
June 2020

Location ID:		**SG-24**	**SG-24**	**SG-25**	**SG-25**
Sample Name:		**SO-1620-SG24(0.5-1)20200618**	**SO-1620-SG24(5.5-6)20200618**	**SO-1620-SG25(0.5-1)20200618**	**SO-1620-SG25(5.5-6)20200618**
Sample Date:		**06/18/2020**	**06/18/2020**	**06/18/2020**	**06/18/2020**
Depth:		**0.5-1 ft bgs**	**5.5-6 ft bgs**	**0.5-1 ft bgs**	**5.5-6 ft bgs**
Parameters	**Unit**				
Volatile Organic Compounds					
Benzene	mg/kg	<0.00038	<0.00030	<0.00068	<0.00030
Ethylbenzene	mg/kg	<0.00053	<0.00043	<0.00095	<0.00042
Xylenes (total)	mg/kg	<0.00076	<0.00061	<0.0014	<0.00059
Semi-volatile Organic Compounds					
Naphthalene	mg/kg	0.0010 J	<0.00069	0.0046	<0.00070

Table 2

Analytical Results Summary
Soil Gas Probes
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works
Houston, Texas
June 2020

Location ID:		**SG-26**	**SG-26**	**SG-27**	**SG-27**
Sample Name:		**SO-1620-SG26(0.5-1)20200619**	**SO-1620-SG26(5.5-6)20200619**	**SO-1620-SG27(5.5-6)20200618**	**SO-1620-SG27(0.5-1)20200619**
Sample Date:		**06/19/2020**	**06/19/2020**	**06/18/2020**	**06/19/2020**
Depth:		**0.5-1 ft bgs**	**5.5-6 ft bgs**	**5.5-6 ft bgs**	**0.5-1 ft bgs**
Parameters	**Unit**				
Volatile Organic Compounds					
Benzene	mg/kg	<0.00046	<0.00039	<0.00039	<0.00069
Ethylbenzene	mg/kg	<0.00064	<0.00054	<0.00054	<0.00097
Xylenes (total)	mg/kg	<0.00092	<0.00077	<0.00077	<0.0014
Semi-volatile Organic Compounds					
Naphthalene	mg/kg	0.0039	<0.00069	0.0018 J	0.0022 J

Notes:

ft bgs - Feet below ground surface
< - Not detected at the associated reporting limit
J - Estimated concentration

Table 3

Analytical Methods
Soil Gas Probes
Union Pacific Railroad (UPRR)/Houston, TX-Wood Preserving Works
Houston, Texas
June 2020

			Holding Time	
Parameter	**Method**	**Matrix**	**Collection to Extraction (Days)**	**Extraction to Analysis (Days)**
VOCs	SW-846 8260C	Soil	-	14
Naphthalene	SW-846 8270D	Soil	14	40

Notes:

VOCs - Volatile Organic Compounds
"-" - Not Applicable

Method References:

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

Attachment A
Laboratory NELAP Certificate

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate: T104704231-20-26

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

Expiration Date: 4/30/2021

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

Issue Date: 5/1/2020

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: ***Drinking Water***

Method EPA 1613

Analyte	AB	Analyte ID	Method ID
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	TX	9618	10120408

Method EPA 200.8

Analyte	AB	Analyte ID	Method ID
Copper	TX	1055	10014605
Lead	TX	1075	10014605

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate: T104704231-20-26

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

Expiration Date: 4/30/2021

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

Issue Date: 5/1/2020

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: ***Non-Potable Water***

Method EPA 1010

Analyte	AB	Analyte ID	Method ID
Ignitability	TX	1780	10116606

Method EPA 120.1

Analyte	AB	Analyte ID	Method ID
Conductivity	TX	1610	10006403

Method EPA 1311

Analyte	AB	Analyte ID	Method ID
TCLP	TX	849	10118806

Method EPA 1312

Analyte	AB	Analyte ID	Method ID
SPLP	TX	850	10119003

Method EPA 160.4

Analyte	AB	Analyte ID	Method ID
Residue-volatile	TX	1970	10010409

Method EPA 1613

Analyte	AB	Analyte ID	Method ID
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	TX	9516	10120408
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	TX	9519	10120408
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	TX	9420	10120408
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	TX	9426	10120408
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	TX	9423	10120408
1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-HxCDF)	TX	9471	10120408
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-HxCDD)	TX	9453	10120408
1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-HxCDF)	TX	9474	10120408
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin(1,2,3,6,7,8-HxCDD)	TX	9456	10120408
1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-HxCDF)	TX	9477	10120408
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-HxCDD)	TX	9459	10120408
1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-PeCDF)	TX	9543	10120408
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD)	TX	9540	10120408
2,3,4,6,7,8-Hexachlorodibenzofuran (2,3,4,6,7,8-HxCDF)	TX	9480	10120408

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Issue Date: 5/1/2020

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Matrix: ***Non-Potable Water***

2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF	TX	9549	10120408
2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	TX	9612	10120408
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	TX	9618	10120408
Total Heptachlorodibenzofuran (Total HpCDF)	TX	9444	10120408
Total Heptachlorodibenzo-p-dioxin (Total HpCDD)	TX	9438	10120408
Total Hexachlorodibenzofuran (Total HxCDF)	TX	9483	10120408
Total Hexachlorodibenzo-p-dioxin (Total HxCDD)	TX	9468	10120408
Total Pentachlorodibenzofuran (Total PeCDF)	TX	9552	10120408
Total Pentachlorodibenzo-p-dioxin (Total PeCDD)	TX	9555	10120408
Total Tetrachlorodibenzofuran (Total TCDF)	TX	9615	10120408
Total Tetrachlorodibenzo-p-dioxin (Total TCDD)	TX	9609	10120408

Method EPA 1664

Analyte	**AB**	**Analyte ID**	**Method ID**
n-Hexane Extractable Material (HEM) (O&G)	TX	1803	10127807

Method EPA 180.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Turbidity	TX	2055	10011606

Method EPA 200.8

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	TX	1000	10014605
Antimony	TX	1005	10014605
Arsenic	TX	1010	10014605
Barium	TX	1015	10014605
Beryllium	TX	1020	10014605
Boron	TX	1025	10014605
Cadmium	TX	1030	10014605
Calcium	TX	1035	10014605
Chromium	TX	1040	10014605
Cobalt	TX	1050	10014605
Copper	TX	1055	10014605
Iron	TX	1070	10014605

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Matrix: ***Non-Potable Water***

Lead	TX	1075	10014605
Magnesium	TX	1085	10014605
Manganese	TX	1090	10014605
Molybdenum	TX	1100	10014605
Nickel	TX	1105	10014605
Potassium	TX	1125	10014605
Selenium	TX	1140	10014605
Silver	TX	1150	10014605
Sodium	TX	1155	10014605
Strontium	TX	1160	10014605
Thallium	TX	1165	10014605
Tin	TX	1175	10014605
Titanium	TX	1180	10014605
Uranium	TX	3035	10014605
Vanadium	TX	1185	10014605
Zinc	TX	1190	10014605

Method EPA 245.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10036609

Method EPA 300.0

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	TX	1540	10053200
Chloride	TX	1575	10053200
Fluoride	TX	1730	10053200
Nitrate as N	TX	1810	10053200
Nitrate-nitrite	TX	1820	10053200
Nitrite as N	TX	1840	10053200
Orthophosphate as P	TX	1870	10053200
Sulfate	TX	2000	10053200

Method EPA 325.1

Analyte	**AB**	**Analyte ID**	**Method ID**

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Matrix: ***Non-Potable Water***

Chloride	TX	1575	10056801

Method EPA 335.1

Analyte	AB	Analyte ID	Method ID
Amenable cyanide	TX	1510	10060001

Method EPA 335.2

Analyte	AB	Analyte ID	Method ID
Total cyanide	TX	1645	10278203

Method EPA 335.4

Analyte	AB	Analyte ID	Method ID
Total cyanide	TX	1645	10061402

Method EPA 350.3

Analyte	AB	Analyte ID	Method ID
Ammonia as N	TX	1515	10064401

Method EPA 365.3

Analyte	AB	Analyte ID	Method ID
Orthophosphate as P	TX	1870	10070801
Phosphorus	TX	1910	10070801

Method EPA 375.4

Analyte	AB	Analyte ID	Method ID
Sulfate	TX	2000	10073800

Method EPA 376.1

Analyte	AB	Analyte ID	Method ID
Sulfide	TX	2005	10074201

Method EPA 410.4

Analyte	AB	Analyte ID	Method ID
Chemical oxygen demand (COD)	TX	1565	10077404

Method EPA 415.1

Analyte	AB	Analyte ID	Method ID
Total Organic Carbon (TOC)	TX	2040	10078407

Method EPA 420.1

Analyte	AB	Analyte ID	Method ID
Total phenolics	TX	1905	10079400

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Matrix: ***Non-Potable Water***

Method EPA 420.4

Analyte	AB	Analyte ID	Method ID
Total phenolics	TX	1905	10080203

Method EPA 6020

Analyte	AB	Analyte ID	Method ID
Aluminum	TX	1000	10156419
Antimony	TX	1005	10156419
Arsenic	TX	1010	10156419
Barium	TX	1015	10156419
Beryllium	TX	1020	10156419
Boron	TX	1025	10156419
Cadmium	TX	1030	10156419
Calcium	TX	1035	10156419
Chromium	TX	1040	10156419
Cobalt	TX	1050	10156419
Copper	TX	1055	10156419
Iron	TX	1070	10156419
Lead	TX	1075	10156419
Lithium	TX	1080	10156419
Magnesium	TX	1085	10156419
Manganese	TX	1090	10156419
Molybdenum	TX	1100	10156419
Nickel	TX	1105	10156419
Potassium	TX	1125	10156419
Selenium	TX	1140	10156419
Silver	TX	1150	10156419
Sodium	TX	1155	10156419
Strontium	TX	1160	10156419
Thallium	TX	1165	10156419
Tin	TX	1175	10156419
Titanium	TX	1180	10156419

Matrix: ***Non-Potable Water***

Vanadium	TX	1185	10156419
Zinc	TX	1190	10156419

Method EPA 608

Analyte	AB	Analyte ID	Method ID
4,4'-DDD	TX	7355	10103603
4,4'-DDE	TX	7360	10103603
4,4'-DDT	TX	7365	10103603
Aldrin	TX	7025	10103603
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10103603
alpha-Chlordane	TX	7240	10103603
Aroclor-1016 (PCB-1016)	TX	8880	10103603
Aroclor-1221 (PCB-1221)	TX	8885	10103603
Aroclor-1232 (PCB-1232)	TX	8890	10103603
Aroclor-1242 (PCB-1242)	TX	8895	10103603
Aroclor-1248 (PCB-1248)	TX	8900	10103603
Aroclor-1254 (PCB-1254)	TX	8905	10103603
Aroclor-1260 (PCB-1260)	TX	8910	10103603
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10103603
Chlordane (tech.)	TX	7250	10103603
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10103603
Dieldrin	TX	7470	10103603
Endosulfan I	TX	7510	10103603
Endosulfan II	TX	7515	10103603
Endosulfan sulfate	TX	7520	10103603
Endrin	TX	7540	10103603
Endrin aldehyde	TX	7530	10103603
Endrin ketone	TX	7535	10103603
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10103603
gamma-Chlordane	TX	7245	10103603
Heptachlor	TX	7685	10103603

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Matrix: ***Non-Potable Water***

Heptachlor epoxide	TX	7690	10103603
Methoxychlor	TX	7810	10103603
Toxaphene (Chlorinated camphene)	TX	8250	10103603

Method EPA 624

Analyte	AB	Analyte ID	Method ID
1,1,1-Trichloroethane	TX	5160	10107207
1,1,2,2-Tetrachloroethane	TX	5110	10107207
1,1,2-Trichloroethane	TX	5165	10107207
1,1-Dichloroethane	TX	4630	10107207
1,1-Dichloroethylene	TX	4640	10107207
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10107207
1,2-Dichlorobenzene	TX	4610	10107207
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10107207
1,2-Dichloropropane	TX	4655	10107207
1,3-Dichlorobenzene	TX	4615	10107207
1,4-Dichlorobenzene	TX	4620	10107207
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10107207
2-Chloroethyl vinyl ether	TX	4500	10107207
Acetone (2-Propanone)	TX	4315	10107207
Acrolein (Propenal)	TX	4325	10107207
Acrylonitrile	TX	4340	10107207
Benzene	TX	4375	10107207
Bromodichloromethane	TX	4395	10107207
Bromoform	TX	4400	10107207
Carbon tetrachloride	TX	4455	10107207
Chlorobenzene	TX	4475	10107207
Chlorodibromomethane	TX	4575	10107207
Chloroethane (Ethyl chloride)	TX	4485	10107207
Chloroform	TX	4505	10107207
cis-1,2-Dichloroethylene	TX	4645	10107207

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Matrix: ***Non-Potable Water***

cis-1,3-Dichloropropene	TX	4680	10107207
Ethylbenzene	TX	4765	10107207
m+p-xylene	TX	5240	10107207
Methyl bromide (Bromomethane)	TX	4950	10107207
Methyl chloride (Chloromethane)	TX	4960	10107207
Methyl tert-butyl ether (MTBE)	TX	5000	10107207
Methylene chloride (Dichloromethane)	TX	4975	10107207
Naphthalene	TX	5005	10107207
o-Xylene	TX	5250	10107207
Tetrachloroethylene (Perchloroethylene)	TX	5115	10107207
Toluene	TX	5140	10107207
trans-1,2-Dichloroethylene	TX	4700	10107207
trans-1,3-Dichloropropylene	TX	4685	10107207
Trichloroethene (Trichloroethylene)	TX	5170	10107207
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10107207
Vinyl chloride	TX	5235	10107207
Xylene (total)	TX	5260	10107207

Method EPA 625

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2,4,5-Tetrachlorobenzene	TX	6715	10107401
1,2,4-Trichlorobenzene	TX	5155	10107401
1,2-Dichlorobenzene	TX	4610	10107401
1,2-Diphenylhydrazine	TX	6220	10107401
1,3-Dichlorobenzene	TX	4615	10107401
1,4-Dichlorobenzene	TX	4620	10107401
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10107401
2,4,5-Trichlorophenol	TX	6835	10107401
2,4,6-Trichlorophenol	TX	6840	10107401
2,4-Dichlorophenol	TX	6000	10107401
2,4-Dimethylphenol	TX	6130	10107401

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Matrix: ***Non-Potable Water***

2,4-Dinitrophenol	TX	6175	10107401
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10107401
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10107401
2-Chloronaphthalene	TX	5795	10107401
2-Chlorophenol	TX	5800	10107401
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10107401
2-Methylphenol (o-Cresol)	TX	6400	10107401
2-Nitrophenol	TX	6490	10107401
3,3'-Dichlorobenzidine	TX	5945	10107401
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10107401
4-Chloro-3-methylphenol	TX	5700	10107401
4-Chlorophenyl phenylether	TX	5825	10107401
4-Methylphenol (p-Cresol)	TX	6410	10107401
4-Nitrophenol	TX	6500	10107401
Acenaphthene	TX	5500	10107401
Acenaphthylene	TX	5505	10107401
Anthracene	TX	5555	10107401
Benzidine	TX	5595	10107401
Benzo(a)anthracene	TX	5575	10107401
Benzo(a)pyrene	TX	5580	10107401
Benzo(b)fluoranthene	TX	5585	10107401
Benzo(g,h,i)perylene	TX	5590	10107401
Benzo(k)fluoranthene	TX	5600	10107401
bis(2-Chloroethoxy)methane	TX	5760	10107401
bis(2-Chloroethyl) ether	TX	5765	10107401
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10107401
Butyl benzyl phthalate	TX	5670	10107401
Chrysene	TX	5855	10107401
Dibenz(a,h) anthracene	TX	5895	10107401
Diethyl phthalate	TX	6070	10107401

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Matrix: ***Non-Potable Water***

Dimethyl phthalate	TX	6135	10107401
Di-n-butyl phthalate	TX	5925	10107401
Di-n-octyl phthalate	TX	6200	10107401
Fluoranthene	TX	6265	10107401
Fluorene	TX	6270	10107401
Hexachlorobenzene	TX	6275	10107401
Hexachlorobutadiene	TX	4835	10107401
Hexachlorocyclopentadiene	TX	6285	10107401
Hexachloroethane	TX	4840	10107401
Indeno(1,2,3-cd) pyrene	TX	6315	10107401
Isophorone	TX	6320	10107401
Naphthalene	TX	5005	10107401
Nitrobenzene	TX	5015	10107401
n-Nitrosodiethylamine	TX	6525	10107401
n-Nitrosodimethylamine	TX	6530	10107401
n-Nitrosodi-n-butylamine	TX	5025	10107401
n-Nitrosodi-n-propylamine	TX	6545	10107401
n-Nitrosodiphenylamine	TX	6535	10107401
Pentachlorobenzene	TX	6590	10107401
Pentachlorophenol	TX	6605	10107401
Phenanthrene	TX	6615	10107401
Phenol	TX	6625	10107401
Pyrene	TX	6665	10107401
Pyridine	TX	5095	10107401

Method EPA 7196

Analyte	**AB**	**Analyte ID**	**Method ID**
Chromium (VI)	TX	1045	10162206

Method EPA 7470

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10165603

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Matrix: ***Non-Potable Water***

Method EPA 8011

Analyte	AB	Analyte ID	Method ID
1,2,3-Trichloropropane	TX	5180	10173009
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10173009
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10173009

Method EPA 8015

Analyte	AB	Analyte ID	Method ID
Diesel range organics (DRO)	TX	9369	10173203
Ethanol	TX	4750	10173203
Ethylene glycol	TX	4785	10173203
Gasoline range organics (GRO)	TX	9408	10173203
Isobutyl alcohol (2-Methyl-1-propanol)	TX	4875	10173203
Isopropyl alcohol (2-Propanol, Isopropanol)	TX	4895	10173203
Methanol	TX	4930	10173203
n-Butyl alcohol (1-Butanol, n-Butanol)	TX	4425	10173203
n-Propanol (1-Propanol)	TX	5055	10173203
Propylene Glycol	TX	6657	10173203
tert-Butyl alcohol	TX	4420	10173203

Method EPA 8081

Analyte	AB	Analyte ID	Method ID
4,4'-DDD	TX	7355	10178402
4,4'-DDE	TX	7360	10178402
4,4'-DDT	TX	7365	10178402
Aldrin	TX	7025	10178402
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10178402
alpha-Chlordane	TX	7240	10178402
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10178402
Chlordane (tech.)	TX	7250	10178402
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10178402
Dieldrin	TX	7470	10178402
Endosulfan I	TX	7510	10178402

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Matrix: ***Non-Potable Water***

Endosulfan II	TX	7515	10178402
Endosulfan sulfate	TX	7520	10178402
Endrin	TX	7540	10178402
Endrin aldehyde	TX	7530	10178402
Endrin ketone	TX	7535	10178402
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10178402
gamma-Chlordane	TX	7245	10178402
Heptachlor	TX	7685	10178402
Heptachlor epoxide	TX	7690	10178402
Hexachlorobenzene	TX	6275	10178402
Methoxychlor	TX	7810	10178402
Mirex	TX	7870	10178402
Toxaphene (Chlorinated camphene)	TX	8250	10178402

Method EPA 8082

Analyte	**AB**	**Analyte ID**	**Method ID**
Aroclor-1016 (PCB-1016)	TX	8880	10179201
Aroclor-1221 (PCB-1221)	TX	8885	10179201
Aroclor-1232 (PCB-1232)	TX	8890	10179201
Aroclor-1242 (PCB-1242)	TX	8895	10179201
Aroclor-1248 (PCB-1248)	TX	8900	10179201
Aroclor-1254 (PCB-1254)	TX	8905	10179201
Aroclor-1260 (PCB-1260)	TX	8910	10179201
PCBs (total)	TX	8870	10179201

Method EPA 8151

Analyte	**AB**	**Analyte ID**	**Method ID**
2,4,5-T	TX	8655	10183003
2,4-D	TX	8545	10183003
2,4-DB	TX	8560	10183003
Dalapon	TX	8555	10183003
Dicamba	TX	8595	10183003
Dichloroprop (Dichlorprop, Weedone)	TX	8605	10183003

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Matrix: ***Non-Potable Water***

Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	TX	8620	10183003
MCPA	TX	7775	10183003
MCPP	TX	7780	10183003
Silvex (2,4,5-TP)	TX	8650	10183003

Method EPA 8260

Analyte	AB	Analyte ID	Method ID
1,1,1,2-Tetrachloroethane	TX	5105	10184404
1,1,1-Trichloroethane	TX	5160	10184404
1,1,2,2-Tetrachloroethane	TX	5110	10184404
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	TX	5195	10184404
1,1,2-Trichloroethane	TX	5165	10184404
1,1-Dichloroethane	TX	4630	10184404
1,1-Dichloroethylene	TX	4640	10184404
1,1-Dichloropropene	TX	4670	10184404
1,2,3-Trichlorobenzene	TX	5150	10184404
1,2,3-Trichloropropane	TX	5180	10184404
1,2,4-Trichlorobenzene	TX	5155	10184404
1,2,4-Trimethylbenzene	TX	5210	10184404
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10184404
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10184404
1,2-Dichlorobenzene	TX	4610	10184404
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10184404
1,2-Dichloropropane	TX	4655	10184404
1,3,5-Trimethylbenzene	TX	5215	10184404
1,3-Dichlorobenzene	TX	4615	10184404
1,3-Dichloropropane	TX	4660	10184404
1,4-Dichlorobenzene	TX	4620	10184404
1,4-Dioxane (1,4-Diethyleneoxide)	TX	4735	10184404
1-Chlorohexane	TX	4510	10184404
1-Propanol	TX	5060	10184404

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

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

Expiration Date: 4/30/2021

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

Issue Date: 5/1/2020

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Matrix: ***Non-Potable Water***

2,2-Dichloropropane	TX	4665	10184404
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10184404
2-Chloroethyl vinyl ether	TX	4500	10184404
2-Chlorotoluene	TX	4535	10184404
2-Hexanone (MBK)	TX	4860	10184404
2-Pentanone	TX	5045	10184404
4-Chlorotoluene	TX	4540	10184404
4-Isopropyltoluene (p-Cymene)	TX	4915	10184404
4-Methyl-2-pentanone (MIBK)	TX	4995	10184404
Acetone (2-Propanone)	TX	4315	10184404
Acetonitrile	TX	4320	10184404
Acrolein (Propenal)	TX	4325	10184404
Acrylonitrile	TX	4340	10184404
Allyl alcohol	TX	4350	10184404
Allyl chloride (3-Chloropropene)	TX	4355	10184404
Benzene	TX	4375	10184404
Benzyl chloride	TX	5635	10184404
Bromobenzene	TX	4385	10184404
Bromochloromethane	TX	4390	10184404
Bromodichloromethane	TX	4395	10184404
Bromoform	TX	4400	10184404
Carbon disulfide	TX	4450	10184404
Carbon tetrachloride	TX	4455	10184404
Chlorobenzene	TX	4475	10184404
Chlorodibromomethane	TX	4575	10184404
Chloroethane (Ethyl chloride)	TX	4485	10184404
Chloroform	TX	4505	10184404
Chloroprene (2-Chloro-1,3-butadiene)	TX	4525	10184404
cis-1,2-Dichloroethylene	TX	4645	10184404
cis-1,3-Dichloropropene	TX	4680	10184404

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Matrix: ***Non-Potable Water***

Dibromofluoromethane	TX	4590	10184404
Dibromomethane (Methylene bromide)	TX	4595	10184404
Dichlorodifluoromethane (Freon-12)	TX	4625	10184404
Diethyl ether	TX	4725	10184404
Di-isopropylether (DIPE)	TX	9375	10184404
Epichlorohydrin (1-Chloro-2,3-epoxypropane)	TX	4745	10184404
Ethanol	TX	4750	10184404
Ethyl acetate	TX	4755	10184404
Ethyl methacrylate	TX	4810	10184404
Ethylbenzene	TX	4765	10184404
Ethyl-t-butylether (ETBE) (2-Ethoxy-2-methylpropane)	TX	4770	10184404
Hexachlorobutadiene	TX	4835	10184404
Iodomethane (Methyl iodide)	TX	4870	10184404
Isobutyl alcohol (2-Methyl-1-propanol)	TX	4875	10184404
Isopropyl alcohol (2-Propanol, Isopropanol)	TX	4895	10184404
Isopropylbenzene (Cumene)	TX	4900	10184404
m+p-xylene	TX	5240	10184404
Methacrylonitrile	TX	4925	10184404
Methyl acetate	TX	4940	10184404
Methyl acrylate	TX	4945	10184404
Methyl bromide (Bromomethane)	TX	4950	10184404
Methyl chloride (Chloromethane)	TX	4960	10184404
Methyl methacrylate	TX	4990	10184404
Methyl tert-butyl ether (MTBE)	TX	5000	10184404
Methylcyclohexane	TX	4965	10184404
Methylene chloride (Dichloromethane)	TX	4975	10184404
Naphthalene	TX	5005	10184404
n-Butyl alcohol (1-Butanol, n-Butanol)	TX	4425	10184404
n-Butylbenzene	TX	4435	10184404
n-Propylbenzene	TX	5090	10184404

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Matrix: ***Non-Potable Water***

o-Xylene	TX	5250	10184404
Propionitrile (Ethyl cyanide)	TX	5080	10184404
Pyridine	TX	5095	10184404
sec-Butylbenzene	TX	4440	10184404
Styrene	TX	5100	10184404
T-amylmethylether (TAME)	TX	4370	10184404
tert-Butyl alcohol	TX	4420	10184404
tert-Butylbenzene	TX	4445	10184404
Tetrachloroethylene (Perchloroethylene)	TX	5115	10184404
Toluene	TX	5140	10184404
trans-1,2-Dichloroethylene	TX	4700	10184404
trans-1,3-Dichloropropylene	TX	4685	10184404
trans-1,4-Dichloro-2-butene	TX	4605	10184404
Trichloroethene (Trichloroethylene)	TX	5170	10184404
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10184404
Vinyl acetate	TX	5225	10184404
Vinyl chloride	TX	5235	10184404
Xylene (total)	TX	5260	10184404

Method EPA 8270

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2,4,5-Tetrachlorobenzene	TX	6715	10185203
1,2,4-Trichlorobenzene	TX	5155	10185203
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10185203
1,2-Dichlorobenzene	TX	4610	10185203
1,2-Dinitrobenzene	TX	6155	10185203
1,2-Diphenylhydrazine	TX	6220	10185203
1,3,5-Trinitrobenzene (1,3,5-TNB)	TX	6885	10185203
1,3-Dichlorobenzene	TX	4615	10185203
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10185203
1,4-Dichlorobenzene	TX	4620	10185203

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Matrix: ***Non-Potable Water***

1,4-Dinitrobenzene	TX	6165	10185203
1,4-Naphthoquinone	TX	6420	10185203
1,4-Phenylenediamine	TX	6630	10185203
1-Chloronaphthalene	TX	5790	10185203
1-Naphthylamine	TX	6425	10185203
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10185203
2,3,4,6-Tetrachlorophenol	TX	6735	10185203
2,4,5-Trichlorophenol	TX	6835	10185203
2,4,5-Trimethylaniline	TX	6880	10185203
2,4,6-Trichlorophenol	TX	6840	10185203
2,4-Diaminotoluene	TX	5880	10185203
2,4-Dichlorophenol	TX	6000	10185203
2,4-Dimethylphenol	TX	6130	10185203
2,4-Dinitrophenol	TX	6175	10185203
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10185203
2,6-Dichlorophenol	TX	6005	10185203
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10185203
2-Acetylaminofluorene	TX	5515	10185203
2-Chloronaphthalene	TX	5795	10185203
2-Chlorophenol	TX	5800	10185203
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10185203
2-Methylaniline (o-Toluidine)	TX	5145	10185203
2-Methylnaphthalene	TX	6385	10185203
2-Methylphenol (o-Cresol)	TX	6400	10185203
2-Naphthylamine	TX	6430	10185203
2-Nitroaniline	TX	6460	10185203
2-Nitrophenol	TX	6490	10185203
2-Picoline (2-Methylpyridine)	TX	5050	10185203
3,3'-Dichlorobenzidine	TX	5945	10185203
3,3'-Dimethylbenzidine	TX	6120	10185203

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Matrix: ***Non-Potable Water***

3-Methylcholanthrene	TX	6355	10185203
3-Methylphenol (m-Cresol)	TX	6405	10185203
3-Nitroaniline	TX	6465	10185203
4-Aminobiphenyl	TX	5540	10185203
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10185203
4-Chloro-3-methylphenol	TX	5700	10185203
4-Chloroaniline	TX	5745	10185203
4-Chlorophenyl phenylether	TX	5825	10185203
4-Dimethyl aminoazobenzene	TX	6105	10185203
4-Methylphenol (p-Cresol)	TX	6410	10185203
4-Nitroaniline	TX	6470	10185203
4-Nitrobiphenyl	TX	6480	10185203
4-Nitrophenol	TX	6500	10185203
4-Nitroquinoline-1-oxide	TX	6510	10185203
5-Chloro-2-methylaniline	TX	5695	10185203
5-Nitro-o-toluidine	TX	6570	10185203
7,12-Dimethylbenz(a) anthracene	TX	6115	10185203
a-a-Dimethylphenethylamine	TX	6125	10185203
Acenaphthene	TX	5500	10185203
Acenaphthylene	TX	5505	10185203
Acetophenone	TX	5510	10185203
Aniline	TX	5545	10185203
Anthracene	TX	5555	10185203
Aramite	TX	5560	10185203
Atrazine	TX	7065	10185203
Azinphos-methyl (Guthion)	TX	7075	10185203
Azobenzene	TX	5562	10185203
Benzenethiol (Thiophenol)	TX	6750	10185203
Benzidine	TX	5595	10185203
Benzo(a)anthracene	TX	5575	10185203

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Matrix: ***Non-Potable Water***

Benzo(a)pyrene	TX	5580	10185203
Benzo(b)fluoranthene	TX	5585	10185203
Benzo(e)pyrene	TX	5605	10185203
Benzo(g,h,i)perylene	TX	5590	10185203
Benzo(k)fluoranthene	TX	5600	10185203
Benzoic acid	TX	5610	10185203
Benzyl alcohol	TX	5630	10185203
Biphenyl	TX	5640	10185203
bis(2-Chloroethoxy)methane	TX	5760	10185203
bis(2-Chloroethyl) ether	TX	5765	10185203
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10185203
Butyl benzyl phthalate	TX	5670	10185203
Caprolactam	TX	7180	10185203
Captan	TX	7190	10185203
Carbaryl (Sevin)	TX	7195	10185203
Carbazole	TX	5680	10185203
Carbophenothion	TX	7220	10185203
Chlorobenzilate	TX	7260	10185203
Chrysene	TX	5855	10185203
Coumaphos	TX	7315	10185203
Demeton	TX	7390	10185203
Demeton	TX	7390	10185203
Demeton-o	TX	7395	10185203
Demeton-s	TX	7385	10185203
Diallate	TX	7405	10185203
Dibenz(a,h) anthracene	TX	5895	10185203
Dibenz(a,j) acridine	TX	5900	10185203
Dibenzofuran	TX	5905	10185203
Dichlorovos (DDVP, Dichlorvos)	TX	8610	10185203
Diethyl phthalate	TX	6070	10185203

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Matrix: ***Non-Potable Water***

Dimethoate	TX	7475	10185203
Dimethoate	TX	7475	10185203
Dimethyl phthalate	TX	6135	10185203
Di-n-butyl phthalate	TX	5925	10185203
Di-n-octyl phthalate	TX	6200	10185203
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	TX	8620	10185203
Dioxathion	TX	7495	10185203
Diphenylamine	TX	6205	10185203
Disulfoton	TX	8625	10185203
Ethion	TX	7565	10185203
Ethyl methanesulfonate	TX	6260	10185203
Famphur	TX	7580	10185203
Fluoranthene	TX	6265	10185203
Fluorene	TX	6270	10185203
Hexachlorobenzene	TX	6275	10185203
Hexachlorobutadiene	TX	4835	10185203
Hexachlorocyclopentadiene	TX	6285	10185203
Hexachloroethane	TX	4840	10185203
Hexachlorophene	TX	6290	10185203
Hexachloropropene	TX	6295	10185203
Indeno(1,2,3-cd) pyrene	TX	6315	10185203
Isodrin	TX	7725	10185203
Isophorone	TX	6320	10185203
Isosafrole	TX	6325	10185203
Kepone	TX	7740	10185203
Maleic anhydride	TX	6335	10185203
Methapyrilene	TX	6345	10185203
Methyl methanesulfonate	TX	6375	10185203
Methyl parathion (Parathion, methyl)	TX	7825	10185203
Mevinphos	TX	7850	10185203

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Matrix: ***Non-Potable Water***

Naled	TX	7905	10185203
Naphthalene	TX	5005	10185203
Nitrobenzene	TX	5015	10185203
n-Nitrosodiethylamine	TX	6525	10185203
n-Nitrosodimethylamine	TX	6530	10185203
n-Nitrosodi-n-butylamine	TX	5025	10185203
n-Nitrosodi-n-propylamine	TX	6545	10185203
n-Nitrosodiphenylamine	TX	6535	10185203
n-Nitrosomethylethylamine	TX	6550	10185203
n-Nitrosomorpholine	TX	6555	10185203
n-Nitrosopiperidine	TX	6560	10185203
n-Nitrosopyrrolidine	TX	6565	10185203
o,o,o-Triethyl phosphorothioate	TX	8290	10185203
o-Anisidine	TX	5550	10185203
Parathion, ethyl	TX	7955	10185203
p-Cresidine	TX	5860	10185203
Pentachlorobenzene	TX	6590	10185203
Pentachloronitrobenzene (PCNB)	TX	6600	10185203
Pentachlorophenol	TX	6605	10185203
Phenacetin	TX	6610	10185203
Phenanthrene	TX	6615	10185203
Phenol	TX	6625	10185203
Phorate	TX	7985	10185203
Phosmet (Imidan)	TX	8000	10185203
Phthalic anhydride	TX	6640	10185203
Pronamide (Kerb)	TX	6650	10185203
Pyrene	TX	6665	10185203
Pyridine	TX	5095	10185203
Quinoline	TX	6670	10185203
Resorcinol	TX	6680	10185203

Safrole	TX	6685	10185203
Sulfotepp	TX	8155	10185203
Terbufos	TX	8185	10185203
Tetrachlorvinphos (Stirophos, Gardona)	TX	8197	10185203
Thionazin (Zinophos)	TX	8235	10185203
Toluene diisocyanate	TX	6775	10185203
Trifluralin (Treflan)	TX	8295	10185203

Method EPA 8290

Analyte	AB	Analyte ID	Method ID
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	TX	9516	10187209
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	TX	9519	10187209
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	TX	9420	10187209
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	TX	9426	10187209
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	TX	9423	10187209
1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-HxCDF)	TX	9471	10187209
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-HxCDD)	TX	9453	10187209
1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-HxCDF)	TX	9474	10187209
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin(1,2,3,6,7,8-HxCDD)	TX	9456	10187209
1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-HxCDF)	TX	9477	10187209
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-HxCDD)	TX	9459	10187209
1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-PeCDF)	TX	9543	10187209
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD)	TX	9540	10187209
2,3,4,6,7,8-Hexachlorodibenzofuran (2,3,4,6,7,8-HxCDF)	TX	9480	10187209
2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF	TX	9549	10187209
2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	TX	9612	10187209
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	TX	9618	10187209
Total Heptachlorodibenzofuran (Total HpCDF)	TX	9444	10187209
Total Heptachlorodibenzo-p-dioxin (Total HpCDD)	TX	9438	10187209
Total Hexachlorodibenzofuran (Total HxCDF)	TX	9483	10187209
Total Hexachlorodibenzo-p-dioxin (Total HxCDD)	TX	9468	10187209

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Matrix: ***Non-Potable Water***

Total Pentachlorodibenzofuran (Total PeCDF)	TX	9552	10187209
Total Pentachlorodibenzo-p-dioxin (Total PeCDD)	TX	9555	10187209
Total Tetrachlorodibenzofuran (Total TCDF)	TX	9615	10187209
Total Tetrachlorodibenzo-p-dioxin (Total TCDD)	TX	9609	10187209

Method EPA 8316

Analyte	**AB**	**Analyte ID**	**Method ID**
Acrylamide	TX	4330	10188202

Method EPA 8330

Analyte	**AB**	**Analyte ID**	**Method ID**
1,3,5-Trinitrobenzene (1,3,5-TNB)	TX	6885	10189807
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10189807
2,4,6-Trinitrotoluene (2,4,6-TNT)	TX	9651	10189807
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10189807
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10189807
2-Amino-4,6-dinitrotoluene (2-am-dnt)	TX	9303	10189807
2-Nitrotoluene	TX	9507	10189807
3-Nitrotoluene	TX	9510	10189807
4-Amino-2,6-dinitrotoluene (4-am-dnt)	TX	9306	10189807
4-Nitrotoluene	TX	9513	10189807
Methyl-2,4,6-trinitrophenylnitramine (tetryl)	TX	6415	10189807
Nitrobenzene	TX	5015	10189807
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	TX	9522	10189807
RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine)	TX	9432	10189807

Method EPA 9014

Analyte	**AB**	**Analyte ID**	**Method ID**
Amenable cyanide	TX	1510	10193803
Total cyanide	TX	1645	10193803

Method EPA 9038

Analyte	**AB**	**Analyte ID**	**Method ID**
Sulfate	TX	2000	10196608

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Matrix: ***Non-Potable Water***

Method EPA 9040

Analyte	AB	Analyte ID	Method ID
pH	TX	1900	10196802

Method EPA 9050

Analyte	AB	Analyte ID	Method ID
Conductivity	TX	1610	10198604

Method EPA 9056

Analyte	AB	Analyte ID	Method ID
Bromide	TX	1540	10199209
Chloride	TX	1575	10199209
Fluoride	TX	1730	10199209
Nitrate as N	TX	1810	10199209
Nitrate-nitrite	TX	1820	10199209
Nitrite as N	TX	1840	10199209
Orthophosphate as P	TX	1870	10199209
Sulfate	TX	2000	10199209

Method EPA 9060

Analyte	AB	Analyte ID	Method ID
Total Organic Carbon (TOC)	TX	2040	10200201

Method EPA 9065

Analyte	AB	Analyte ID	Method ID
Total phenolics	TX	1905	10200405

Method EPA 9066

Analyte	AB	Analyte ID	Method ID
Total phenolics	TX	1905	10200609

Method EPA 9250

Analyte	AB	Analyte ID	Method ID
Chloride	TX	1575	10207202

Method EPA RSK 175

Analyte	AB	Analyte ID	Method ID
2-methylpropane (Isobutane)	TX	4942	10212905

Matrix: ***Non-Potable Water***

Ethane	TX	4747	10212905
Ethene	TX	4752	10212905
Methane	TX	4926	10212905
n-Butane	TX	5007	10212905
n-Propane	TX	5029	10212905

Method HACH 8000

Analyte	**AB**	**Analyte ID**	**Method ID**
Chemical oxygen demand (COD)	TX	1565	60003001

Method SM 2120 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Color	TX	1605	20223807

Method SM 2310 B (4a)

Analyte	**AB**	**Analyte ID**	**Method ID**
Acidity, as CaCO3	TX	1500	20002806

Method SM 2320 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Alkalinity as CaCO3	TX	1505	20045005

Method SM 2340 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Total hardness as CaCO3	TX	1755	20046008

Method SM 2510 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Conductivity	TX	1610	20048004

Method SM 2540 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-total (total solids)	TX	1950	20004608

Method SM 2540 C

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-filterable (TDS)	TX	1955	20049803

Method SM 2540 D

Analyte	**AB**	**Analyte ID**	**Method ID**

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Matrix: ***Non-Potable Water***

Residue-nonfilterable (TSS)	TX	1960	20004802

Method SM 3500-Cr B

Analyte	**AB**	**Analyte ID**	**Method ID**
Chromium (VI)	TX	1045	20065809

Method SM 4500-Cl F

Analyte	**AB**	**Analyte ID**	**Method ID**
Total residual chlorine	TX	1940	20080482

Method SM 4500-Cl⁻ E

Analyte	**AB**	**Analyte ID**	**Method ID**
Chloride	TX	1575	20019209

Method SM 4500-CN⁻ C

Analyte	**AB**	**Analyte ID**	**Method ID**
Total cyanide	TX	1645	20020808

Method SM 4500-CN⁻ E

Analyte	**AB**	**Analyte ID**	**Method ID**
Total cyanide	TX	1645	20021209

Method SM 4500-CN⁻ G

Analyte	**AB**	**Analyte ID**	**Method ID**
Amenable cyanide	TX	1510	20021607

Method SM 4500-H+ B

Analyte	**AB**	**Analyte ID**	**Method ID**
pH	TX	1900	20104603

Method SM 4500-NH3 D

Analyte	**AB**	**Analyte ID**	**Method ID**
Ammonia as N	TX	1515	20108809
Kjeldahl Nitrogen (Total Kjeldahl Nitrogen-TKN)	TX	1790	20108809

Method SM 4500-NH3 F

Analyte	**AB**	**Analyte ID**	**Method ID**
Ammonia as N	TX	1515	20023001

Method SM 4500-O G

Analyte	**AB**	**Analyte ID**	**Method ID**
Oxygen, dissolved	TX	1880	20025405

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Matrix: ***Non-Potable Water***

Method SM 4500-P E

Analyte	AB	Analyte ID	Method ID
Orthophosphate as P	TX	1870	20025803
Phosphorus	TX	1910	20025803

Method SM 4500-$S2^{-}$ D

Analyte	AB	Analyte ID	Method ID
Sulfide	TX	2005	20125400

Method SM 4500-$S2^{-}$ F

Analyte	AB	Analyte ID	Method ID
Sulfide	TX	2005	20126209

Method SM 4500-SiO2 D

Analyte	AB	Analyte ID	Method ID
Silica as SiO2	TX	1990	20127202

Method SM 4500-$SO3^{-}$ B

Analyte	AB	Analyte ID	Method ID
Sulfite	TX	2015	20026806

Method SM 5210 B

Analyte	AB	Analyte ID	Method ID
Biochemical oxygen demand (BOD)	TX	1530	20027401
Carbonaceous BOD, CBOD	TX	1555	20027401

Method SM 5310 B

Analyte	AB	Analyte ID	Method ID
Total Organic Carbon (TOC)	TX	2040	20137206

Method SM 5310 C

Analyte	AB	Analyte ID	Method ID
Total Organic Carbon (TOC)	TX	2040	20138209

Method SM 5540 C

Analyte	AB	Analyte ID	Method ID
Surfactants - MBAS	TX	2025	20144405

Method TCEQ 1005

Analyte	AB	Analyte ID	Method ID
Total Petroleum Hydrocarbons (TPH)	TX	2050	90019208

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Matrix: ***Solid & Chemical Materials***

Method ASTM D2216

Analyte	AB	Analyte ID	Method ID
Moisture	TX	10337	ASTM D2216-05

Method EPA 1010

Analyte	AB	Analyte ID	Method ID
Ignitability	TX	1780	10116606

Method EPA 1030

Analyte	AB	Analyte ID	Method ID
Ignitability	TX	1780	10117201

Method EPA 1311

Analyte	AB	Analyte ID	Method ID
TCLP	TX	849	10118806

Method EPA 1312

Analyte	AB	Analyte ID	Method ID
SPLP	TX	850	10119003

Method EPA 200.8

Analyte	AB	Analyte ID	Method ID
Uranium	TX	3035	10014605

Method EPA 300.0

Analyte	AB	Analyte ID	Method ID
Bromide	TX	1540	10053200
Chloride	TX	1575	10053200
Fluoride	TX	1730	10053200
Nitrate as N	TX	1810	10053200
Nitrate-nitrite	TX	1820	10053200
Nitrite as N	TX	1840	10053200
Orthophosphate as P	TX	1870	10053200
Sulfate	TX	2000	10053200

Method EPA 310.1

Analyte	AB	Analyte ID	Method ID
Alkalinity as CaCO3	TX	1505	10054805

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Matrix: ***Solid & Chemical Materials***

Method EPA 350.3

Analyte	AB	Analyte ID	Method ID
Ammonia as N	TX	1515	10064401

Method EPA 365.3

Analyte	AB	Analyte ID	Method ID
Orthophosphate as P	TX	1870	10070801
Phosphorus	TX	1910	10070801

Method EPA 6020

Analyte	AB	Analyte ID	Method ID
Aluminum	TX	1000	10156204
Antimony	TX	1005	10156204
Arsenic	TX	1010	10156204
Barium	TX	1015	10156204
Beryllium	TX	1020	10156204
Boron	TX	1025	10156204
Cadmium	TX	1030	10156204
Calcium	TX	1035	10156204
Chromium	TX	1040	10156204
Cobalt	TX	1050	10156204
Copper	TX	1055	10156204
Iron	TX	1070	10156204
Lead	TX	1075	10156204
Lithium	TX	1080	10156204
Magnesium	TX	1085	10156204
Manganese	TX	1090	10156204
Molybdenum	TX	1100	10156204
Nickel	TX	1105	10156204
Potassium	TX	1125	10156204
Selenium	TX	1140	10156204
Silver	TX	1150	10156204
Sodium	TX	1155	10156204

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Matrix: ***Solid & Chemical Materials***

Strontium	TX	1160	10156204
Thallium	TX	1165	10156204
Tin	TX	1175	10156204
Titanium	TX	1180	10156204
Vanadium	TX	1185	10156204
Zinc	TX	1190	10156204

Method EPA 7196

Analyte	**AB**	**Analyte ID**	**Method ID**
Chromium (VI)	TX	1045	10162206

Method EPA 7470

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10165603

Method EPA 7471

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10166004

Method EPA 8015

Analyte	**AB**	**Analyte ID**	**Method ID**
Diesel range organics (DRO)	TX	9369	10173203
Ethanol	TX	4750	10173203
Ethylene glycol	TX	4785	10173203
Gasoline range organics (GRO)	TX	9408	10173203
Isobutyl alcohol (2-Methyl-1-propanol)	TX	4875	10173203
Isopropyl alcohol (2-Propanol, Isopropanol)	TX	4895	10173203
Methanol	TX	4930	10173203
n-Butyl alcohol (1-Butanol, n-Butanol)	TX	4425	10173203
n-Propanol (1-Propanol)	TX	5055	10173203
Propylene Glycol	TX	6657	10173203
tert-Butyl alcohol	TX	4420	10173203

Method EPA 8081

Analyte	**AB**	**Analyte ID**	**Method ID**
4,4'-DDD	TX	7355	10178402

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Matrix: ***Solid & Chemical Materials***

4,4'-DDE	TX	7360	10178402
4,4'-DDT	TX	7365	10178402
Aldrin	TX	7025	10178402
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10178402
alpha-Chlordane	TX	7240	10178402
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10178402
Chlordane (tech.)	TX	7250	10178402
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10178402
Dieldrin	TX	7470	10178402
Endosulfan I	TX	7510	10178402
Endosulfan II	TX	7515	10178402
Endosulfan sulfate	TX	7520	10178402
Endrin	TX	7540	10178402
Endrin aldehyde	TX	7530	10178402
Endrin ketone	TX	7535	10178402
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10178402
gamma-Chlordane	TX	7245	10178402
Heptachlor	TX	7685	10178402
Heptachlor epoxide	TX	7690	10178402
Methoxychlor	TX	7810	10178402
Mirex	TX	7870	10178402
Toxaphene (Chlorinated camphene)	TX	8250	10178402

Method EPA 8082

Analyte	**AB**	**Analyte ID**	**Method ID**
Aroclor-1016 (PCB-1016)	TX	8880	10179201
Aroclor-1221 (PCB-1221)	TX	8885	10179201
Aroclor-1232 (PCB-1232)	TX	8890	10179201
Aroclor-1242 (PCB-1242)	TX	8895	10179201
Aroclor-1248 (PCB-1248)	TX	8900	10179201
Aroclor-1254 (PCB-1254)	TX	8905	10179201

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Matrix: ***Solid & Chemical Materials***

Aroclor-1260 (PCB-1260)	TX	8910	10179201
PCBs (total)	TX	8870	10179201

Method EPA 8260

Analyte	AB	Analyte ID	Method ID
1,1,1,2-Tetrachloroethane	TX	5105	10184404
1,1,1-Trichloroethane	TX	5160	10184404
1,1,2,2-Tetrachloroethane	TX	5110	10184404
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	TX	5195	10184404
1,1,2-Trichloroethane	TX	5165	10184404
1,1-Dichloroethane	TX	4630	10184404
1,1-Dichloroethylene	TX	4640	10184404
1,1-Dichloropropene	TX	4670	10184404
1,2,3-Trichlorobenzene	TX	5150	10184404
1,2,3-Trichloropropane	TX	5180	10184404
1,2,4-Trichlorobenzene	TX	5155	10184404
1,2,4-Trimethylbenzene	TX	5210	10184404
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10184404
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10184404
1,2-Dichlorobenzene	TX	4610	10184404
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10184404
1,2-Dichloropropane	TX	4655	10184404
1,3,5-Trimethylbenzene	TX	5215	10184404
1,3-Dichlorobenzene	TX	4615	10184404
1,3-Dichloropropane	TX	4660	10184404
1,4-Dichlorobenzene	TX	4620	10184404
1,4-Dioxane (1,4-Diethyleneoxide)	TX	4735	10184404
1-Chlorohexane	TX	4510	10184404
1-Propanol	TX	5060	10184404
2,2-Dichloropropane	TX	4665	10184404
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10184404

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Matrix: ***Solid & Chemical Materials***

2-Chloroethyl vinyl ether	TX	4500	10184404
2-Chlorotoluene	TX	4535	10184404
2-Hexanone (MBK)	TX	4860	10184404
4-Chlorotoluene	TX	4540	10184404
4-Isopropyltoluene (p-Cymene)	TX	4915	10184404
4-Methyl-2-pentanone (MIBK)	TX	4995	10184404
Acetone (2-Propanone)	TX	4315	10184404
Acetonitrile	TX	4320	10184404
Acrolein (Propenal)	TX	4325	10184404
Acrylonitrile	TX	4340	10184404
Allyl chloride (3-Chloropropene)	TX	4355	10184404
Benzene	TX	4375	10184404
Benzyl chloride	TX	5635	10184404
Bromobenzene	TX	4385	10184404
Bromochloromethane	TX	4390	10184404
Bromodichloromethane	TX	4395	10184404
Bromoform	TX	4400	10184404
Carbon disulfide	TX	4450	10184404
Carbon tetrachloride	TX	4455	10184404
Chlorobenzene	TX	4475	10184404
Chlorodibromomethane	TX	4575	10184404
Chloroethane (Ethyl chloride)	TX	4485	10184404
Chloroform	TX	4505	10184404
Chloroprene (2-Chloro-1,3-butadiene)	TX	4525	10184404
cis-1,2-Dichloroethylene	TX	4645	10184404
cis-1,3-Dichloropropene	TX	4680	10184404
Dibromofluoromethane	TX	4590	10184404
Dibromomethane (Methylene bromide)	TX	4595	10184404
Dichlorodifluoromethane (Freon-12)	TX	4625	10184404
Diethyl ether	TX	4725	10184404

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Matrix: ***Solid & Chemical Materials***

Epichlorohydrin (1-Chloro-2,3-epoxypropane)	TX	4745	10184404
Ethanol	TX	4750	10184404
Ethyl acetate	TX	4755	10184404
Ethyl methacrylate	TX	4810	10184404
Ethylbenzene	TX	4765	10184404
Ethylene oxide	TX	4795	10184404
Hexachlorobutadiene	TX	4835	10184404
Iodomethane (Methyl iodide)	TX	4870	10184404
Isobutyl alcohol (2-Methyl-1-propanol)	TX	4875	10184404
Isopropyl alcohol (2-Propanol, Isopropanol)	TX	4895	10184404
Isopropylbenzene (Cumene)	TX	4900	10184404
m+p-xylene	TX	5240	10184404
Methacrylonitrile	TX	4925	10184404
Methyl acetate	TX	4940	10184404
Methyl acrylate	TX	4945	10184404
Methyl bromide (Bromomethane)	TX	4950	10184404
Methyl chloride (Chloromethane)	TX	4960	10184404
Methyl methacrylate	TX	4990	10184404
Methyl tert-butyl ether (MTBE)	TX	5000	10184404
Methylcyclohexane	TX	4965	10184404
Methylene chloride (Dichloromethane)	TX	4975	10184404
Naphthalene	TX	5005	10184404
n-Butyl alcohol (1-Butanol, n-Butanol)	TX	4425	10184404
n-Butylbenzene	TX	4435	10184404
n-Propylbenzene	TX	5090	10184404
o-Xylene	TX	5250	10184404
Pentachloroethane	TX	5035	10184404
Propionitrile (Ethyl cyanide)	TX	5080	10184404
Pyridine	TX	5095	10184404
sec-Butylbenzene	TX	4440	10184404

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Matrix: ***Solid & Chemical Materials***

Styrene	TX	5100	10184404
tert-Butyl alcohol	TX	4420	10184404
tert-Butylbenzene	TX	4445	10184404
Tetrachloroethylene (Perchloroethylene)	TX	5115	10184404
Toluene	TX	5140	10184404
trans-1,2-Dichloroethylene	TX	4700	10184404
trans-1,3-Dichloropropylene	TX	4685	10184404
trans-1,4-Dichloro-2-butene	TX	4605	10184404
Trichloroethene (Trichloroethylene)	TX	5170	10184404
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10184404
Vinyl acetate	TX	5225	10184404
Vinyl chloride	TX	5235	10184404
Xylene (total)	TX	5260	10184404

Method EPA 8270

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2,4,5-Tetrachlorobenzene	TX	6715	10185203
1,2,4-Trichlorobenzene	TX	5155	10185203
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10185203
1,2-Dichlorobenzene	TX	4610	10185203
1,2-Dinitrobenzene	TX	6155	10185203
1,2-Diphenylhydrazine	TX	6220	10185203
1,3,5-Trinitrobenzene (1,3,5-TNB)	TX	6885	10185203
1,3-Dichlorobenzene	TX	4615	10185203
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10185203
1,4-Dichlorobenzene	TX	4620	10185203
1,4-Dinitrobenzene	TX	6165	10185203
1,4-Naphthoquinone	TX	6420	10185203
1,4-Phenylenediamine	TX	6630	10185203
1-Chloronaphthalene	TX	5790	10185203
1-Naphthylamine	TX	6425	10185203

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Matrix: ***Solid & Chemical Materials***

2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10185203
2,3,4,6-Tetrachlorophenol	TX	6735	10185203
2,4,5-Trichlorophenol	TX	6835	10185203
2,4,5-Trimethylaniline	TX	6880	10185203
2,4,6-Trichlorophenol	TX	6840	10185203
2,4-Diaminotoluene	TX	5880	10185203
2,4-Dichlorophenol	TX	6000	10185203
2,4-Dimethylphenol	TX	6130	10185203
2,4-Dinitrophenol	TX	6175	10185203
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10185203
2,6-Dichlorophenol	TX	6005	10185203
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10185203
2-Acetylaminofluorene	TX	5515	10185203
2-Chloronaphthalene	TX	5795	10185203
2-Chlorophenol	TX	5800	10185203
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10185203
2-Methylaniline (o-Toluidine)	TX	5145	10185203
2-Methylnaphthalene	TX	6385	10185203
2-Methylphenol (o-Cresol)	TX	6400	10185203
2-Naphthylamine	TX	6430	10185203
2-Nitroaniline	TX	6460	10185203
2-Nitrophenol	TX	6490	10185203
2-Picoline (2-Methylpyridine)	TX	5050	10185203
3,3'-Dichlorobenzidine	TX	5945	10185203
3,3'-Dimethylbenzidine	TX	6120	10185203
3-Methylcholanthrene	TX	6355	10185203
3-Methylphenol (m-Cresol)	TX	6405	10185203
3-Nitroaniline	TX	6465	10185203
4-Aminobiphenyl	TX	5540	10185203
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10185203

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Expiration Date: 4/30/2021

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

Issue Date: 5/1/2020

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Matrix: ***Solid & Chemical Materials***

4-Chloro-3-methylphenol	TX	5700	10185203
4-Chloroaniline	TX	5745	10185203
4-Chlorophenyl phenylether	TX	5825	10185203
4-Methylphenol (p-Cresol)	TX	6410	10185203
4-Nitroaniline	TX	6470	10185203
4-Nitrophenol	TX	6500	10185203
4-Nitroquinoline-1-oxide	TX	6510	10185203
5-Nitro-o-toluidine	TX	6570	10185203
7,12-Dimethylbenz(a) anthracene	TX	6115	10185203
a-a-Dimethylphenethylamine	TX	6125	10185203
Acenaphthene	TX	5500	10185203
Acenaphthylene	TX	5505	10185203
Acetophenone	TX	5510	10185203
Aniline	TX	5545	10185203
Anthracene	TX	5555	10185203
Aramite	TX	5560	10185203
Atrazine	TX	7065	10185203
Azinphos-methyl (Guthion)	TX	7075	10185203
Azobenzene	TX	5562	10185203
Benzenethiol (Thiophenol)	TX	6750	10185203
Benzidine	TX	5595	10185203
Benzo(a)anthracene	TX	5575	10185203
Benzo(a)pyrene	TX	5580	10185203
Benzo(b)fluoranthene	TX	5585	10185203
Benzo(e)pyrene	TX	5605	10185203
Benzo(g,h,i)perylene	TX	5590	10185203
Benzo(k)fluoranthene	TX	5600	10185203
Benzoic acid	TX	5610	10185203
Benzyl alcohol	TX	5630	10185203
Biphenyl	TX	5640	10185203

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Matrix: ***Solid & Chemical Materials***

bis(2-Chloroethoxy)methane	TX	5760	10185203
bis(2-Chloroethyl) ether	TX	5765	10185203
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10185203
Butyl benzyl phthalate	TX	5670	10185203
Caprolactam	TX	7180	10185203
Carbaryl (Sevin)	TX	7195	10185203
Carbazole	TX	5680	10185203
Carbophenothion	TX	7220	10185203
Chlorobenzilate	TX	7260	10185203
Chrysene	TX	5855	10185203
Demeton	TX	7390	10185203
Demeton-o	TX	7395	10185203
Demeton-s	TX	7385	10185203
Diallate	TX	7405	10185203
Dibenz(a,h) anthracene	TX	5895	10185203
Dibenz(a,j) acridine	TX	5900	10185203
Dibenzo(a,e) pyrene	TX	5890	10185203
Dibenzofuran	TX	5905	10185203
Dichlorovos (DDVP, Dichlorvos)	TX	8610	10185203
Diethyl phthalate	TX	6070	10185203
Dimethoate	TX	7475	10185203
Dimethyl phthalate	TX	6135	10185203
Di-n-butyl phthalate	TX	5925	10185203
Di-n-octyl phthalate	TX	6200	10185203
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	TX	8620	10185203
Diphenylamine	TX	6205	10185203
Disulfoton	TX	8625	10185203
Ethyl methanesulfonate	TX	6260	10185203
Fluoranthene	TX	6265	10185203
Fluorene	TX	6270	10185203

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Matrix: ***Solid & Chemical Materials***

Hexachlorobenzene	TX	6275	10185203
Hexachlorobutadiene	TX	4835	10185203
Hexachlorocyclopentadiene	TX	6285	10185203
Hexachloroethane	TX	4840	10185203
Hexachlorophene	TX	6290	10185203
Hexachloropropene	TX	6295	10185203
Indeno(1,2,3-cd) pyrene	TX	6315	10185203
Isodrin	TX	7725	10185203
Isophorone	TX	6320	10185203
Isosafrole	TX	6325	10185203
Kepone	TX	7740	10185203
Malathion	TX	7770	10185203
Methapyrilene	TX	6345	10185203
Methyl methanesulfonate	TX	6375	10185203
Methyl parathion (Parathion, methyl)	TX	7825	10185203
Mevinphos	TX	7850	10185203
Naphthalene	TX	5005	10185203
Nitrobenzene	TX	5015	10185203
n-Nitrosodiethylamine	TX	6525	10185203
n-Nitrosodimethylamine	TX	6530	10185203
n-Nitrosodi-n-butylamine	TX	5025	10185203
n-Nitrosodi-n-propylamine	TX	6545	10185203
n-Nitrosodiphenylamine	TX	6535	10185203
n-Nitrosomethylethylamine	TX	6550	10185203
n-Nitrosomorpholine	TX	6555	10185203
n-Nitrosopiperidine	TX	6560	10185203
n-Nitrosopyrrolidine	TX	6565	10185203
o,o,o-Triethyl phosphorothioate	TX	8290	10185203
o-Anisidine	TX	5550	10185203
Parathion, ethyl	TX	7955	10185203

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Matrix: ***Solid & Chemical Materials***

p-Cresidine	TX	5860	10185203
Pentachlorobenzene	TX	6590	10185203
Pentachloronitrobenzene (PCNB)	TX	6600	10185203
Pentachlorophenol	TX	6605	10185203
Phenacetin	TX	6610	10185203
Phenanthrene	TX	6615	10185203
Phenol	TX	6625	10185203
Phorate	TX	7985	10185203
Pronamide (Kerb)	TX	6650	10185203
Pyrene	TX	6665	10185203
Pyridine	TX	5095	10185203
Quinoline	TX	6670	10185203
Safrole	TX	6685	10185203
Sulfotepp	TX	8155	10185203
Terbufos	TX	8185	10185203
Tetrachlorvinphos (Stirophos, Gardona)	TX	8197	10185203
Thionazin (Zinophos)	TX	8235	10185203
Toluene diisocyanate	TX	6775	10185203

Method EPA 8290

Analyte	AB	Analyte ID	Method ID
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	TX	9516	10187209
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	TX	9519	10187209
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	TX	9420	10187209
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	TX	9426	10187209
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	TX	9423	10187209
1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-HxCDF)	TX	9471	10187209
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-HxCDD)	TX	9453	10187209
1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-HxCDF)	TX	9474	10187209
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin(1,2,3,6,7,8-HxCDD)	TX	9456	10187209
1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-HxCDF)	TX	9477	10187209

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Matrix: ***Solid & Chemical Materials***

1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-HxCDD)	TX	9459	10187209
1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-PeCDF)	TX	9543	10187209
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD)	TX	9540	10187209
2,3,4,6,7,8-Hexachlorodibenzofuran (2,3,4,6,7,8-HxCDF)	TX	9480	10187209
2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF	TX	9549	10187209
2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	TX	9612	10187209
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	TX	9618	10187209
Total Heptachlorodibenzofuran (Total HpCDF)	TX	9444	10187209
Total Heptachlorodibenzo-p-dioxin (Total HpCDD)	TX	9438	10187209
Total Hexachlorodibenzofuran (Total HxCDF)	TX	9483	10187209
Total Hexachlorodibenzo-p-dioxin (Total HxCDD)	TX	9468	10187209
Total Pentachlorodibenzofuran (Total PeCDF)	TX	9552	10187209
Total Pentachlorodibenzo-p-dioxin (Total PeCDD)	TX	9555	10187209
Total Tetrachlorodibenzofuran (Total TCDF)	TX	9615	10187209
Total Tetrachlorodibenzo-p-dioxin (Total TCDD)	TX	9609	10187209

Method EPA 8316

Analyte	**AB**	**Analyte ID**	**Method ID**
Acrylamide	TX	4330	10188202

Method EPA 8330

Analyte	**AB**	**Analyte ID**	**Method ID**
1,3,5-Trinitrobenzene (1,3,5-TNB)	TX	6885	10189807
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10189807
2,4,6-Trinitrotoluene (2,4,6-TNT)	TX	9651	10189807
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10189807
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10189807
2-Amino-4,6-dinitrotoluene (2-am-dnt)	TX	9303	10189807
2-Nitrotoluene	TX	9507	10189807
3-Nitrotoluene	TX	9510	10189807
4-Amino-2,6-dinitrotoluene (4-am-dnt)	TX	9306	10189807
4-Nitrotoluene	TX	9513	10189807
Methyl-2,4,6-trinitrophenylnitramine (tetryl)	TX	6415	10189807

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Matrix: ***Solid & Chemical Materials***

Nitrobenzene	TX	5015	10189807
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	TX	9522	10189807
RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine)	TX	9432	10189807

Method EPA 9014

Analyte	**AB**	**Analyte ID**	**Method ID**
Amenable cyanide	TX	1510	10193803
Total cyanide	TX	1645	10193803

Method EPA 9038

Analyte	**AB**	**Analyte ID**	**Method ID**
Sulfate	TX	2000	10196608

Method EPA 9040

Analyte	**AB**	**Analyte ID**	**Method ID**
Corrosivity	TX	1615	10197203
pH	TX	1900	10196802

Method EPA 9045

Analyte	**AB**	**Analyte ID**	**Method ID**
Corrosivity	TX	1615	10197805
pH	TX	1900	10197805

Method EPA 9050

Analyte	**AB**	**Analyte ID**	**Method ID**
Conductivity	TX	1610	10198604

Method EPA 9056

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	TX	1540	10199209
Chloride	TX	1575	10199209
Fluoride	TX	1730	10199209
Nitrate as N	TX	1810	10199209
Nitrate-nitrite	TX	1820	10199209
Nitrite as N	TX	1840	10199209
Orthophosphate as P	TX	1870	10199209
Sulfate	TX	2000	10199209

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Matrix: ***Solid & Chemical Materials***

Method	Analyte	AB	Analyte ID	Method ID
EPA 9060	Total Organic Carbon (TOC)	TX	2040	10200201
EPA 9065	Total phenolics	TX	1905	10200405
EPA 9071	n-Hexane Extractable Material (HEM) (O&G)	TX	1803	10201204
EPA 9095	Paint Filter Liquids Test	TX	10312	10204009
EPA 9250	Chloride	TX	1575	10207202
SM 2320 B	Alkalinity as CaCO3	TX	1505	20045005
SM 2510 B	Conductivity	TX	1610	20048004
SM 2540 G	Residue-total (total solids)	TX	1950	20005203
SSA/ASA Part 3:34	Carbon, organic (Walkley-Black)	TX	10340	SSA/ASA Pt 3:34
TCEQ 1005	Total Petroleum Hydrocarbons (TPH)	TX	2050	90019208

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June 29, 2020

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

Work Order: **HS20060975**

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

Dear Eric Matzner,

ALS Environmental received 12 sample(s) on Jun 19, 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	
WorkOrder:	**HS20060975**	

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.
Project:	Houston TX-Wood Preserving Works
WorkOrder:	**HS20060975**

TRRP Laboratory Data Package Cover Page

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: 06/29/2020				
Project Name: Houston TX-Wood Preserving Works			Laboratory Job Number: HS20060975				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 154767,R363651,R363717,R364091				
#[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				
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: 06/29/2020				
Project Name: Houston TX-Wood Preserving Works			Laboratory Job Number: HS20060975				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 154767,R363651,R363717,R364091				
#[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: 06/29/2020
Project Name: Houston TX-Wood Preserving Works	Laboratory Job Number: HS20060975
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 154767,R363651,R363717,R364091

ER#[5]	Description
	No exceptions

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
Work Order: HS20060975

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20060975-01	SO-1620-SG25(0.5-1)20200618	Soil		18-Jun-2020 08:30	19-Jun-2020 13:00	☐
HS20060975-02	SO-1620-SG25(5.5-6)20200618	Soil		18-Jun-2020 08:58	19-Jun-2020 13:00	☐
HS20060975-03	SO-1620-SG13R(0.5-1)20200618	Soil		18-Jun-2020 10:00	19-Jun-2020 13:00	☐
HS20060975-04	SO-1620-SG13R(5.5-6)20200618	Soil		18-Jun-2020 10:30	19-Jun-2020 13:00	☐
HS20060975-05	SO-1620-SG23(0.5-1)20200618	Soil		18-Jun-2020 13:08	19-Jun-2020 13:00	☐
HS20060975-06	SO-1620-SG23(5.5-6)20200618	Soil		18-Jun-2020 13:30	19-Jun-2020 13:00	☐
HS20060975-07	SO-1620-SG24(0.5-1)20200618	Soil		18-Jun-2020 14:49	19-Jun-2020 13:00	☐
HS20060975-08	SO-1620-SG24(5.5-6)20200618	Soil		18-Jun-2020 15:50	19-Jun-2020 13:00	☐
HS20060975-09	SO-1620-SG26(0.5-1)20200619	Soil		19-Jun-2020 09:15	19-Jun-2020 13:00	☐
HS20060975-10	SO-1620-SG26(5.5-6)20200619	Soil		19-Jun-2020 09:52	19-Jun-2020 13:00	☐
HS20060975-11	SO-1620-SG27(0.5-1)20200619	Soil		19-Jun-2020 10:10	19-Jun-2020 13:00	☐
HS20060975-12	SO-1620-SG27(5.5-6)20200618	Soil		18-Jun-2020 10:30	19-Jun-2020 13:00	☐

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG25(0.5-1)20200618
Collection Date: 18-Jun-2020 08:30

ANALYTICAL REPORT
WorkOrder:HS20060975
Lab ID:HS20060975-01
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00068	0.0068	mg/Kg-dry	1	22-Jun-2020 16:09
Ethylbenzene		U	0.00095	0.0068	mg/Kg-dry	1	22-Jun-2020 16:09
Xylenes, Total		U	0.0014	0.0068	mg/Kg-dry	1	22-Jun-2020 16:09
Surr: 1,2-Dichloroethane-d4	*83.4*			*70-126*	*%REC*	*1*	*22-Jun-2020 16:09*
Surr: 4-Bromofluorobenzene	*97.2*			*70-130*	*%REC*	*1*	*22-Jun-2020 16:09*
Surr: Dibromofluoromethane	*91.9*			*70-130*	*%REC*	*1*	*22-Jun-2020 16:09*
Surr: Toluene-d8	*102*			*70-130*	*%REC*	*1*	*22-Jun-2020 16:09*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 23-Jun-2020		Analyst: GEY
Naphthalene	**0.0046**		**0.00066**	**0.0036**	**mg/Kg-dry**	1	27-Jun-2020 23:39
Surr: 2-Fluorobiphenyl	*52.6*			*43-125*	*%REC*	*1*	*27-Jun-2020 23:39*
Surr: 4-Terphenyl-d14	*59.9*			*32-125*	*%REC*	*1*	*27-Jun-2020 23:39*
Surr: Nitrobenzene-d5	*66.0*			*37-125*	*%REC*	*1*	*27-Jun-2020 23:39*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: JAC
Percent Moisture	**8.93**		**0.0100**	**0.0100**	**wt%**	1	27-Jun-2020 09:00

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG25(5.5-6)20200618
Collection Date: 18-Jun-2020 08:58

ANALYTICAL REPORT
WorkOrder:HS20060975
Lab ID:HS20060975-02
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00030	0.0030	mg/Kg-dry	1	22-Jun-2020 16:34
Ethylbenzene		U	0.00042	0.0030	mg/Kg-dry	1	22-Jun-2020 16:34
Xylenes, Total		U	0.00059	0.0030	mg/Kg-dry	1	22-Jun-2020 16:34
Surr: 1,2-Dichloroethane-d4	*84.0*			*70-126*	*%REC*	*1*	*22-Jun-2020 16:34*
Surr: 4-Bromofluorobenzene	*97.8*			*70-130*	*%REC*	*1*	*22-Jun-2020 16:34*
Surr: Dibromofluoromethane	*91.6*			*70-130*	*%REC*	*1*	*22-Jun-2020 16:34*
Surr: Toluene-d8	*102*			*70-130*	*%REC*	*1*	*22-Jun-2020 16:34*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 23-Jun-2020		Analyst: GEY
Naphthalene		U	0.00070	0.0038	mg/Kg-dry	1	27-Jun-2020 20:03
Surr: 2-Fluorobiphenyl	*65.1*			*43-125*	*%REC*	*1*	*27-Jun-2020 20:03*
Surr: 4-Terphenyl-d14	*75.1*			*32-125*	*%REC*	*1*	*27-Jun-2020 20:03*
Surr: Nitrobenzene-d5	*64.4*			*37-125*	*%REC*	*1*	*27-Jun-2020 20:03*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: JAC
Percent Moisture	**14.0**		**0.0100**	**0.0100**	**wt%**	1	27-Jun-2020 09:00

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG13R(0.5-1)20200618
Collection Date: 18-Jun-2020 10:00

ANALYTICAL REPORT
WorkOrder:HS20060975
Lab ID:HS20060975-03
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00053	0.0053	mg/Kg-dry	1	22-Jun-2020 16:59
Ethylbenzene		U	0.00075	0.0053	mg/Kg-dry	1	22-Jun-2020 16:59
Xylenes, Total		U	0.0011	0.0053	mg/Kg-dry	1	22-Jun-2020 16:59
Surr: 1,2-Dichloroethane-d4	*84.5*			*70-126*	*%REC*	*1*	*22-Jun-2020 16:59*
Surr: 4-Bromofluorobenzene	*97.3*			*70-130*	*%REC*	*1*	*22-Jun-2020 16:59*
Surr: Dibromofluoromethane	*89.9*			*70-130*	*%REC*	*1*	*22-Jun-2020 16:59*
Surr: Toluene-d8	*102*			*70-130*	*%REC*	*1*	*22-Jun-2020 16:59*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 23-Jun-2020		Analyst: GEY
Naphthalene		U	0.00074	0.0041	mg/Kg-dry	1	27-Jun-2020 20:23
Surr: 2-Fluorobiphenyl	*49.4*			*43-125*	*%REC*	*1*	*27-Jun-2020 20:23*
Surr: 4-Terphenyl-d14	*65.2*			*32-125*	*%REC*	*1*	*27-Jun-2020 20:23*
Surr: Nitrobenzene-d5	*51.4*			*37-125*	*%REC*	*1*	*27-Jun-2020 20:23*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: JAC
Percent Moisture	**19.4**		**0.0100**	**0.0100**	**wt%**	1	27-Jun-2020 09:00

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG13R(5.5-6)20200618
Collection Date: 18-Jun-2020 10:30

ANALYTICAL REPORT
WorkOrder:HS20060975
Lab ID:HS20060975-04
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00044	0.0044	mg/Kg-dry	1	22-Jun-2020 17:24
Ethylbenzene		U	0.00062	0.0044	mg/Kg-dry	1	22-Jun-2020 17:24
Xylenes, Total		U	0.00089	0.0044	mg/Kg-dry	1	22-Jun-2020 17:24
Surr: 1,2-Dichloroethane-d4	*82.9*			*70-126*	*%REC*	*1*	*22-Jun-2020 17:24*
Surr: 4-Bromofluorobenzene	*97.5*			*70-130*	*%REC*	*1*	*22-Jun-2020 17:24*
Surr: Dibromofluoromethane	*89.8*			*70-130*	*%REC*	*1*	*22-Jun-2020 17:24*
Surr: Toluene-d8	*101*			*70-130*	*%REC*	*1*	*22-Jun-2020 17:24*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 23-Jun-2020		Analyst: GEY
Naphthalene		U	0.00073	0.0040	mg/Kg-dry	1	27-Jun-2020 20:43
Surr: 2-Fluorobiphenyl	*47.7*			*43-125*	*%REC*	*1*	*27-Jun-2020 20:43*
Surr: 4-Terphenyl-d14	*79.4*			*32-125*	*%REC*	*1*	*27-Jun-2020 20:43*
Surr: Nitrobenzene-d5	*69.2*			*37-125*	*%REC*	*1*	*27-Jun-2020 20:43*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: JAC
Percent Moisture	**17.7**		**0.0100**	**0.0100**	**wt%**	1	27-Jun-2020 09:00

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG23(0.5-1)20200618
Collection Date: 18-Jun-2020 13:08

ANALYTICAL REPORT
WorkOrder:HS20060975
Lab ID:HS20060975-05
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene	U		0.00031	0.0031	mg/Kg-dry	1	22-Jun-2020 17:49
Ethylbenzene	U		0.00044	0.0031	mg/Kg-dry	1	22-Jun-2020 17:49
Xylenes, Total	U		0.00062	0.0031	mg/Kg-dry	1	22-Jun-2020 17:49
Surr: 1,2-Dichloroethane-d4	*85.0*			*70-126*	*%REC*	*1*	*22-Jun-2020 17:49*
Surr: 4-Bromofluorobenzene	*96.9*			*70-130*	*%REC*	*1*	*22-Jun-2020 17:49*
Surr: Dibromofluoromethane	*90.5*			*70-130*	*%REC*	*1*	*22-Jun-2020 17:49*
Surr: Toluene-d8	*101*			*70-130*	*%REC*	*1*	*22-Jun-2020 17:49*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 23-Jun-2020		Analyst: GEY
Naphthalene	**0.00071**	J	**0.00070**	**0.0038**	**mg/Kg-dry**	1	27-Jun-2020 21:02
Surr: 2-Fluorobiphenyl	*59.2*			*43-125*	*%REC*	*1*	*27-Jun-2020 21:02*
Surr: 4-Terphenyl-d14	*73.0*			*32-125*	*%REC*	*1*	*27-Jun-2020 21:02*
Surr: Nitrobenzene-d5	*57.9*			*37-125*	*%REC*	*1*	*27-Jun-2020 21:02*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: JAC
Percent Moisture	**15.0**		**0.0100**	**0.0100**	**wt%**	1	27-Jun-2020 09:00

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG23(5.5-6)20200618
Collection Date: 18-Jun-2020 13:30

ANALYTICAL REPORT
WorkOrder:HS20060975
Lab ID:HS20060975-06
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00032	0.0032	mg/Kg-dry	1	23-Jun-2020 02:08
Ethylbenzene		U	0.00044	0.0032	mg/Kg-dry	1	23-Jun-2020 02:08
Xylenes, Total		U	0.00064	0.0032	mg/Kg-dry	1	23-Jun-2020 02:08
Surr: 1,2-Dichloroethane-d4	*85.8*			*70-126*	*%REC*	*1*	*23-Jun-2020 02:08*
Surr: 4-Bromofluorobenzene	*98.1*			*70-130*	*%REC*	*1*	*23-Jun-2020 02:08*
Surr: Dibromofluoromethane	*88.5*			*70-130*	*%REC*	*1*	*23-Jun-2020 02:08*
Surr: Toluene-d8	*101*			*70-130*	*%REC*	*1*	*23-Jun-2020 02:08*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 23-Jun-2020		Analyst: GEY
Naphthalene		U	0.00071	0.0039	mg/Kg-dry	1	27-Jun-2020 21:22
Surr: 2-Fluorobiphenyl	*67.8*			*43-125*	*%REC*	*1*	*27-Jun-2020 21:22*
Surr: 4-Terphenyl-d14	*70.6*			*32-125*	*%REC*	*1*	*27-Jun-2020 21:22*
Surr: Nitrobenzene-d5	*68.1*			*37-125*	*%REC*	*1*	*27-Jun-2020 21:22*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: JAC
Percent Moisture	**16.6**		**0.0100**	**0.0100**	**wt%**	1	27-Jun-2020 09:00

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG24(0.5-1)20200618
Collection Date: 18-Jun-2020 14:49

ANALYTICAL REPORT
WorkOrder:HS20060975
Lab ID:HS20060975-07
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene	U		0.00038	0.0038	mg/Kg-dry	1	23-Jun-2020 02:33
Ethylbenzene	U		0.00053	0.0038	mg/Kg-dry	1	23-Jun-2020 02:33
Xylenes, Total	U		0.00076	0.0038	mg/Kg-dry	1	23-Jun-2020 02:33
Surr: 1,2-Dichloroethane-d4	*84.2*			*70-126*	*%REC*	*1*	*23-Jun-2020 02:33*
Surr: 4-Bromofluorobenzene	*98.3*			*70-130*	*%REC*	*1*	*23-Jun-2020 02:33*
Surr: Dibromofluoromethane	*88.7*			*70-130*	*%REC*	*1*	*23-Jun-2020 02:33*
Surr: Toluene-d8	*103*			*70-130*	*%REC*	*1*	*23-Jun-2020 02:33*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 23-Jun-2020		Analyst: GEY
Naphthalene	**0.0010**	J	**0.00069**	**0.0038**	**mg/Kg-dry**	1	27-Jun-2020 21:41
Surr: 2-Fluorobiphenyl	*45.5*			*43-125*	*%REC*	*1*	*27-Jun-2020 21:41*
Surr: 4-Terphenyl-d14	*63.5*			*32-125*	*%REC*	*1*	*27-Jun-2020 21:41*
Surr: Nitrobenzene-d5	*51.6*			*37-125*	*%REC*	*1*	*27-Jun-2020 21:41*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: JAC
Percent Moisture	**14.4**		**0.0100**	**0.0100**	**wt%**	1	27-Jun-2020 09:00

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG24(5.5-6)20200618
Collection Date: 18-Jun-2020 15:50

ANALYTICAL REPORT
WorkOrder:HS20060975
Lab ID:HS20060975-08
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00030	0.0030	mg/Kg-dry	1	23-Jun-2020 02:58
Ethylbenzene		U	0.00043	0.0030	mg/Kg-dry	1	23-Jun-2020 02:58
Xylenes, Total		U	0.00061	0.0030	mg/Kg-dry	1	23-Jun-2020 02:58
Surr: 1,2-Dichloroethane-d4	*83.9*			*70-126*	*%REC*	*1*	*23-Jun-2020 02:58*
Surr: 4-Bromofluorobenzene	*98.7*			*70-130*	*%REC*	*1*	*23-Jun-2020 02:58*
Surr: Dibromofluoromethane	*88.5*			*70-130*	*%REC*	*1*	*23-Jun-2020 02:58*
Surr: Toluene-d8	*102*			*70-130*	*%REC*	*1*	*23-Jun-2020 02:58*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 23-Jun-2020		Analyst: GEY
Naphthalene		U	0.00069	0.0038	mg/Kg-dry	1	27-Jun-2020 22:01
Surr: 2-Fluorobiphenyl	*52.8*			*43-125*	*%REC*	*1*	*27-Jun-2020 22:01*
Surr: 4-Terphenyl-d14	*65.6*			*32-125*	*%REC*	*1*	*27-Jun-2020 22:01*
Surr: Nitrobenzene-d5	*52.9*			*37-125*	*%REC*	*1*	*27-Jun-2020 22:01*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: JAC
Percent Moisture	**14.7**		**0.0100**	**0.0100**	**wt%**	1	27-Jun-2020 09:00

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG26(0.5-1)20200619
Collection Date: 19-Jun-2020 09:15

ANALYTICAL REPORT
WorkOrder:HS20060975
Lab ID:HS20060975-09
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00046	0.0046	mg/Kg-dry	1	23-Jun-2020 03:23
Ethylbenzene		U	0.00064	0.0046	mg/Kg-dry	1	23-Jun-2020 03:23
Xylenes, Total		U	0.00092	0.0046	mg/Kg-dry	1	23-Jun-2020 03:23
Surr: 1,2-Dichloroethane-d4	*86.1*			*70-126*	*%REC*	*1*	*23-Jun-2020 03:23*
Surr: 4-Bromofluorobenzene	*95.2*			*70-130*	*%REC*	*1*	*23-Jun-2020 03:23*
Surr: Dibromofluoromethane	*89.8*			*70-130*	*%REC*	*1*	*23-Jun-2020 03:23*
Surr: Toluene-d8	*102*			*70-130*	*%REC*	*1*	*23-Jun-2020 03:23*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 23-Jun-2020		Analyst: GEY
Naphthalene	**0.0039**		**0.00064**	**0.0035**	**mg/Kg-dry**	1	27-Jun-2020 23:20
Surr: 2-Fluorobiphenyl	*63.5*			*43-125*	*%REC*	*1*	*27-Jun-2020 23:20*
Surr: 4-Terphenyl-d14	*68.5*			*32-125*	*%REC*	*1*	*27-Jun-2020 23:20*
Surr: Nitrobenzene-d5	*58.2*			*37-125*	*%REC*	*1*	*27-Jun-2020 23:20*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: JAC
Percent Moisture	**7.56**		**0.0100**	**0.0100**	**wt%**	1	27-Jun-2020 09:00

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG26(5.5-6)20200619
Collection Date: 19-Jun-2020 09:52

ANALYTICAL REPORT
WorkOrder:HS20060975
Lab ID:HS20060975-10
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene		U	0.00039	0.0039	mg/Kg-dry	1	23-Jun-2020 03:48
Ethylbenzene		U	0.00054	0.0039	mg/Kg-dry	1	23-Jun-2020 03:48
Xylenes, Total		U	0.00077	0.0039	mg/Kg-dry	1	23-Jun-2020 03:48
Surr: 1,2-Dichloroethane-d4	*84.8*			*70-126*	*%REC*	*1*	*23-Jun-2020 03:48*
Surr: 4-Bromofluorobenzene	*97.7*			*70-130*	*%REC*	*1*	*23-Jun-2020 03:48*
Surr: Dibromofluoromethane	*89.5*			*70-130*	*%REC*	*1*	*23-Jun-2020 03:48*
Surr: Toluene-d8	*101*			*70-130*	*%REC*	*1*	*23-Jun-2020 03:48*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 23-Jun-2020		Analyst: GEY
Naphthalene		U	0.00069	0.0038	mg/Kg-dry	1	27-Jun-2020 22:21
Surr: 2-Fluorobiphenyl	*46.5*			*43-125*	*%REC*	*1*	*27-Jun-2020 22:21*
Surr: 4-Terphenyl-d14	*71.5*			*32-125*	*%REC*	*1*	*27-Jun-2020 22:21*
Surr: Nitrobenzene-d5	*42.5*			*37-125*	*%REC*	*1*	*27-Jun-2020 22:21*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: JAC
Percent Moisture	**13.3**		**0.0100**	**0.0100**	**wt%**	1	27-Jun-2020 09:00

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG27(0.5-1)20200619
Collection Date: 19-Jun-2020 10:10

ANALYTICAL REPORT
WorkOrder:HS20060975
Lab ID:HS20060975-11
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene	U		0.00069	0.0069	mg/Kg-dry	1	23-Jun-2020 04:13
Ethylbenzene	U		0.00097	0.0069	mg/Kg-dry	1	23-Jun-2020 04:13
Xylenes, Total	U		0.0014	0.0069	mg/Kg-dry	1	23-Jun-2020 04:13
Surr: 1,2-Dichloroethane-d4	*81.2*			*70-126*	*%REC*	*1*	*23-Jun-2020 04:13*
Surr: 4-Bromofluorobenzene	*95.3*			*70-130*	*%REC*	*1*	*23-Jun-2020 04:13*
Surr: Dibromofluoromethane	*88.0*			*70-130*	*%REC*	*1*	*23-Jun-2020 04:13*
Surr: Toluene-d8	*104*			*70-130*	*%REC*	*1*	*23-Jun-2020 04:13*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 23-Jun-2020		Analyst: GEY
Naphthalene	**0.0022**	J	**0.00064**	**0.0035**	**mg/Kg-dry**	1	27-Jun-2020 22:40
Surr: 2-Fluorobiphenyl	*51.2*			*43-125*	*%REC*	*1*	*27-Jun-2020 22:40*
Surr: 4-Terphenyl-d14	*54.1*			*32-125*	*%REC*	*1*	*27-Jun-2020 22:40*
Surr: Nitrobenzene-d5	*52.3*			*37-125*	*%REC*	*1*	*27-Jun-2020 22:40*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: JAC
Percent Moisture	**6.33**		**0.0100**	**0.0100**	**wt%**	1	27-Jun-2020 09:00

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: SO-1620-SG27(5.5-6)20200618
Collection Date: 18-Jun-2020 10:30

ANALYTICAL REPORT
WorkOrder:HS20060975
Lab ID:HS20060975-12
Matrix:Soil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene	U		0.00039	0.0039	mg/Kg-dry	1	23-Jun-2020 04:38
Ethylbenzene	U		0.00054	0.0039	mg/Kg-dry	1	23-Jun-2020 04:38
Xylenes, Total	U		0.00077	0.0039	mg/Kg-dry	1	23-Jun-2020 04:38
Surr: 1,2-Dichloroethane-d4	*86.4*			*70-126*	*%REC*	*1*	*23-Jun-2020 04:38*
Surr: 4-Bromofluorobenzene	*97.9*			*70-130*	*%REC*	*1*	*23-Jun-2020 04:38*
Surr: Dibromofluoromethane	*88.8*			*70-130*	*%REC*	*1*	*23-Jun-2020 04:38*
Surr: Toluene-d8	*103*			*70-130*	*%REC*	*1*	*23-Jun-2020 04:38*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3541 / 23-Jun-2020		Analyst: GEY
Naphthalene	**0.0018**	J	**0.00070**	**0.0038**	**mg/Kg-dry**	1	27-Jun-2020 23:00
Surr: 2-Fluorobiphenyl	*45.3*			*43-125*	*%REC*	*1*	*27-Jun-2020 23:00*
Surr: 4-Terphenyl-d14	*53.8*			*32-125*	*%REC*	*1*	*27-Jun-2020 23:00*
Surr: Nitrobenzene-d5	*40.1*			*37-125*	*%REC*	*1*	*27-Jun-2020 23:00*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: JAC
Percent Moisture	**14.8**		**0.0100**	**0.0100**	**wt%**	1	27-Jun-2020 09:00

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
WorkOrder: HS20060975

Batch ID: 3787 **Start Date:** 22 Jun 2020 06:57 **End Date:** 22 Jun 2020 06:57
Method: VOLATILES BY SW8260C

Sample ID	Container	Sample Wt/Vol	Final Volume	Weight Factor	Container Type
HS20060975-01	1	4.04 (g)	5 (mL)	1.24	TerraCore (5035A)
HS20060975-02	1	9.72 (g)	5 (mL)	0.51	TerraCore (5035A)
HS20060975-03	1	5.805 (g)	5 (mL)	0.86	TerraCore (5035A)
HS20060975-04	1	6.83 (g)	5 (mL)	0.73	TerraCore (5035A)
HS20060975-05	1	9.468 (g)	5 (mL)	0.53	TerraCore (5035A)
HS20060975-06	1	9.428 (g)	5 (mL)	0.53	TerraCore (5035A)
HS20060975-07	1	7.732 (g)	5 (mL)	0.65	TerraCore (5035A)
HS20060975-08	1	9.68 (g)	5 (mL)	0.52	TerraCore (5035A)
HS20060975-09	1	5.886 (g)	5 (mL)	0.85	TerraCore (5035A)
HS20060975-10	1	7.412 (g)	5 (mL)	0.67	TerraCore (5035A)
HS20060975-11	1	3.861 (g)	5 (mL)	1.3	TerraCore (5035A)
HS20060975-12	1	7.61 (g)	5 (mL)	0.66	TerraCore (5035A)

Batch ID: 154767 **Start Date:** 23 Jun 2020 10:30 **End Date:** 23 Jun 2020 18:00
Method: SV SOXHLET EXTRACT-LOWLEVEL-SW3541 **Prep Code:** 3541_B_LOW

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20060975-01		30.15 (g)	1 (mL)	0.03317
HS20060975-02		30.01 (g)	1 (mL)	0.03332
HS20060975-03		30.1 (g)	1 (mL)	0.03322
HS20060975-04		30.09 (g)	1 (mL)	0.03323
HS20060975-05		30.27 (g)	1 (mL)	0.03304
HS20060975-06		30.19 (g)	1 (mL)	0.03312
HS20060975-07		30.3 (g)	1 (mL)	0.033
HS20060975-08		30.49 (g)	1 (mL)	0.0328
HS20060975-09		30.28 (g)	1 (mL)	0.03303
HS20060975-10		30.1 (g)	1 (mL)	0.03322
HS20060975-11		30.09 (g)	1 (mL)	0.03323
HS20060975-12		30.29 (g)	1 (mL)	0.03301

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20060975

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 154767 (1)	**Test Name :** LOW-LEVEL SEMIVOLATILES BY 8270D				**Matrix:** Soil	
HS20060975-01	SO-1620-SG25(0.5-1) 20200618	18 Jun 2020 08:30		23 Jun 2020 10:30	27 Jun 2020 23:39	1
HS20060975-02	SO-1620-SG25(5.5-6) 20200618	18 Jun 2020 08:58		23 Jun 2020 10:30	27 Jun 2020 20:03	1
HS20060975-03	SO-1620-SG13R(0.5-1) 20200618	18 Jun 2020 10:00		23 Jun 2020 10:30	27 Jun 2020 20:23	1
HS20060975-04	SO-1620-SG13R(5.5-6) 20200618	18 Jun 2020 10:30		23 Jun 2020 10:30	27 Jun 2020 20:43	1
HS20060975-05	SO-1620-SG23(0.5-1) 20200618	18 Jun 2020 13:08		23 Jun 2020 10:30	27 Jun 2020 21:02	1
HS20060975-06	SO-1620-SG23(5.5-6) 20200618	18 Jun 2020 13:30		23 Jun 2020 10:30	27 Jun 2020 21:22	1
HS20060975-07	SO-1620-SG24(0.5-1) 20200618	18 Jun 2020 14:49		23 Jun 2020 10:30	27 Jun 2020 21:41	1
HS20060975-08	SO-1620-SG24(5.5-6) 20200618	18 Jun 2020 15:50		23 Jun 2020 10:30	27 Jun 2020 22:01	1
HS20060975-09	SO-1620-SG26(0.5-1) 20200619	19 Jun 2020 09:15		23 Jun 2020 10:30	27 Jun 2020 23:20	1
HS20060975-10	SO-1620-SG26(5.5-6) 20200619	19 Jun 2020 09:52		23 Jun 2020 10:30	27 Jun 2020 22:21	1
HS20060975-11	SO-1620-SG27(0.5-1) 20200619	19 Jun 2020 10:10		23 Jun 2020 10:30	27 Jun 2020 22:40	1
HS20060975-12	SO-1620-SG27(5.5-6) 20200618	18 Jun 2020 10:30		23 Jun 2020 10:30	27 Jun 2020 23:00	1
Batch ID: R363651 (0)	**Test Name :** VOLATILES BY SW8260C				**Matrix:** Soil	
HS20060975-01	SO-1620-SG25(0.5-1) 20200618	18 Jun 2020 08:30			22 Jun 2020 16:09	1
HS20060975-02	SO-1620-SG25(5.5-6) 20200618	18 Jun 2020 08:58			22 Jun 2020 16:34	1
HS20060975-03	SO-1620-SG13R(0.5-1) 20200618	18 Jun 2020 10:00			22 Jun 2020 16:59	1
HS20060975-04	SO-1620-SG13R(5.5-6) 20200618	18 Jun 2020 10:30			22 Jun 2020 17:24	1
HS20060975-05	SO-1620-SG23(0.5-1) 20200618	18 Jun 2020 13:08			22 Jun 2020 17:49	1
Batch ID: R363717 (0)	**Test Name :** VOLATILES BY SW8260C				**Matrix:** Soil	
HS20060975-06	SO-1620-SG23(5.5-6) 20200618	18 Jun 2020 13:30			23 Jun 2020 02:08	1
HS20060975-07	SO-1620-SG24(0.5-1) 20200618	18 Jun 2020 14:49			23 Jun 2020 02:33	1
HS20060975-08	SO-1620-SG24(5.5-6) 20200618	18 Jun 2020 15:50			23 Jun 2020 02:58	1
HS20060975-09	SO-1620-SG26(0.5-1) 20200619	19 Jun 2020 09:15			23 Jun 2020 03:23	1
HS20060975-10	SO-1620-SG26(5.5-6) 20200619	19 Jun 2020 09:52			23 Jun 2020 03:48	1
HS20060975-11	SO-1620-SG27(0.5-1) 20200619	19 Jun 2020 10:10			23 Jun 2020 04:13	1
HS20060975-12	SO-1620-SG27(5.5-6) 20200618	18 Jun 2020 10:30			23 Jun 2020 04:38	1

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20060975

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R364091 (0)	**Test Name :** MOISTURE - ASTM D2216				**Matrix:** Soil	
HS20060975-01	SO-1620-SG25(0.5-1) 20200618	18 Jun 2020 08:30			27 Jun 2020 09:00	1
HS20060975-02	SO-1620-SG25(5.5-6) 20200618	18 Jun 2020 08:58			27 Jun 2020 09:00	1
HS20060975-03	SO-1620-SG13R(0.5-1) 20200618	18 Jun 2020 10:00			27 Jun 2020 09:00	1
HS20060975-04	SO-1620-SG13R(5.5-6) 20200618	18 Jun 2020 10:30			27 Jun 2020 09:00	1
HS20060975-05	SO-1620-SG23(0.5-1) 20200618	18 Jun 2020 13:08			27 Jun 2020 09:00	1
HS20060975-06	SO-1620-SG23(5.5-6) 20200618	18 Jun 2020 13:30			27 Jun 2020 09:00	1
HS20060975-07	SO-1620-SG24(0.5-1) 20200618	18 Jun 2020 14:49			27 Jun 2020 09:00	1
HS20060975-08	SO-1620-SG24(5.5-6) 20200618	18 Jun 2020 15:50			27 Jun 2020 09:00	1
HS20060975-09	SO-1620-SG26(0.5-1) 20200619	19 Jun 2020 09:15			27 Jun 2020 09:00	1
HS20060975-10	SO-1620-SG26(5.5-6) 20200619	19 Jun 2020 09:52			27 Jun 2020 09:00	1
HS20060975-11	SO-1620-SG27(0.5-1) 20200619	19 Jun 2020 10:10			27 Jun 2020 09:00	1
HS20060975-12	SO-1620-SG27(5.5-6) 20200618	18 Jun 2020 10:30			27 Jun 2020 09:00	1

WorkOrder: HS20060975
InstrumentID: SV-7
Test Code: 8270_LOW_S
Test Number: SW8270
Test Name: Low-Level Semivolatiles by 8270D

METHOD DETECTION / REPORTING LIMITS

Matrix: Solid **Units:** mg/Kg

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Naphthalene	91-20-3	0.0017	0.0020	0.00060	0.0033
S	2-Fluorobiphenyl	321-60-8	0	0	0	0
S	4-Terphenyl-d14	1718-51-0	0	0	0	0
S	Nitrobenzene-d5	4165-60-0	0	0	0	0

WorkOrder: HS20060975
InstrumentID: VOA5
Test Code: 8260_S
Test Number: SW8260
Test Name: Volatiles by SW8260C

METHOD DETECTION / REPORTING LIMITS

Matrix: Solid **Units:** mg/Kg

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Benzene	71-43-2	0.0012	0.0012	0.00050	0.0050
A	Ethylbenzene	100-41-4	0.0012	0.0013	0.00070	0.0050
A	Xylenes, Total	1330-20-7	0.0012	0.0016	0.0010	0.0050
S	1,2-Dichloroethane-d4	17060-07-0	0	0	0	0
S	4-Bromofluorobenzene	460-00-4	0	0	0	0
S	Dibromofluoromethane	1868-53-7	0	0	0	0
S	Toluene-d8	2037-26-5	0	0	0	0

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20060975

QC BATCH REPORT

Batch ID: 154767 (1) **Instrument: SV-7** **Method: LOW-LEVEL SEMIVOLATILES BY 8270D**

MBLK Sample ID: **MBLK-154767** Units: **ug/Kg** Analysis Date: **25-Jun-2020 11:55**
Client ID: Run ID: **SV-7_363901** SeqNo: **5637804** PrepDate: **23-Jun-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	U	3.3								
Surr: 2-Fluorobiphenyl	*111.6*	*0*	*167*	*0*	*66.8*	*43 - 125*				
Surr: 4-Terphenyl-d14	*131.5*	*0*	*167*	*0*	*78.8*	*32 - 125*				
Surr: Nitrobenzene-d5	*126.4*	*0*	*167*	*0*	*75.7*	*37 - 125*				

LCS Sample ID: **LCS-154767** Units: **ug/Kg** Analysis Date: **25-Jun-2020 12:15**
Client ID: Run ID: **SV-7_363901** SeqNo: **5637805** PrepDate: **23-Jun-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	135.9	3.3	167	0	81.4	50 - 125				
Surr: 2-Fluorobiphenyl	*156.5*	*0*	*167*	*0*	*93.7*	*43 - 125*				
Surr: 4-Terphenyl-d14	*134.3*	*0*	*167*	*0*	*80.4*	*32 - 125*				
Surr: Nitrobenzene-d5	*110.6*	*0*	*167*	*0*	*66.3*	*37 - 125*				

MS Sample ID: **HS20061011-02MS** Units: **ug/Kg** Analysis Date: **25-Jun-2020 13:53**
Client ID: Run ID: **SV-7_363901** SeqNo: **5637807** PrepDate: **23-Jun-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	180.2	3.3	164.9	66.09	69.2	50 - 125				
Surr: 2-Fluorobiphenyl	*111*	*0*	*164.9*	*0*	*67.3*	*43 - 125*				
Surr: 4-Terphenyl-d14	*111.1*	*0*	*164.9*	*0*	*67.4*	*32 - 125*				
Surr: Nitrobenzene-d5	*133.5*	*0*	*164.9*	*0*	*81.0*	*37 - 125*				

MSD Sample ID: **HS20061011-02MSD** Units: **ug/Kg** Analysis Date: **25-Jun-2020 14:13**
Client ID: Run ID: **SV-7_363901** SeqNo: **5637808** PrepDate: **23-Jun-2020** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	186.5	3.3	165.9	66.09	72.6	50 - 125	180.2	3.39	30	
Surr: 2-Fluorobiphenyl	*98.02*	*0*	*165.9*	*0*	*59.1*	*43 - 125*	*111*	*12.4*	*30*	
Surr: 4-Terphenyl-d14	*96.12*	*0*	*165.9*	*0*	*57.9*	*32 - 125*	*111.1*	*14.5*	*30*	
Surr: Nitrobenzene-d5	*171.5*	*0*	*165.9*	*0*	*103*	*37 - 125*	*133.5*	*24.9*	*30*	

The following samples were analyzed in this batch:

HS20060975-01	HS20060975-02	HS20060975-03	HS20060975-04
HS20060975-05	HS20060975-06	HS20060975-07	HS20060975-08
HS20060975-09	HS20060975-10	HS20060975-11	HS20060975-12

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20060975

QC BATCH REPORT

Batch ID: R363651 (0) **Instrument: VOA5** **Method: VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKS1-062220** Units: **ug/Kg** Analysis Date: **22-Jun-2020 09:05**
Client ID: Run ID: **VOA5_363651** SeqNo: **5629085** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	5.0								
Ethylbenzene	U	5.0								
Xylenes, Total	U	5.0								
Surr: 1,2-Dichloroethane-d4	*42.07*	*0*	*50*	*0*	*84.1*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*49.24*	*0*	*50*	*0*	*98.5*	*80 - 120*				
Surr: Dibromofluoromethane	*44.44*	*0*	*50*	*0*	*88.9*	*80 - 119*				
Surr: Toluene-d8	*49.12*	*0*	*50*	*0*	*98.2*	*81 - 118*				

LCS Sample ID: **VLCSS1-062220** Units: **ug/Kg** Analysis Date: **22-Jun-2020 08:14**
Client ID: Run ID: **VOA5_363651** SeqNo: **5629084** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	50.67	5.0	50	0	101	75 - 124				
Ethylbenzene	51.23	5.0	50	0	102	70 - 123				
Xylenes, Total	154.1	5.0	150	0	103	77 - 128				
Surr: 1,2-Dichloroethane-d4	*44.11*	*0*	*50*	*0*	*88.2*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*50.24*	*0*	*50*	*0*	*100*	*80 - 120*				
Surr: Dibromofluoromethane	*47.24*	*0*	*50*	*0*	*94.5*	*80 - 119*				
Surr: Toluene-d8	*48.96*	*0*	*50*	*0*	*97.9*	*81 - 118*				

MS Sample ID: **HS20060930-04MS** Units: **ug/Kg** Analysis Date: **22-Jun-2020 12:00**
Client ID: Run ID: **VOA5_363651** SeqNo: **5629560** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	39.11	4.9	49	0	79.8	70 - 130				
Ethylbenzene	39.3	4.9	49	0	80.2	70 - 130				
Xylenes, Total	117.7	4.9	147	0	80.1	70 - 130				
Surr: 1,2-Dichloroethane-d4	*43.57*	*0*	*49*	*0*	*88.9*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*49.22*	*0*	*49*	*0*	*100*	*70 - 130*				
Surr: Dibromofluoromethane	*47.37*	*0*	*49*	*0*	*96.7*	*70 - 130*				
Surr: Toluene-d8	*48.8*	*0*	*49*	*0*	*99.6*	*70 - 130*				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20060975

QC BATCH REPORT

Batch ID: R363651 (0) **Instrument: VOA5** **Method: VOLATILES BY SW8260C**

MSD Sample ID: **HS20060930-04MSD** Units: **ug/Kg** Analysis Date: **22-Jun-2020 12:25**
Client ID: Run ID: **VOA5_363651** SeqNo: **5629561** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Benzene	40.6	4.8	48.5	0	83.7	70 - 130	39.11	3.72	30	
Ethylbenzene	40.81	4.8	48.5	0	84.1	70 - 130	39.3	3.76	30	
Xylenes, Total	122.4	4.8	145.5	0	84.1	70 - 130	117.7	3.94	30	
Surr: 1,2-Dichloroethane-d4	*43.93*	*0*	*48.5*	*0*	*90.6*	*70 - 126*	*43.57*	*0.825*	*30*	
Surr: 4-Bromofluorobenzene	*48.99*	*0*	*48.5*	*0*	*101*	*70 - 130*	*49.22*	*0.471*	*30*	
Surr: Dibromofluoromethane	*46.85*	*0*	*48.5*	*0*	*96.6*	*70 - 130*	*47.37*	*1.1*	*30*	
Surr: Toluene-d8	*47.88*	*0*	*48.5*	*0*	*98.7*	*70 - 130*	*48.8*	*1.9*	*30*	

The following samples were analyzed in this batch: HS20060975-01 HS20060975-02 HS20060975-03 HS20060975-04 HS20060975-05

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20060975

QC BATCH REPORT

Batch ID: R363717 (0) **Instrument: VOA5** **Method: VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKS2-062220** Units: **ug/Kg** Analysis Date: **22-Jun-2020 21:33**
Client ID: Run ID: **VOA5_363717** SeqNo: **5630483** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	5.0								
Ethylbenzene	U	5.0								
Xylenes, Total	U	5.0								
Surr: 1,2-Dichloroethane-d4	*42.45*	*0*	*50*	*0*	*84.9*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*49.52*	*0*	*50*	*0*	*99.0*	*80 - 120*				
Surr: Dibromofluoromethane	*45.44*	*0*	*50*	*0*	*90.9*	*80 - 119*				
Surr: Toluene-d8	*50.86*	*0*	*50*	*0*	*102*	*81 - 118*				

LCS Sample ID: **VLCSS2-062220** Units: **ug/Kg** Analysis Date: **22-Jun-2020 20:43**
Client ID: Run ID: **VOA5_363717** SeqNo: **5630482** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	54.69	5.0	50	0	109	75 - 124				
Ethylbenzene	54.34	5.0	50	0	109	70 - 123				
Xylenes, Total	162	5.0	150	0	108	77 - 128				
Surr: 1,2-Dichloroethane-d4	*46.7*	*0*	*50*	*0*	*93.4*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*50.61*	*0*	*50*	*0*	*101*	*80 - 120*				
Surr: Dibromofluoromethane	*49.48*	*0*	*50*	*0*	*99.0*	*80 - 119*				
Surr: Toluene-d8	*49.76*	*0*	*50*	*0*	*99.5*	*81 - 118*				

MS Sample ID: **HS20060992-02MS** Units: **ug/Kg** Analysis Date: **22-Jun-2020 23:13**
Client ID: Run ID: **VOA5_363717** SeqNo: **5630487** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	43.55	4.9	49	0	88.9	70 - 130				
Ethylbenzene	40.23	4.9	49	0	82.1	70 - 130				
Xylenes, Total	117.4	4.9	147	0	79.9	70 - 130				
Surr: 1,2-Dichloroethane-d4	*43.57*	*0*	*49*	*0*	*88.9*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*49.53*	*0*	*49*	*0*	*101*	*70 - 130*				
Surr: Dibromofluoromethane	*46.6*	*0*	*49*	*0*	*95.1*	*70 - 130*				
Surr: Toluene-d8	*49.92*	*0*	*49*	*0*	*102*	*70 - 130*				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20060975

QC BATCH REPORT

Batch ID: R363717 (0) **Instrument: VOA5** **Method: VOLATILES BY SW8260C**

MSD Sample ID: **HS20060992-02MSD** Units: **ug/Kg** Analysis Date: **22-Jun-2020 23:38**
Client ID: Run ID: **VOA5_363717** SeqNo: **5630488** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	40.53	4.8	48.5	0	83.6	70 - 130	43.55	7.19	30	
Ethylbenzene	36.69	4.8	48.5	0	75.7	70 - 130	40.23	9.2	30	
Xylenes, Total	107.1	4.8	145.5	0	73.6	70 - 130	117.4	9.19	30	
Surr: 1,2-Dichloroethane-d4	*43.1*	*0*	*48.5*	*0*	*88.9*	*70 - 126*	*43.57*	*1.08*	*30*	
Surr: 4-Bromofluorobenzene	*48.7*	*0*	*48.5*	*0*	*100*	*70 - 130*	*49.53*	*1.68*	*30*	
Surr: Dibromofluoromethane	*46.76*	*0*	*48.5*	*0*	*96.4*	*70 - 130*	*46.6*	*0.336*	*30*	
Surr: Toluene-d8	*49.42*	*0*	*48.5*	*0*	*102*	*70 - 130*	*49.92*	*1*	*30*	

The following samples were analyzed in this batch: HS20060975-06 HS20060975-07 HS20060975-08 HS20060975-09
HS20060975-10 HS20060975-11 HS20060975-12

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS20060975

QC BATCH REPORT

Batch ID: **R364091 (0)** **Instrument:** **Balance1** **Method:** **MOISTURE - ASTM D2216**

DUP Sample ID: **HS20060975-07DUP** Units: **wt%** Analysis Date: **27-Jun-2020 09:00**
Client ID: **SO-1620-SG24(0.5-1)20200618** Run ID: **Balance1_364091** SeqNo: **5640593** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Percent Moisture	14	0.0100					14.4	2.82	20	

The following samples were analyzed in this batch:

HS20060975-01	HS20060975-02	HS20060975-03	HS20060975-04
HS20060975-05	HS20060975-06	HS20060975-07	HS20060975-08
HS20060975-09	HS20060975-10	HS20060975-11	HS20060975-12

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: **HS20060975**

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/Kg-dry	Milligrams per Kilogram- Dry weight corrected

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	20-030-0	26-Mar-2021
Dept of Defense	ANAB L2231 V009	22-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322020-4	09-May-2021
Kansas	E-10352 2019-2020	31-Jul-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-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: HS20060975 **Date/Time Received:** **19-Jun-2020 13:00**

Client Name: PBW **Received by:** **Patrick Salome**

Completed By: */S/ Paresh M. Giga* (eSignature) 19-Jun-2020 16:12 (Date/Time) **Reviewed by:** */S/ Dane J. Wacasey* (eSignature) 26-Jun-2020 18:28 (Date/Time)

Matrices: **Soil** 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:218812/218809
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):	1.5°C; 1.1°C uc/c	IR25
Cooler(s)/Kit(s):	45140/46069	
Date/Time sample(s) sent to storage:	6/19/2020 16:30	

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: Times Differ : SG-24(5.5-6): COC = 15:50 Labels = 15:00; logged per COC.
SG25(0.5-1): 5035 VOC methanol vial received empty

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
Houston, TX +1 281 530 5656
Middletown, PA +1 717 944 5541
Spring City, PA +1 610 948 4903
Salt Lake City, UT +1 801 266 7700
South Charleston, WV +1 304 356 3168
York, PA +1 717 505 5280

Chain of Custody Form

Page _____ of _____

COC ID: 218812

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works	A	8260_S (5652652 *5035*8260 - B,E,X)
Work Order		Project Number	1620-18-Rev0 SR 92688	B	8270_LOW_S (5635942 SVOC - Naphthalene only)
Company Name	Golder Associates Inc.	Bill To Company	Union Pacific Railroad- A/P	C	MOIST_ASTM (5631931 Gen.Chem. MOIST%)
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	

ALS Project Manager: | ALS Work Order #:

HS20060975
Golder Associates Inc.
Houston TX-Wood Preserving Works

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	SO-1620-SG125(0.5-1')20200618	6-18-20	0830	Soil	8.9	5	X	X	X								
2	SG125(5.5-6')		0858														
3	SG13R(0.5-1)		1000														
4	SG13R(5.5-6)		1030														
5	SG23(0.5-1)		1308														
6	SG23(5.5-6)		1330														
7	SG24(0.5-1)		1449														
8	SG24(5.5-6)		1550														
9	SG26(0.5-1)20200619	6-19-20	0915														
10	SG26(5.5-6)		0752														

Sampler(s) Please Print & Sign: Anthony Reid

Shipment Method:

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

Results Due Date:

	Date:	Time:	
Relinquished by:	6-19-20	1215	Received by:
Relinquished by:	6-19-20	1300	Received by (Laboratory):
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes: UPRR HWPW 1620-18

Cooler ID	Cooler Temp. (°C)
45140	1.5
46069	1.1

QC Package: (Check One Box Below)
☐ Level II Std QC
☐ Level III Std QC/Raw Data
☐ Level IV SW846/CLP
☐ Other
☒ 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.

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
Houston, TX +1 281 530 5656
Middletown, PA +1 717 944 5541
Spring City, PA +1 610 948 4903
Salt Lake City, UT +1 801 266 7700
South Charleston, WV +1 304 356 3168
York, PA +1 717 505 5280

Chain of Custody Form

Page _____ of _____

COC ID: 218809

ALS Project Manager: | ALS Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works	A	8260_S (5652652 *5035*8260 - B,E,X)
Work Order		Project Number	1620-18-Rev0 SR 92688	B	8270_LOW_S (5635942 SVOC - Naphthalene only)
Company Name	Golder Associates Inc.	Bill To Company	Union Pacific Railroad- A/P	C	MOIST_ASTM (5631931 Gen.Chem. MOIST%)
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	

HS20060975
Golder Associates Inc.
Houston TX-Wood Preserving Works

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	SO-1620-SG27(0.5-1)20200619	6-19-20	1010	Soil	8,9	5	X	X	X								
2	1 1 SG27(5.5-6)20200619	1	1030	1	1	1	X	X	X								
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Anthony Reed

Shipment Method:

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

Results Due Date:

	Date:	Time:	
Relinquished by:	6-19-20	1213	Received by:
Relinquished by:	6-19-20	1300	Received by (Laboratory):
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes: UPRR HWPW 1620-18

Cooler ID	Cooler Temp.

QC Package: (Check One Box Below)
☐ Level II Std QC
☐ Level III Std QC/Raw Data
☐ Level IV SW846/CLP
☐ Other
☒ 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.

ATTACHMENT 2

Soil Gas Samples - Data Usability Summary and Laboratory Analytical Reports

Memorandum

March 27, 2020

To:	Eric Matzner	Ref. No.:	11183954-1620
From:	Chris G. Knight/eew/577-NF	Tel:	512-506-8803
cc:	Jesse Orth, Jon Lang; Julie Lidstone		

Subject: **Data Usability Summary**
Soil Gas Sampling Event
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works
Houston, Texas
February 2020

1. Scope of Data Usability Study

This document details a Data Usability Summary (DUS) of analytical results for soil gas samples collected in support of the Soil Gas Sampling Event at the Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works site during February 2020. Samples were submitted to Pace Analytical Services, Inc., located in Minneapolis, Minnesota and are reported in data packages 10509381 and 10510405. The intended use of the data is to support the Soil Gas Sampling 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 laboratory control samples (LCS)/ duplicate analyses (DUP), field quality assurance/quality control samples (QA/QC), the laboratory review checklists (LRC), and the laboratory exception reports (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 # TX104704192 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 duplicate sample sets 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 duplicate analyses.

4. Data Review/Validation Results

4.1 Sample Holding Time

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

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

4.2 Sample Containers

All sample canisters were received at the laboratory in good condition and within acceptable canister pressure range of –1 inch of mercury (Hg) to –10 inches of Hg, indicating samples were still under vacuum upon receipt.

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 packages.

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 packages.

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 with the following exception (see Table 4):

i) One method blank yielded a low level detection for naphthalene. Associated non-detect sample results were not affected. No further action was required. Associated sample results with similar detections to the method blank were qualified as non-detect.

4.5 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.

4.6 Duplicate Sample Analyses

Analytical precision is evaluated based on the analysis of laboratory duplicate samples. For this study, a duplicate analysis was prepared and analyzed by the laboratory as specified in Table 1. The relative percent differences (RPD) established by the laboratory are adopted as the acceptance criteria for the project.

The duplicate analysis performed was acceptable, demonstrating acceptable analytical precision.

The laboratory also performed am additional duplicate analysis on a non-site sample. This cannot be used to assess precision for the site samples.

4.7 Field QA/QC Samples

The field QA/QC consisted of two field duplicate sample sets.

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 fifty percent for soil 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.

4.8 Field Procedures

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

4.9 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 Soil Gas Sampling Event at the site by providing current concentration of chemicals of concern in soil gas samples with the specific qualifications noted herein.

Table 1

Sample Collection and Analysis Summary
Soil Gas Sampling Event
Union Pacific Railroad (UPRR)/Houston, TX-Wood Preserving Works
Houston, Texas
February 2020

						Analysis/Parameters	
Work Order	**Sample Identification**	**Location**	**Matrix**	**Collection Date (mm/dd/yyyy)**	**Collection Time (hr:min)**	**VOCs**	**Comments**
10509381	GS-1620-SG-22-20200219	SG22	Soil Gas	02/19/2020	08:24	X	
	GS-1620-SG-22-20200219 CERT#31	SG22	Soil Gas	02/19/2020	08:24	X	
	GS-1620-DUP-1-20200219	SG21	Soil Gas	02/19/2020	08:30	X	Field duplicate of SG-21
	GS-1620-DUP-1-20200219 CERT#24	SG21	Soil Gas	02/19/2020	08:30	X	
	GS-1620-SG-21-20200219	SG21	Soil Gas	02/19/2020	08:40	X	
	GS-1620-SG-21-20200219 CERT#20	SG21	Soil Gas	02/19/2020	08:40	X	
	GS-1620-SG-18-20200219	SG18	Soil Gas	02/19/2020	09:16	X	
	GS-1620-SG-18-20200219 CERT#25	SG18	Soil Gas	02/19/2020	09:16	X	
	GS-1620-AA-1-20200219	AA01	Soil Gas	02/19/2020	09:50	X	
	GS-1620-AA-1-20200219 CERT#008	AA01	Soil Gas	02/19/2020	09:50	X	
	GS-1620-SG-11-20200219	SG11	Soil Gas	02/19/2020	10:07	X	
	GS-1620-SG-11-20200219 CERT#30	SG11	Soil Gas	02/19/2020	10:07	X	
	GS-1620-SG-10-20200219	SG10	Soil Gas	02/19/2020	10:22	X	
	GS-1620-SG-10-20200219 CERT#29	SG10	Soil Gas	02/19/2020	10:22	X	
	GS-1620-SG-8-20200219	SG08	Soil Gas	02/19/2020	10:44	X	
	GS-1620-SG-8-20200219 CERT#328	SG08	Soil Gas	02/19/2020	10:44	X	
	GS-1620-HE-1-20200219	HE01	Soil Gas	02/19/2020	11:10	X	
	GS-1620-HE-1-20200219 CERT#251	HE01	Soil Gas	02/19/2020	11:10	X	

Table 1

Sample Collection and Analysis Summary
Soil Gas Sampling Event
Union Pacific Railroad (UPRR)/Houston, TX-Wood Preserving Works
Houston, Texas
February 2020

						Analysis/Parameters	
Work Order	**Sample Identification**	**Location**	**Matrix**	**Collection Date (mm/dd/yyyy)**	**Collection Time (hr:min)**	**VOCs**	**Comments**
10510405	GS-1620-SG20-20200227	SG20	Soil Gas	02/27/2020	09:23	X	
	GS-1620-SG20-20200227Cert#1329	SG20	Soil Gas	02/27/2020	09:23	X	
	GS-1620-SG19-20200227	SG19	Soil Gas	02/27/2020	09:45	X	
	GS-1620-SG19-20200227Cert#2897	SG19	Soil Gas	02/27/2020	09:45	X	
	AA-1620-AA-2-20200227	AA02	Soil Gas	02/27/2020	09:49	X	DUP
	AA-1620-AA-2-20200227Cert#2829	AA02	Soil Gas	02/27/2020	09:49	X	
	GS-1620-SG17-20200227	SG17	Soil Gas	02/27/2020	10:11	X	
	GS-1620-SG17-20200227Cert#2597	SG17	Soil Gas	02/27/2020	10:11	X	
	GS-1620-SG16-20200227	SG16	Soil Gas	02/27/2020	10:49	X	
	GS-1620-DUP-2-20200227	SG16	Soil Gas	02/27/2020	10:49	X	Field duplicate of SG16
	GS-1620-SG16-20200227Cert#2922	SG16	Soil Gas	02/27/2020	10:49	X	
	GS-1620-DUP2-20200227Cert#0882	SG16	Soil Gas	02/27/2020	10:49	X	
	GS-1620-SG15-20200227	SG15	Soil Gas	02/27/2020	11:20	X	
	GS-1620-SG15-20200227Cert#2937	SG15	Soil Gas	02/27/2020	11:20	X	
	GS-1620-SG14-20200227	SG14	Soil Gas	02/27/2020	11:39	X	
	GS-1620-SG14-20200227Cert#3239	SG14	Soil Gas	02/27/2020	11:39	X	
	GS-1620-SG12-20200227	SG12	Soil Gas	02/27/2020	12:21	X	
	GS-1620-SG12-20200227Cert#3264	SG12	Soil Gas	02/27/2020	12:27	X	

Notes:

VOCs - Volatile Organic Compounds
DUP - Laboratory Duplicate

Table 2

Analytical Results Summary
Soil Gas Sampling Event
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works
Houston, Texas
February 2020

Location ID:		AA01	AA01	AA02	AA02	HE01
Sample Name:		GS-1620-AA-1-20200219	GS-1620-AA-1-20200219 CERT#008	AA-1620-AA-2-20200227	AA-1620-AA-2-20200227Cert#2829	GS-1620-HE-1-20200219
Sample Date:		02/19/2020	02/19/2020	02/27/2020	02/27/2020	02/19/2020
Parameters	**Unit**					
Volatile Organic Compounds						
Benzene	µg/m3	0.73	<0.076	1.1	<0.076	5.6
Ethylbenzene	µg/m3	<0.38	<0.15	<0.37	<0.15	3.8
m&p-Xylenes	µg/m3	<0.88	<0.35	0.99 J	<0.35	22.0
Naphthalene	µg/m3	<1.7	<0.66	<1.6	<0.66	<1.3
o-Xylene	µg/m3	<0.43	<0.17	<0.42	<0.17	21.2

Table 2

Analytical Results Summary
Soil Gas Sampling Event
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works
Houston, Texas
February 2020

Location ID:		HE01	SG08	SG08	SG10	SG10
Sample Name:		GS-1620-HE-1-20200219 CERT#251	GS-1620-SG-8-20200219	GS-1620-SG-8-20200219 CERT#328	GS-1620-SG-10-20200219	GS-1620-SG-10-20200219 CERT#29
Sample Date:		02/19/2020	02/19/2020	02/19/2020	02/19/2020	02/19/2020
Parameters	**Unit**					
Volatile Organic Compounds						
Benzene	µg/m3	<0.15	0.31 J	<0.15	<0.26	<0.15
Ethylbenzene	µg/m3	<0.30	0.63 J	<0.30	0.54 J	<0.30
m&p-Xylenes	µg/m3	<0.70	2.4 J	<0.70	2.1 J	<0.70
Naphthalene	µg/m3	<1.3	<2.3	<1.3	<2.2	<1.3
o-Xylene	µg/m3	<0.34	0.81 J	<0.34	0.69 J	<0.34

Table 2

Analytical Results Summary
Soil Gas Sampling Event
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works
Houston, Texas
February 2020

Location ID:		SG11	SG11	SG12	SG12	SG14
Sample Name:		GS-1620-SG-11-20200219	GS-1620-SG-11-20200219 CERT#30	GS-1620-SG12-20200227	GS-1620-SG12-20200227Cert#3264	GS-1620-SG14-20200227
Sample Date:		02/19/2020	02/19/2020	02/27/2020	02/27/2020	02/27/2020
Parameters	**Unit**					
Volatile Organic Compounds						
Benzene	µg/m3	0.87	<0.15	0.28 J	<0.15	<0.27
Ethylbenzene	µg/m3	5.1	<0.30	<0.54	<0.30	<0.54
m&p-Xylenes	µg/m3	13.1	<0.70	1.3 J	<0.70	<1.2
Naphthalene	µg/m3	3.8 J	<1.3	<3.1	<1.3	<2.3
o-Xylene	µg/m3	7.6	<0.34	<0.61	<0.34	<0.61

Table 2

Analytical Results Summary
Soil Gas Sampling Event
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works
Houston, Texas
February 2020

Location ID:		SG14	SG15	SG15	SG16	SG16
Sample Name:		GS-1620-SG14-20200227Cert#3239	GS-1620-SG15-20200227	GS-1620-SG15-20200227Cert#2937	GS-1620-SG16-20200227	GS-1620-SG16-20200227Cert#2922
Sample Date:		02/27/2020	02/27/2020	02/27/2020	02/27/2020	02/27/2020
Parameters	**Unit**					
Volatile Organic Compounds						
Benzene	µg/m3	<0.15	<0.26	<0.15	<0.26	<0.15
Ethylbenzene	µg/m3	<0.30	<0.51	<0.30	13.4	<0.30
m&p-Xylenes	µg/m3	<0.70	<1.2	<0.70	46.9	<0.70
Naphthalene	µg/m3	<1.3	<3.4	<1.3	<3.1	<1.3
o-Xylene	µg/m3	<0.34	<0.58	<0.34	20.9	<0.34

Table 2

Analytical Results Summary
Soil Gas Sampling Event
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works
Houston, Texas
February 2020

Location ID:		SG16	SG16	SG17	SG17	SG18
Sample Name:		GS-1620-DUP-2-20200227	GS-1620-DUP2-20200227Cert#0882	GS-1620-SG17-20200227	GS-1620-SG17-20200227Cert#2597	GS-1620-SG-18-20200219
Sample Date:		02/27/2020	02/27/2020	02/27/2020	02/27/2020	02/19/2020
		Duplicate				
Parameters	**Unit**					
Volatile Organic Compounds						
Benzene	µg/m3	0.58	<0.15	0.25 J	<0.15	1.0
Ethylbenzene	µg/m3	14.0	<0.30	<0.48	<0.30	3.9
m&p-Xylenes	µg/m3	50.6	<0.70	1.1 J	<0.70	8.0
Naphthalene	µg/m3	<3.2	<1.3	<3.0	<1.3	<2.2
o-Xylene	µg/m3	21.5	<0.34	<0.54	<0.34	3.7

Table 2

Analytical Results Summary
Soil Gas Sampling Event
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works
Houston, Texas
February 2020

Location ID:		**SG18**	**SG19**	**SG19**	**SG20**
Sample Name:		**GS-1620-SG-18-20200219 CERT#25**	**GS-1620-SG19-20200227**	**GS-1620-SG19-20200227Cert#2897**	**GS-1620-SG20-20200227**
Sample Date:		**02/19/2020**	**02/27/2020**	**02/27/2020**	**02/27/2020**
Parameters	**Unit**				
Volatile Organic Compounds					
Benzene	µg/m3	<0.15	0.46 J	<0.15	0.27 J
Ethylbenzene	µg/m3	<0.30	<0.51	<0.30	<0.53
m&p-Xylenes	µg/m3	<0.70	1.6 J	<0.70	1.7 J
Naphthalene	µg/m3	<1.3	<3.5	<1.3	<3.1
o-Xylene	µg/m3	<0.34	0.91 J	<0.34	<0.60

Table 2

Analytical Results Summary
Soil Gas Sampling Event
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works
Houston, Texas
February 2020

Location ID:		**SG20**	**SG21**	**SG21**	**SG21**
Sample Name:		**GS-1620-SG20-20200227Cert#1329**	**GS-1620-SG-21-20200219**	**GS-1620-SG-21-20200219 CERT#20**	**GS-1620-DUP-1-20200219**
Sample Date:		**02/27/2020**	**02/19/2020**	**02/19/2020**	**02/19/2020**
					Duplicate
Parameters	**Unit**				
Volatile Organic Compounds					
Benzene	µg/m3	0.21 J	<0.26	<0.15	<0.26
Ethylbenzene	µg/m3	<0.30	<0.51	<0.30	<0.51
m&p-Xylenes	µg/m3	<0.70	<1.2	<0.70	<1.2
Naphthalene	µg/m3	<1.3	<2.2	<1.3	<2.2
o-Xyne	µg/m3	<0.34	<0.58	<0.34	<0.58

Table 2

Analytical Results Summary
Soil Gas Sampling Event
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works
Houston, Texas
February 2020

Location ID:		**SG21**	**SG22**	**SG22**
Sample Name:		**GS-1620-DUP-1-20200219 CERT#24**	**GS-1620-SG-22-20200219**	**GS-1620-SG-22-20200219 CERT#31**
Sample Date:		**02/19/2020**	**02/19/2020**	**02/19/2020**
Parameters	**Unit**			
Volatile Organic Compounds				
Benzene	µg/m3	<0.15	<0.26	<0.15
Ethylbenzene	µg/m3	<0.30	0.82 J	<0.30
m&p-Xylenes	µg/m3	<0.70	2.5 J	<0.70
Naphthalene	µg/m3	<1.3	<2.2	<1.3
o-Xylene	µg/m3	<0.34	0.81 J	<0.34

Notes:

< - Not detected at the associated reporting limit
J - Estimated concentration

Table 3

Analytical Methods
Soil Gas Sampling Event
Union Pacific Railroad (UPRR)/Houston, TX-Wood Preserving Works
Houston, Texas
February 2020

Parameter	Method	Matrix	Holding Time Collection to Analysis (Days)
VOCs	TO-15 [(1)]	Soil Gas	30

Notes:

VOCs - Volatile Organic Compounds

Method References:

(1) - Referenced from "Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air", January 1999

Table 4

Qualified Sample Results Due to Analyte Concentrations in the Method Blank
Soil Gas Sampling Event
Union Pacific Railroad (UPRR)/Houston, TX-Wood Preserving Works
Houston, Texas
February 2020

Parameter	Analyte	Analysis Date (mm/dd/yyyy)	Blank Result	Sample ID	Original Result	Qualified Result	Units
VOCs	Naphthalene	03/08/2020	1.7 J	GS-1620-SG12-20200227	3.1 J	<3.1	µg/m3
				GS-1620-SG15-20200227	3.4 J	<3.4	µg/m3
				GS-1620-SG16-20200227	3.1 J	<3.1	µg/m3
				GS-1620-DUP-2-20200227	3.2 J	<3.2	µg/m3
				GS-1620-SG17-20200227	3.0 J	<3.0	µg/m3
				GS-1620-SG19-20200227	3.5 J	<3.5	µg/m3
				GS-1620-SG20-20200227	3.1 J	<3.1	µg/m3

Notes:

VOCs - Volatile Organic Compounds
J - Estimated concentration
< - Not detected at the associated reporting limit

Attachment A
Laboratory NELAP Certificate

Texas Commission on Environmental Quality

NELAP-Recognized Laboratory Accreditation is hereby awarded to

Pace Analytical Services, LLC - Minneapolis MN

1700 Elm Street SE Suite 200
Minneapolis, MN 55414-2485

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: T104704192-20-15
Effective Date: 3/1/2020
Expiration Date: 2/28/2021

Executive Director Texas Commission on Environmental Quality

Pace Analytical Services, Inc.
1700 Elm St SE, Suite 200
Minneapolis, MN 55414
(612) 607-1700

March 13, 2020

Michelle Hermiston
Golder
2201 Double Creek Dr
Suite 4004
Round Rock, TX 78664

RE: Pace Project 10509381
Project ID: Houston TX-Wood: 1620-01-Rev1

Dear Michelle Hermiston:

Enclosed are the analytical results for sample(s) received by the laboratory on February 21, 2020. Results reported herin conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

This report was revised on March, 13, 2020 to create TRRP report.

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

Sincerely,

Nathan Boberg
nathan.boberg@pacelabs.com
(612)360-0728

Laboratory Certifications

Pace Analytical Minnesota : Texas Certification #: T104704192

REPORT OF LABORATORY ANALYSIS

03/13/2020 11:19:06

Pace Analytical Services, Inc.
1700 Elm St SE, Suite 200
Minneapolis, MN 55414
(612) 607-1700

Pace Project 10509381

Client: UPRR_Golder
Project ID: Houston TX-Wood: 1620-01-Rev1

Client Sample ID	Lab ID	Matrix	Collection Date/Time	Received Date/Time
GS-1620-SG-8-20200219	10509381001	Air	02/19/2020 10:44	02/21/2020 10:00
GS-1620-SG-8-20200219 CERT#328	10509381002	Air	02/19/2020 10:44	02/21/2020 10:00
GS-1620-SG-10-20200219	10509381003	Air	02/19/2020 10:22	02/21/2020 10:00
GS-1620-SG-10-20200219 CERT#29	10509381004	Air	02/19/2020 10:22	02/21/2020 10:00
GS-1620-SG-11-20200219	10509381005	Air	02/19/2020 10:07	02/21/2020 10:00
GS-1620-SG-11-20200219 CERT#30	10509381006	Air	02/19/2020 10:07	02/21/2020 10:00
GS-1620-SG-18-20200219	10509381007	Air	02/19/2020 09:16	02/21/2020 10:00
GS-1620-SG-18-20200219 CERT#25	10509381008	Air	02/19/2020 09:16	02/21/2020 10:00
GS-1620-SG-21-20200219	10509381009	Air	02/19/2020 08:40	02/21/2020 10:00
GS-1620-SG-21-20200219 CERT#20	10509381010	Air	02/19/2020 08:40	02/21/2020 10:00
GS-1620-SG-22-20200219	10509381011	Air	02/19/2020 08:24	02/21/2020 10:00
GS-1620-SG-22-20200219 CERT#31	10509381012	Air	02/19/2020 08:24	02/21/2020 10:00
GS-1620-AA-1-20200219	10509381013	Air	02/19/2020 09:50	02/21/2020 10:00
GS-1620-AA-1-20200219 CERT#008	10509381014	Air	02/19/2020 09:50	02/21/2020 10:00
GS-1620-HE-1-20200219	10509381015	Air	02/19/2020 11:10	02/21/2020 10:00
GS-1620-HE-1-20200219 CERT#251	10509381016	Air	02/19/2020 11:10	02/21/2020 10:00
GS-1620-DUP-1-20200219	10509381017	Air	02/19/2020 08:30	02/21/2020 10:00
GS-1620-DUP-1-20200219 CERT#24	10509381018	Air	02/19/2020 08:30	02/21/2020 10:00

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Pace Project 10509381

Holding Times:

All holding times were met.

Blanks:

All blank results were below reporting limits.

Laboratory Control Samples:

All LCS recoveries were within QC limits.

Matrix Spikes and Duplicates:

All MS or MSD recoveries were within QC limits.

Surrogate:

All surrogate recoveries were within QC limits.

Appendix A
LABORATORY DATA PACKAGE COVER PAGE

This data package is for Job No. 10509381 and consists of:

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

[X] R1 - Field chain-of-custody documentation;

[X] R2 - Sample identification cross-reference;

[X] 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).

[X] R4 - Surrogate recovery data including:

a. Calculated recovery (%R), and

b. The laboratory's surrogate QC limits.

[X] R5 - Test reports/summary forms for blank samples;

[X] 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.

[X] R7 - Test reports/summary forms for 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, and

e. The laboratory's MS/MSD QC limits.

[X] 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 duplicated.

[X] R9 - List of method quantitation limits (MQLs) and detectability check sample results for each analyte and

[X] R10 - Other problems or anomalies.

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

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 Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [ ] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [X] MDH on 04/12/2011

Any findings affecting the data in this laboratory data package are noted in the Exception Reports herin. 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.

Name (Printed)	Signature	Official Title (Printed)	Date
Nathan Boberg		Project Manager	03/13/2020

Pace Analytical Services, Inc.
1700 Elm St SE, Suite 200
Minneapolis, MN 55414
(612) 607-1700

Client: UPRR_Golder

Client ID: GS-1620-SG-8-20200219 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10509381001 **Moisture:** N/A **Pace Project** 10509381
Collected: 02/19/2020 10:44 **Received** 02/21/2020 10:00 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
TO15 MSV AIR	Analytical Method: TO-15									
Benzene	1.74	**0.31**	J	ug/m3	0.57	0.27	02/22/2020 02:27		661381	10AIRD
Ethylbenzene	1.74	**0.63**	J	ug/m3	1.5	0.53	02/22/2020 02:27		661381	10AIRD
Naphthalene	1.74	< 2.3	U	ug/m3	4.6	2.3	02/22/2020 02:27		661381	10AIRD
m&p-Xylene	1.74	**2.4**	J	ug/m3	3.1	1.2	02/22/2020 02:27		661381	10AIRD
o-Xylene	1.74	**0.81**	J	ug/m3	1.5	0.60	02/22/2020 02:27		661381	10AIRD

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Client: UPRR_Golder

Client ID: GS-1620-SG-8-20200219 CERT#328 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10509381002 **Moisture:** N/A **Pace Project** 10509381
Collected: 02/19/2020 10:44 **Received** 02/21/2020 10:00 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
Individual Can Certification	Analytical Method: TO-15									
Benzene	1	< 0.15	U	ug/m3	0.32	0.15	01/15/2020 17:12		662198	10AIRI
Ethylbenzene	1	< 0.30	U	ug/m3	0.88	0.30	01/15/2020 17:12		662198	10AIRI
Naphthalene	1	< 1.3	U	ug/m3	2.7	1.3	01/15/2020 17:12		662198	10AIRI
m&p-Xylene	1	< 0.70	U	ug/m3	1.8	0.70	01/15/2020 17:12		662198	10AIRI
o-Xylene	1	< 0.34	U	ug/m3	0.88	0.34	01/15/2020 17:12		662198	10AIRI

Pace Analytical Services, Inc.
1700 Elm St SE, Suite 200
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Client: UPRR_Golder

Client ID: GS-1620-SG-10-20200219 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10509381003 **Moisture:** N/A **Pace Project** 10509381
Collected: 02/19/2020 10:22 **Received** 02/21/2020 10:00 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
TO15 MSV AIR	Analytical Method: TO-15									
Benzene	1.68	< 0.26	U	ug/m3	0.55	0.26	02/22/2020 00:04		661381	10AIRD
Ethylbenzene	1.68	**0.54**	J	ug/m3	1.5	0.51	02/22/2020 00:04		661381	10AIRD
Naphthalene	1.68	< 2.2	U	ug/m3	4.5	2.2	02/22/2020 00:04		661381	10AIRD
m&p-Xylene	1.68	**2.1**	J	ug/m3	3.0	1.2	02/22/2020 00:04		661381	10AIRD
o-Xylene	1.68	**0.69**	J	ug/m3	1.5	0.58	02/22/2020 00:04		661381	10AIRD

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Client: UPRR_Golder

Client ID: GS-1620-SG-10-20200219 CERT#29 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10509381004 **Moisture:** N/A **Pace Project** 10509381
Collected: 02/19/2020 10:22 **Received** 02/21/2020 10:00 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
Individual Can Certification	Analytical Method: TO-15									
Benzene	1	< 0.15	U	ug/m3	0.32	0.15	01/15/2020 23:46		662198	10AIRI
Ethylbenzene	1	< 0.30	U	ug/m3	0.88	0.30	01/15/2020 23:46		662198	10AIRI
Naphthalene	1	< 1.3	U	ug/m3	2.7	1.3	01/15/2020 23:46		662198	10AIRI
m&p-Xylene	1	< 0.70	U	ug/m3	1.8	0.70	01/15/2020 23:46		662198	10AIRI
o-Xylene	1	< 0.34	U	ug/m3	0.88	0.34	01/15/2020 23:46		662198	10AIRI

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Client: UPRR_Golder

Client ID: GS-1620-SG-11-20200219 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10509381005 **Moisture:** N/A **Pace Project** 10509381
Collected: 02/19/2020 10:07 **Received** 02/21/2020 10:00 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
TO15 MSV AIR	Analytical Method: TO-15									
Benzene	1.74	**0.87**		ug/m3	0.57	0.27	02/22/2020 01:59		661381	10AIRD
Ethylbenzene	1.74	**5.1**		ug/m3	1.5	0.53	02/22/2020 01:59		661381	10AIRD
Naphthalene	1.74	**3.8**	J	ug/m3	4.6	2.3	02/22/2020 01:59		661381	10AIRD
m&p-Xylene	1.74	**13.1**		ug/m3	3.1	1.2	02/22/2020 01:59		661381	10AIRD
o-Xylene	1.74	**7.6**		ug/m3	1.5	0.60	02/22/2020 01:59		661381	10AIRD

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Client: UPRR_Golder

Client ID: GS-1620-SG-11-20200219 CERT#30 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10509381006 **Moisture:** N/A **Pace Project** 10509381
Collected: 02/19/2020 10:07 **Received** 02/21/2020 10:00 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
Individual Can Certification	Analytical Method: TO-15									
Benzene	1	< 0.15	U	ug/m3	0.32	0.15	01/17/2020 20:50		662198	10AIR0
Ethylbenzene	1	< 0.30	U	ug/m3	0.88	0.30	01/17/2020 20:50		662198	10AIR0
Naphthalene	1	< 1.3	U	ug/m3	2.7	1.3	01/17/2020 20:50		662198	10AIR0
m&p-Xylene	1	< 0.70	U	ug/m3	1.8	0.70	01/17/2020 20:50		662198	10AIR0
o-Xylene	1	< 0.34	U	ug/m3	0.88	0.34	01/17/2020 20:50		662198	10AIR0

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Client: UPRR_Golder

Client ID: GS-1620-SG-18-20200219 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10509381007 **Moisture:** N/A **Pace Project** 10509381
Collected: 02/19/2020 09:16 **Received** 02/21/2020 10:00 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
TO15 MSV AIR	Analytical Method: TO-15									
Benzene	1.68	**1.0**		ug/m3	0.55	0.26	02/22/2020 02:56		661381	10AIRD
Ethylbenzene	1.68	**3.9**		ug/m3	1.5	0.51	02/22/2020 02:56		661381	10AIRD
Naphthalene	1.68	< 2.2	U	ug/m3	4.5	2.2	02/22/2020 02:56		661381	10AIRD
m&p-Xylene	1.68	**8.0**		ug/m3	3.0	1.2	02/22/2020 02:56		661381	10AIRD
o-Xylene	1.68	**3.7**		ug/m3	1.5	0.58	02/22/2020 02:56		661381	10AIRD

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Client: UPRR_Golder

Client ID: GS-1620-SG-18-20200219 CERT#25 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10509381008 **Moisture:** N/A **Pace Project** 10509381
Collected: 02/19/2020 09:16 **Received** 02/21/2020 10:00 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
Individual Can Certification	Analytical Method: TO-15									
Benzene	1	< 0.15	U	ug/m3	0.32	0.15	01/17/2020 19:25		662198	10AIR0
Ethylbenzene	1	< 0.30	U	ug/m3	0.88	0.30	01/17/2020 19:25		662198	10AIR0
Naphthalene	1	< 1.3	U	ug/m3	2.7	1.3	01/17/2020 19:25		662198	10AIR0
m&p-Xylene	1	< 0.70	U	ug/m3	1.8	0.70	01/17/2020 19:25		662198	10AIR0
o-Xylene	1	< 0.34	U	ug/m3	0.88	0.34	01/17/2020 19:25		662198	10AIR0

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Client: UPRR_Golder

Client ID: GS-1620-SG-21-20200219 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10509381009 **Moisture:** N/A **Pace Project** 10509381
Collected: 02/19/2020 08:40 **Received** 02/21/2020 10:00 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
TO15 MSV AIR	Analytical Method: TO-15									
Benzene	1.68	< 0.26	U	ug/m3	0.55	0.26	02/22/2020 01:01		661381	10AIRD
Ethylbenzene	1.68	< 0.51	U	ug/m3	1.5	0.51	02/22/2020 01:01		661381	10AIRD
Naphthalene	1.68	< 2.2	U	ug/m3	4.5	2.2	02/22/2020 01:01		661381	10AIRD
m&p-Xylene	1.68	< 1.2	U	ug/m3	3.0	1.2	02/22/2020 01:01		661381	10AIRD
o-Xylene	1.68	< 0.58	U	ug/m3	1.5	0.58	02/22/2020 01:01		661381	10AIRD

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Client: UPRR_Golder

Client ID: GS-1620-SG-21-20200219 CERT#20 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10509381010 **Moisture:** N/A **Pace Project** 10509381
Collected: 02/19/2020 08:40 **Received** 02/21/2020 10:00 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
Individual Can Certification	Analytical Method: TO-15									
Benzene	1	< 0.15	U	ug/m3	0.32	0.15	01/18/2020 01:09		662198	10AIR0
Ethylbenzene	1	< 0.30	U	ug/m3	0.88	0.30	01/18/2020 01:09		662198	10AIR0
Naphthalene	1	< 1.3	U	ug/m3	2.7	1.3	01/18/2020 01:09		662198	10AIR0
m&p-Xylene	1	< 0.70	U	ug/m3	1.8	0.70	01/18/2020 01:09		662198	10AIR0
o-Xylene	1	< 0.34	U	ug/m3	0.88	0.34	01/18/2020 01:09		662198	10AIR0

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Client: UPRR_Golder

Client ID: GS-1620-SG-22-20200219 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10509381011 **Moisture:** N/A **Pace Project** 10509381
Collected: 02/19/2020 08:24 **Received** 02/21/2020 10:00 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
TO15 MSV AIR	Analytical Method: TO-15									
Benzene	1.68	< 0.26	U	ug/m3	0.55	0.26	02/22/2020 01:30		661381	10AIRD
Ethylbenzene	1.68	**0.82**	J	ug/m3	1.5	0.51	02/22/2020 01:30		661381	10AIRD
Naphthalene	1.68	< 2.2	U	ug/m3	4.5	2.2	02/22/2020 01:30		661381	10AIRD
m&p-Xylene	1.68	**2.5**	J	ug/m3	3.0	1.2	02/22/2020 01:30		661381	10AIRD
o-Xylene	1.68	**0.81**	J	ug/m3	1.5	0.58	02/22/2020 01:30		661381	10AIRD

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Client: UPRR_Golder

Client ID: GS-1620-SG-22-20200219 CERT#31 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10509381012 **Moisture:** N/A **Pace Project** 10509381
Collected: 02/19/2020 08:24 **Received** 02/21/2020 10:00 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
Individual Can Certification	Analytical Method: TO-15									
Benzene	1	< 0.15	U	ug/m3	0.32	0.15	01/24/2020 01:11		662198	10AIR7
Ethylbenzene	1	< 0.30	U	ug/m3	0.88	0.30	01/24/2020 01:11		662198	10AIR7
Naphthalene	1	< 1.3	U	ug/m3	2.7	1.3	01/24/2020 01:11		662198	10AIR7
m&p-Xylene	1	< 0.70	U	ug/m3	1.8	0.70	01/24/2020 01:11		662198	10AIR7
o-Xylene	1	< 0.34	U	ug/m3	0.88	0.34	01/24/2020 01:11		662198	10AIR7

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Client: UPRR_Golder

Client ID: GS-1620-AA-1-20200219 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10509381013 **Moisture:** N/A **Pace Project** 10509381
Collected: 02/19/2020 09:50 **Received** 02/21/2020 10:00 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
TO15 MSV AIR	Analytical Method: TO-15									
Benzene	1.26	**0.73**		ug/m3	0.41	0.19	02/21/2020 23:08		661381	10AIRD
Ethylbenzene	1.26	< 0.38	U	ug/m3	1.1	0.38	02/21/2020 23:08		661381	10AIRD
Naphthalene	1.26	< 1.7	U	ug/m3	3.4	1.7	02/21/2020 23:08		661381	10AIRD
m&p-Xylene	1.26	< 0.88	U	ug/m3	2.2	0.88	02/21/2020 23:08		661381	10AIRD
o-Xylene	1.26	< 0.43	U	ug/m3	1.1	0.43	02/21/2020 23:08		661381	10AIRD

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Client: UPRR_Golder

Client ID: GS-1620-AA-1-20200219 CERT#008 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10509381014 **Moisture:** N/A **Pace Project** 10509381
Collected: 02/19/2020 09:50 **Received** 02/21/2020 10:00 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
Individual Can Certification	Analytical Method: TO-15									
Benzene	0.5	< 0.076	U	ug/m3	0.16	0.076	01/22/2020 09:47		662198	10AIRI
Ethylbenzene	0.5	< 0.15	U	ug/m3	0.44	0.15	01/22/2020 09:47		662198	10AIRI
Naphthalene	0.5	< 0.66	U	ug/m3	1.3	0.66	01/22/2020 09:47		662198	10AIRI
m&p-Xylene	0.5	< 0.35	U	ug/m3	0.88	0.35	01/22/2020 09:47		662198	10AIRI
o-Xylene	0.5	< 0.17	U	ug/m3	0.44	0.17	01/22/2020 09:47		662198	10AIRI

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Client: UPRR_Golder

Client ID: GS-1620-HE-1-20200219 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10509381015 **Moisture:** N/A **Pace Project** 10509381
Collected: 02/19/2020 11:10 **Received** 02/21/2020 10:00 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
TO15 MSV AIR	Analytical Method: TO-15									
Benzene	1	**5.6**		ug/m3	0.32	0.15	02/21/2020 23:36		661381	10AIRD
Ethylbenzene	1	**3.8**		ug/m3	0.88	0.30	02/21/2020 23:36		661381	10AIRD
Naphthalene	1	< 1.3	U	ug/m3	2.7	1.3	02/21/2020 23:36		661381	10AIRD
m&p-Xylene	1	**22.0**		ug/m3	1.8	0.70	02/21/2020 23:36		661381	10AIRD
o-Xylene	1	**21.2**		ug/m3	0.88	0.34	02/21/2020 23:36		661381	10AIRD

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Client: UPRR_Golder

Client ID: GS-1620-HE-1-20200219 CERT#251 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10509381016 **Moisture:** N/A **Pace Project** 10509381
Collected: 02/19/2020 11:10 **Received** 02/21/2020 10:00 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
Individual Can Certification	Analytical Method: TO-15									
Benzene	1	< 0.15	U	ug/m3	0.32	0.15	01/17/2020 22:45		662198	10AIR0
Ethylbenzene	1	< 0.30	U	ug/m3	0.88	0.30	01/17/2020 22:45		662198	10AIR0
Naphthalene	1	< 1.3	U	ug/m3	2.7	1.3	01/17/2020 22:45		662198	10AIR0
m&p-Xylene	1	< 0.70	U	ug/m3	1.8	0.70	01/17/2020 22:45		662198	10AIR0
o-Xylene	1	< 0.34	U	ug/m3	0.88	0.34	01/17/2020 22:45		662198	10AIR0

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Client: UPRR_Golder

Client ID: GS-1620-DUP-1-20200219 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10509381017 **Moisture:** N/A **Pace Project** 10509381
Collected: 02/19/2020 08:30 **Received** 02/21/2020 10:00 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
TO15 MSV AIR	Analytical Method: TO-15									
Benzene	1.68	< 0.26	U	ug/m3	0.55	0.26	02/22/2020 00:33		661381	10AIRD
Ethylbenzene	1.68	< 0.51	U	ug/m3	1.5	0.51	02/22/2020 00:33		661381	10AIRD
Naphthalene	1.68	< 2.2	U	ug/m3	4.5	2.2	02/22/2020 00:33		661381	10AIRD
m&p-Xylene	1.68	< 1.2	U	ug/m3	3.0	1.2	02/22/2020 00:33		661381	10AIRD
o-Xylene	1.68	< 0.58	U	ug/m3	1.5	0.58	02/22/2020 00:33		661381	10AIRD

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Client: UPRR_Golder

Client ID: GS-1620-DUP-1-20200219 CERT#24 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10509381018 **Moisture:** N/A **Pace Project** 10509381
Collected: 02/19/2020 08:30 **Received** 02/21/2020 10:00 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
Individual Can Certification	Analytical Method: TO-15									
Benzene	1	< 0.15	U	ug/m3	0.32	0.15	01/17/2020 18:56		662198	10AIR0
Ethylbenzene	1	< 0.30	U	ug/m3	0.88	0.30	01/17/2020 18:56		662198	10AIR0
Naphthalene	1	< 1.3	U	ug/m3	2.7	1.3	01/17/2020 18:56		662198	10AIR0
m&p-Xylene	1	< 0.70	U	ug/m3	1.8	0.70	01/17/2020 18:56		662198	10AIR0
o-Xylene	1	< 0.34	U	ug/m3	0.88	0.34	01/17/2020 18:56		662198	10AIR0

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Batch: 661381
Method: TO-15

Pace Project No.: 10509381
Instrument ID: 10AIRD

Blank: 3549644

Parameters	Dilutio	Quals	Result	Units	MQL	SDL	Analysis Date	Prep Date
Benzene	1	U	<0.15	ug/m3	0.32	0.15	02/21/2020 14:01	
Ethylbenzene	1	U	<0.30	ug/m3	0.88	0.30	02/21/2020 14:01	
Naphthalene	1	U	<1.3	ug/m3	2.7	1.3	02/21/2020 14:01	
m&p-Xylene	1	U	<0.70	ug/m3	1.8	0.70	02/21/2020 14:01	
o-Xylene	1	U	<0.34	ug/m3	0.88	0.34	02/21/2020 14:01	

Laboratory Control Sample: 3549645

Parameters	Spk Amt	LCS Result	Units	LCS %Rec	% Rec Limits	LCS Quals
Benzene	34.4	29.9	ug/m3	87	70-133	
Ethylbenzene	46.3	47.6	ug/m3	103	70-142	
Naphthalene	58.3	39.9	ug/m3	68	63-130	
m&p-Xylene	46	47.2	ug/m3	102	70-141	
o-Xylene	46.5	44.4	ug/m3	96	70-135	

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Pace Project 10509381

Analyte	Method	Unadjusted MQL	Reporting Units
Benzene	TO-15	0.33	ug/m3
Ethylbenzene	TO-15	0.88	ug/m3
Naphthalene	TO-15	2.7	ug/m3
m&p-Xylene	TO-15	1.8	ug/m3
o-Xylene	TO-15	0.88	ug/m3

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Pace Project 10509381

DEFINITIONS

DF	Dilution Factor
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting
U	Indicates the compound was analyzed for, but not detected.
SDL	Sample Detection Limit
MQL	Method Quantitation Limit
LCS(D)	Laboratory Control Sample (Duplicate)
MS(D)	Matrix Spike (Duplicate)
DUP	Sample Duplicate
RPD	Relative Percent Difference
TNI	The Nelac Institute

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

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Quality Control Data
Cross Reference Table

Pace Project 10509381

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Analytical
10509381001	**GS-1620-SG-8-20200219**	TO-15	661381	
10509381003	**GS-1620-SG-10-20200219**	TO-15	661381	
10509381005	**GS-1620-SG-11-20200219**	TO-15	661381	
10509381007	**GS-1620-SG-18-20200219**	TO-15	661381	
10509381009	**GS-1620-SG-21-20200219**	TO-15	661381	
10509381011	**GS-1620-SG-22-20200219**	TO-15	661381	
10509381013	**GS-1620-AA-1-20200219**	TO-15	661381	
10509381015	**GS-1620-HE-1-20200219**	TO-15	661381	
10509381017	**GS-1620-DUP-1-20200219**	TO-15	661381	
10509381002	**GS-1620-SG-8-20200219**	TO-15	662198	
10509381004	**GS-1620-SG-10-20200219**	TO-15	662198	
10509381006	**GS-1620-SG-11-20200219**	TO-15	662198	
10509381008	**GS-1620-SG-18-20200219**	TO-15	662198	
10509381010	**GS-1620-SG-21-20200219**	TO-15	662198	
10509381012	**GS-1620-SG-22-20200219**	TO-15	662198	
10509381014	**GS-1620-AA-1-20200219**	TO-15	662198	
10509381016	**GS-1620-HE-1-20200219**	TO-15	662198	
10509381018	**GS-1620-DUP-1-20200219**	TO-15	662198	

TRRP LABORATORY REVIEW CHECKLIST

Laboratory	Pace Analytical Services, Inc.	**LRC Date:**	03/13/2020
Project Name:	Houston TX-Wood: 1620-01-Rev1	**Laboratory Job**	10509381
Reviewer	Nathan Boberg	**Prep Batch Number**	See exception report.

#[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 SW846 Method 5035?			X		
		If required for the project, are 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		
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 check sample 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				
		Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package?	X				

TRRP LABORATORY REVIEW CHECKLIST			
Laboratory	Pace Analytical Services, Inc.	**LRC Date:**	03/13/2020
Project Name:	Houston TX-Wood: 1620-01-Rev1	**Laboratory Job**	10509381
Reviewer	Nathan Boberg	**Prep Batch Number**	See exception report.

1. Items identified by the letter "R" must be included in the laboratory in the laboratory data package submitted in the TRRP-required reports(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = Organic analyses; I = inorganic analysises (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

TRRP LABORATORY REVIEW CHECKLIST				
Laboratory	Pace Analytical Services, Inc.	**LRC Date:**	03/13/2020	
Project Name:	Houston TX-Wood: 1620-01-Rev1	**Laboratory Job**	10509381	
Reviewer	Nathan Boberg	**Prep Batch Number**	See exception report.	

#[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 precent 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 5.5.10)**					
		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 5?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	**OI**	**Verification/validation documentation for methods (NELAC Chapter 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				

1. Items identified by the letter "R" must be included in the laboratory in the laboratory data package submitted in the TRRP-required reports(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = Organic analyses; I = inorganic analysises (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

TRRP LABORATORY REVIEW CHECKLIST			
Laboratory	Pace Analytical Services, Inc.	**LRC Date:**	03/13/2020
Project Name:	Houston TX-Wood: 1620-01-Rev1	**Laboratory Job**	10509381
Reviewer	Nathan Boberg	**Prep Batch Number**	661381,662198

ER #[1]	Description

1. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Pace Analytical®
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WO# : 10509381

10509381

AIR: CHAIN-OF-CUSTODY / Analytical Request Document

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

43632

Page: 1 of 1

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Golder Associates	Report To:	Attention: Same as A
Address: 2201 Double Creek Dr. Suite 4004 RR, TX 78664	Copy To:	Company Name:
Email To: Michelle Hermisson	Purchase Order No.:	Address:
Phone: 512-671 3454 Fax:	Project Name:	Pace Quote Reference:
Requested Due Date/TAT:	Project Number:	Pace Project Manager/Sales Rep.
		Pace Profile #:

Program: ☐ UST ☐ Superfund ☐ Emissions ☐ Clean Air Act ☐ Voluntary Clean Up ☐ Dry Clean ☐ RCRA ☐ Other

Location of Sampling by State: _____

Reporting Units: ug/m³ X mg/m³ ___ PPBV X PPMV ___ Other ___

Report Level II.___ III.___ IV.___ Other___

'Section D Required Client Information

AIR SAMPLE ID

Sample IDs MUST BE UNIQUE

Valid Media Codes

MEDIA	CODE
Tedlar Bag	TB
1 Liter Summa Can	1LC
6 Liter Summa Can	6LC
Low Volume Puff	LVP
High Volume Puff	HVP
Other	PM10

ITEM #	'Section D Required Client Information AIR SAMPLE ID (Sample IDs MUST BE UNIQUE)	MEDIA CODE	PID Reading (Client only)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE - END/GRAB DATE	COMPOSITE - END/GRAB TIME	Canister Pressure (Initial Field - in Hg)	Canister Pressure (Final Field - in Hg)	Summa Can Number	Flow Control Number	Method: PM10	3C - Fixed Gas (%)	TO-3 BTEX	TO-3M (Methane)	TO-14	TO-15 Full List VOCs	TO-15 Short List BTEX	TO-15 Short List Chlorinated	TO-15 Short List (other)	Pace Lab ID
1	GS-1620-SG-8-20200219	1LC				2/19/20	1044	30	2	3285	—								X		
2	SG-10						1022	29	2	2912	—										
3	SG-11						1007	30	2	3030	—										
4	SG-18						0916	30	Ø	2567	—										
5	SG-21						0840	30	2	2009	—										
6	SG-22						0824	30	2	3179	—										
7	AA-1620-AA-1-20200219	6LC			0810		0950	30	4	0088	—										
8	AA-1620-HE-1-20200219	1LC					1110	30	Ø	2519	—					X					
9	GS-1620-Dup-1-20200219	↓					0830	30	2	2466	—									X	
10																					
11	Can 2452 has water in it from Sample port																				
12																					

Comments :

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Tim Nickels Golder	2/20/20	0940	Anthony Koch	2-20-20	0940
[signature]	2/20	0945	[signature] Pace	2/21/20	10:00

SAMPLE CONDITIONS

	Y/N	Y/N	Y/N
AMB	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
Temp in °C	Received on Ice	Custody Sealed Cooler	Samples Intact

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Tim Nickels

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM / DD / YY): 2/19/20

ORIGINAL

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414 Air Technical Phone: 612.607.6386

Pace Analytical®	Document Name: Air Sample Condition Upon Receipt	Document Revised: 19Nov2019 Page 1 of 1
	Document No.: F-MN-A-106-rev.20	Pace Analytical Services - Minneapolis

Air Sample Condition Upon Receipt **Client Name:** GOLDER-TX **Project #:** **WO#: 10509381**

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Pace ☐ SpeeDee ☐ Commercial **See Exception** ☐

Tracking Number: 493437371155, 493437371166

PM: NB3 **Due Date: 02/28/20**

CLIENT: UPRR_Golder

Custody Seal on Cooler/Box Present? ☒ Yes ☐ No **Seals Intact?** ☒ Yes ☐ No

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☒ Foam ☐ None ☐ Tin Can ☐ Other: _____ **Temp Blank rec:** ☐ Yes ☒ No

Temp. (TO17 and TO13 samples only) (°C): — **Corrected Temp (°C):** —

Thermometer Used: ☐ G87A9170600254 ☐ G87A9155100842

Temp should be above freezing to 6°C **Correction Factor:** —

Date & Initials of Person Examining Contents: 2/21/20 MI

Type of ice Received ☐ Blue ☐ Wet ☒ None

		Comments:
Chain of Custody Present?	☒ Yes ☐ No	1.
Chain of Custody Filled Out?	☒ Yes ☐ No	2.
Chain of Custody Relinquished?	☒ Yes ☐ No	3.
Sampler Name and/or Signature on COC?	☒ Yes ☐ No ☐ N/A	4.
Samples Arrived within Hold Time?	☒ Yes ☐ No	5.
Short Hold Time Analysis (<72 hr)?	☐ Yes ☒ No	6.
Rush Turn Around Time Requested?	☒ Yes ☐ No	7.
Sufficient Volume?	☒ Yes ☐ No	8.
Correct Containers Used? **(Tedlar bags not acceptable container for TO-14, TO-15 or APH)** -Pace Containers Used?	☒ Yes ☐ No ☒ Yes ☐ No	9.
Containers Intact? **(visual inspection/no leaks when pressurized)**	☒ Yes ☐ No	10.
Media: Air Can Airbag Filter TDT Passive		11. Individually Certified Cans (Y) N (list which samples)
Is sufficient information available to reconcile samples to the COC?	☒ Yes ☐ No	12. Sample SG-8 on COC has SG-9 on can tag
Do cans need to be pressurized? **(DO NOT PRESSURIZE 3C or ASTM 1946!!!)**	☒ Yes ☐ No	13.

Gauge # ☐ 10AIR26 ☒ 10AIR34 ☐ 10AIR35 ☐ 4097

Canisters					Canisters				
Sample Number	Can ID	Flow Controller	Initial Pressure	Final Pressure	Sample Number	Can ID	Flow Controller	Initial Pressure	Final Pressure
SG-8	3285	1655	-1	+10	DUP-1	2466	696	0	+10
SG-10	2912	2807	0	+10	Unused 3092	3092	2192	-23	—
SG-11	3030	1003	-1	+10	Unused 2452	2452	1668	—	—
SG-18	2567	2230	0	+10					
SG-21	2009	696	0	+10					
SG-22	3179	804	0	+10					
AA-1	88	2302	+10	—					
HE-1	2519	1818	0 +9 NP 2/21/20	+10					

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: Nathan Boberg **Date:** 2/21/20

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
1700 Elm St SE, Suite 200
Minneapolis, MN 55414
(612) 607-1700

March 13, 2020

Michelle Hermiston
Golder
2201 Double Creek Dr
Suite 4004
Round Rock, TX 78664

RE: Pace Project 10510405
Project ID: Houston TX-Wood: 1620-01-Rev1

Dear Michelle Hermiston:

Enclosed are the analytical results for sample(s) received by the laboratory on March 03, 2020. Results reported herin conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

This report was revised on March, 13, 2020 to create TRRP report.

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

Sincerely,

Nathan Boberg
nathan.boberg@pacelabs.com
(612)360-0728

Laboratory Certifications

Pace Analytical Minnesota : Texas Certification #: T104704192

REPORT OF LABORATORY ANALYSIS

03/13/2020 10:40:03

Sample Cross Reference

Pace Analytical Services, Inc.
1700 Elm St SE, Suite 200
Minneapolis, MN 55414
(612) 607-1700

Pace Project 10510405

Client: UPRR_Golder
Project ID: Houston TX-Wood: 1620-01-Rev1

Client Sample ID	Lab ID	Matrix	Collection Date/Time	Received Date/Time
GS-1620-SG20-20200227	10510405001	Air	02/27/2020 09:23	03/03/2020 09:45
GS-1620-SG19-20200227	10510405002	Air	02/27/2020 09:45	03/03/2020 09:45
GS-1620-SG17-20200227	10510405003	Air	02/27/2020 10:11	03/03/2020 09:45
GS-1620-SG16-20200227	10510405004	Air	02/27/2020 10:49	03/03/2020 09:45
GS-1620-SG15-20200227	10510405005	Air	02/27/2020 11:20	03/03/2020 09:45
GS-1620-SG14-20200227	10510405006	Air	02/27/2020 11:39	03/03/2020 09:45
GS-1620-SG12-20200227	10510405007	Air	02/27/2020 12:21	03/03/2020 09:45
AA-1620-AA-2-20200227	10510405008	Air	02/27/2020 09:49	03/03/2020 09:45
GS-1620-DUP-2-20200227	10510405009	Air	02/27/2020 10:49	03/03/2020 09:45
GS-1620-SG20-20200227Cert#1329	10510405012	Air	02/27/2020 09:23	03/03/2020 09:45
GS-1620-SG19-20200227Cert#2897	10510405013	Air	02/27/2020 09:45	03/03/2020 09:45
GS-1620-SG17-20200227Cert#2597	10510405014	Air	02/27/2020 10:11	03/03/2020 09:45
GS-1620-SG16-20200227Cert#2922	10510405015	Air	02/27/2020 10:49	03/03/2020 09:45
GS-1620-SG15-20200227Cert#2937	10510405016	Air	02/27/2020 11:20	03/03/2020 09:45
GS-1620-SG14-20200227Cert#3239	10510405017	Air	02/27/2020 11:39	03/03/2020 09:45
GS-1620-SG12-20200227Cert#3264	10510405018	Air	02/27/2020 12:27	03/03/2020 09:45
AA-1620-AA-2-20200227Cert#2829	10510405019	Air	02/27/2020 09:49	03/03/2020 09:45
GS-1620-DUP2-20200227Cert#0882	10510405020	Air	02/27/2020 10:49	03/03/2020 09:45

Pace Analytical Services, Inc.
1700 Elm St SE, Suite 200
Minneapolis, MN 55414
(612) 607-1700

Pace Project 10510405

Holding Times:

All holding times were met.

Blanks:

All blank results were below reporting limits.

Laboratory Control Samples:

All LCS recoveries were within QC limits.

Matrix Spikes and Duplicates:

All MS or MSD recoveries were within QC limits.

Surrogate:

All surrogate recoveries were within QC limits.

Appendix A
LABORATORY DATA PACKAGE COVER PAGE

This data package is for Job No. 10510405 and consists of:

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

[X] R1 - Field chain-of-custody documentation;

[X] R2 - Sample identification cross-reference;

[X] 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).

[X] R4 - Surrogate recovery data including:

a. Calculated recovery (%R), and

b. The laboratory's surrogate QC limits.

[X] R5 - Test reports/summary forms for blank samples;

[X] 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.

[X] R7 - Test reports/summary forms for 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, and

e. The laboratory's MS/MSD QC limits.

[X] 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 duplicated.

[X] R9 - List of method quantitation limits (MQLs) and detectability check sample results for each analyte and

[X] R10 - Other problems or anomalies.

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

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 Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [ ] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [X] MDH on 04/12/2011

Any findings affecting the data in this laboratory data package are noted in the Exception Reports herin. 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.

Name (Printed)	Signature	Official Title (Printed)	Date
Nathan Boberg		Project Manager	03/13/2020

Pace Analytical Services, Inc.
1700 Elm St SE, Suite 200
Minneapolis, MN 55414
(612) 607-1700

Client: UPRR_Golder

Client ID: GS-1620-SG20-20200227 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10510405001 **Moisture:** N/A **Pace Project** 10510405
Collected: 02/27/2020 09:23 **Received** 03/03/2020 09:45 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
TO15 MSV AIR	Analytical Method: TO-15									
Benzene	1.74	**0.27**	J	ug/m3	0.57	0.27	03/08/2020 20:49		663855	10AIRJ
Ethylbenzene	1.74	< 0.53	U	ug/m3	1.5	0.53	03/08/2020 20:49		663855	10AIRJ
Naphthalene	1.74	**3.1**	J	ug/m3	4.6	2.3	03/08/2020 20:49		663855	10AIRJ
m&p-Xylene	1.74	**1.7**	J	ug/m3	3.1	1.2	03/08/2020 20:49		663855	10AIRJ
o-Xylene	1.74	< 0.60	U	ug/m3	1.5	0.60	03/08/2020 20:49		663855	10AIRJ

Pace Analytical Services, Inc.
1700 Elm St SE, Suite 200
Minneapolis, MN 55414
(612) 607-1700

Client: UPRR_Golder

Client ID: GS-1620-SG19-20200227 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10510405002 **Moisture:** N/A **Pace Project** 10510405
Collected: 02/27/2020 09:45 **Received** 03/03/2020 09:45 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
TO15 MSV AIR	Analytical Method: TO-15									
Benzene	1.68	**0.46**	J	ug/m3	0.55	0.26	03/08/2020 20:14		663855	10AIRJ
Ethylbenzene	1.68	< 0.51	U	ug/m3	1.5	0.51	03/08/2020 20:14		663855	10AIRJ
Naphthalene	1.68	**3.5**	J	ug/m3	4.5	2.2	03/08/2020 20:14		663855	10AIRJ
m&p-Xylene	1.68	**1.6**	J	ug/m3	3.0	1.2	03/08/2020 20:14		663855	10AIRJ
o-Xylene	1.68	**0.91**	J	ug/m3	1.5	0.58	03/08/2020 20:14		663855	10AIRJ

Pace Analytical Services, Inc.
1700 Elm St SE, Suite 200
Minneapolis, MN 55414
(612) 607-1700

Client: UPRR_Golder

Client ID: GS-1620-SG17-20200227 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10510405003 **Moisture:** N/A **Pace Project** 10510405
Collected: 02/27/2020 10:11 **Received** 03/03/2020 09:45 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
TO15 MSV AIR	Analytical Method: TO-15									
Benzene	1.57	**0.25**	J	ug/m3	0.51	0.24	03/08/2020 19:39		663855	10AIRJ
Ethylbenzene	1.57	< 0.48	U	ug/m3	1.4	0.48	03/08/2020 19:39		663855	10AIRJ
Naphthalene	1.57	**3.0**	J	ug/m3	4.2	2.1	03/08/2020 19:39		663855	10AIRJ
m&p-Xylene	1.57	**1.1**	J	ug/m3	2.8	1.1	03/08/2020 19:39		663855	10AIRJ
o-Xylene	1.57	< 0.54	U	ug/m3	1.4	0.54	03/08/2020 19:39		663855	10AIRJ

Pace Analytical Services, Inc.
1700 Elm St SE, Suite 200
Minneapolis, MN 55414
(612) 607-1700

Client: UPRR_Golder

Client ID: GS-1620-SG16-20200227 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10510405004 **Moisture:** N/A **Pace Project** 10510405
Collected: 02/27/2020 10:49 **Received** 03/03/2020 09:45 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
TO15 MSV AIR	Analytical Method: TO-15									
Benzene	1.68	< 0.26	U	ug/m3	0.55	0.26	03/08/2020 19:03		663855	10AIRJ
Ethylbenzene	1.68	**13.4**		ug/m3	1.5	0.51	03/08/2020 19:03		663855	10AIRJ
Naphthalene	1.68	**3.1**	J	ug/m3	4.5	2.2	03/08/2020 19:03		663855	10AIRJ
m&p-Xylene	1.68	**46.9**		ug/m3	3.0	1.2	03/08/2020 19:03		663855	10AIRJ
o-Xylene	1.68	**20.9**		ug/m3	1.5	0.58	03/08/2020 19:03		663855	10AIRJ

Pace Analytical Services, Inc.
1700 Elm St SE, Suite 200
Minneapolis, MN 55414
(612) 607-1700

Client: UPRR_Golder

Client ID: GS-1620-SG15-20200227 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10510405005 **Moisture:** N/A **Pace Project** 10510405
Collected: 02/27/2020 11:20 **Received** 03/03/2020 09:45 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
TO15 MSV AIR	Analytical Method: TO-15									
Benzene	1.68	< 0.26	U	ug/m3	0.55	0.26	03/08/2020 18:28		663855	10AIRJ
Ethylbenzene	1.68	< 0.51	U	ug/m3	1.5	0.51	03/08/2020 18:28		663855	10AIRJ
Naphthalene	1.68	**3.4**	J	ug/m3	4.5	2.2	03/08/2020 18:28		663855	10AIRJ
m&p-Xylene	1.68	< 1.2	U	ug/m3	3.0	1.2	03/08/2020 18:28		663855	10AIRJ
o-Xylene	1.68	< 0.58	U	ug/m3	1.5	0.58	03/08/2020 18:28		663855	10AIRJ

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Client: UPRR_Golder

Client ID: GS-1620-SG14-20200227 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10510405006 **Moisture:** N/A **Pace Project** 10510405
Collected: 02/27/2020 11:39 **Received** 03/03/2020 09:45 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
TO15 MSV AIR	Analytical Method: TO-15									
Benzene	1.77	< 0.27	U	ug/m3	0.58	0.27	03/08/2020 17:53		663855	10AIRJ
Ethylbenzene	1.77	< 0.54	U	ug/m3	1.6	0.54	03/08/2020 17:53		663855	10AIRJ
Naphthalene	1.77	< 2.3	U	ug/m3	4.7	2.3	03/08/2020 17:53		663855	10AIRJ
m&p-Xylene	1.77	< 1.2	U	ug/m3	3.1	1.2	03/08/2020 17:53		663855	10AIRJ
o-Xylene	1.77	< 0.61	U	ug/m3	1.6	0.61	03/08/2020 17:53		663855	10AIRJ

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Client: UPRR_Golder

Client ID: GS-1620-SG12-20200227 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10510405007 **Moisture:** N/A **Pace Project** 10510405
Collected: 02/27/2020 12:21 **Received** 03/03/2020 09:45 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
TO15 MSV AIR	Analytical Method: TO-15									
Benzene	1.77	**0.28**	J	ug/m3	0.58	0.27	03/08/2020 17:18		663855	10AIRJ
Ethylbenzene	1.77	< 0.54	U	ug/m3	1.6	0.54	03/08/2020 17:18		663855	10AIRJ
Naphthalene	1.77	**3.1**	J	ug/m3	4.7	2.3	03/08/2020 17:18		663855	10AIRJ
m&p-Xylene	1.77	**1.3**	J	ug/m3	3.1	1.2	03/08/2020 17:18		663855	10AIRJ
o-Xylene	1.77	< 0.61	U	ug/m3	1.6	0.61	03/08/2020 17:18		663855	10AIRJ

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Client: UPRR_Golder

Client ID: AA-1620-AA-2-20200227 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10510405008 **Moisture:** N/A **Pace Project** 10510405
Collected: 02/27/2020 09:49 **Received** 03/03/2020 09:45 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
TO15 MSV AIR	Analytical Method: TO-15									
Benzene	1.22	**1.1**		ug/m3	0.40	0.19	03/08/2020 16:07		663855	10AIRJ
Ethylbenzene	1.22	< 0.37	U	ug/m3	1.1	0.37	03/08/2020 16:07		663855	10AIRJ
Naphthalene	1.22	< 1.6	U	ug/m3	3.2	1.6	03/08/2020 16:07		663855	10AIRJ
m&p-Xylene	1.22	**0.99**	J	ug/m3	2.2	0.85	03/08/2020 16:07		663855	10AIRJ
o-Xylene	1.22	< 0.42	U	ug/m3	1.1	0.42	03/08/2020 16:07		663855	10AIRJ

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Client: UPRR_Golder

Client ID: GS-1620-DUP-2-20200227 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10510405009 **Moisture:** N/A **Pace Project** 10510405
Collected: 02/27/2020 10:49 **Received** 03/03/2020 09:45 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
TO15 MSV AIR	Analytical Method: TO-15									
Benzene	1.71	**0.58**		ug/m3	0.56	0.26	03/08/2020 21:24		663855	10AIRJ
Ethylbenzene	1.71	**14.0**		ug/m3	1.5	0.52	03/08/2020 21:24		663855	10AIRJ
Naphthalene	1.71	**3.2**	J	ug/m3	4.5	2.2	03/08/2020 21:24		663855	10AIRJ
m&p-Xylene	1.71	**50.6**		ug/m3	3.0	1.2	03/08/2020 21:24		663855	10AIRJ
o-Xylene	1.71	**21.5**		ug/m3	1.5	0.59	03/08/2020 21:24		663855	10AIRJ

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Client: UPRR_Golder

Client ID: GS-1620-SG20-20200227Cert#1329 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10510405012 **Moisture:** N/A **Pace Project** 10510405
Collected: 02/27/2020 09:23 **Received** 03/03/2020 09:45 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
Individual Can Certification	Analytical Method: TO-15									
Benzene	1	**0.21**	J	ug/m3	0.32	0.15	01/24/2020 01:41		663943	10AIR7
Ethylbenzene	1	< 0.30	U	ug/m3	0.88	0.30	01/24/2020 01:41		663943	10AIR7
Naphthalene	1	< 1.3	U	ug/m3	2.7	1.3	01/24/2020 01:41		663943	10AIR7
m&p-Xylene	1	< 0.70	U	ug/m3	1.8	0.70	01/24/2020 01:41		663943	10AIR7
o-Xylene	1	< 0.34	U	ug/m3	0.88	0.34	01/24/2020 01:41		663943	10AIR7

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Client: UPRR_Golder

Client ID: GS-1620-SG19-20200227Cert#2897 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10510405013 **Moisture:** N/A **Pace Project** 10510405
Collected: 02/27/2020 09:45 **Received** 03/03/2020 09:45 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
Individual Can Certification	Analytical Method: TO-15									
Benzene	1	< 0.15	U	ug/m3	0.32	0.15	01/23/2020 11:08		663943	10AIRD
Ethylbenzene	1	< 0.30	U	ug/m3	0.88	0.30	01/23/2020 11:08		663943	10AIRD
Naphthalene	1	< 1.3	U	ug/m3	2.7	1.3	01/23/2020 11:08		663943	10AIRD
m&p-Xylene	1	< 0.70	U	ug/m3	1.8	0.70	01/23/2020 11:08		663943	10AIRD
o-Xylene	1	< 0.34	U	ug/m3	0.88	0.34	01/23/2020 11:08		663943	10AIRD

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Client: UPRR_Golder

Client ID: GS-1620-SG17-20200227Cert#2597 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10510405014 **Moisture:** N/A **Pace Project** 10510405
Collected: 02/27/2020 10:11 **Received** 03/03/2020 09:45 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
Individual Can Certification	Analytical Method: TO-15									
Benzene	1	< 0.15	U	ug/m3	0.32	0.15	01/18/2020 01:38		663943	10AIR0
Ethylbenzene	1	< 0.30	U	ug/m3	0.88	0.30	01/18/2020 01:38		663943	10AIR0
Naphthalene	1	< 1.3	U	ug/m3	2.7	1.3	01/18/2020 01:38		663943	10AIR0
m&p-Xylene	1	< 0.70	U	ug/m3	1.8	0.70	01/18/2020 01:38		663943	10AIR0
o-Xylene	1	< 0.34	U	ug/m3	0.88	0.34	01/18/2020 01:38		663943	10AIR0

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Client: UPRR_Golder

Client ID: GS-1620-SG16-20200227Cert#2922 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10510405015 **Moisture:** N/A **Pace Project** 10510405
Collected: 02/27/2020 10:49 **Received** 03/03/2020 09:45 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
Individual Can Certification	Analytical Method: TO-15									
Benzene	1	< 0.15	U	ug/m3	0.32	0.15	01/15/2020 22:50		663943	10AIRI
Ethylbenzene	1	< 0.30	U	ug/m3	0.88	0.30	01/15/2020 22:50		663943	10AIRI
Naphthalene	1	< 1.3	U	ug/m3	2.7	1.3	01/15/2020 22:50		663943	10AIRI
m&p-Xylene	1	< 0.70	U	ug/m3	1.8	0.70	01/15/2020 22:50		663943	10AIRI
o-Xylene	1	< 0.34	U	ug/m3	0.88	0.34	01/15/2020 22:50		663943	10AIRI

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Client: UPRR_Golder

Client ID: GS-1620-SG15-20200227Cert#2937 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10510405016 **Moisture:** N/A **Pace Project** 10510405
Collected: 02/27/2020 11:20 **Received** 03/03/2020 09:45 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
Individual Can Certification	Analytical Method: TO-15									
Benzene	1	< 0.15	U	ug/m3	0.32	0.15	01/24/2020 00:12		663943	10AIR7
Ethylbenzene	1	< 0.30	U	ug/m3	0.88	0.30	01/24/2020 00:12		663943	10AIR7
Naphthalene	1	< 1.3	U	ug/m3	2.7	1.3	01/24/2020 00:12		663943	10AIR7
m&p-Xylene	1	< 0.70	U	ug/m3	1.8	0.70	01/24/2020 00:12		663943	10AIR7
o-Xylene	1	< 0.34	U	ug/m3	0.88	0.34	01/24/2020 00:12		663943	10AIR7

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Client: UPRR_Golder

Client ID: GS-1620-SG14-20200227Cert#3239 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10510405017 **Moisture:** N/A **Pace Project** 10510405
Collected: 02/27/2020 11:39 **Received** 03/03/2020 09:45 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
Individual Can Certification	Analytical Method: TO-15									
Benzene	1	< 0.15	U	ug/m3	0.32	0.15	01/25/2020 03:58		663943	10AIR7
Ethylbenzene	1	< 0.30	U	ug/m3	0.88	0.30	01/25/2020 03:58		663943	10AIR7
Naphthalene	1	< 1.3	U	ug/m3	2.7	1.3	01/25/2020 03:58		663943	10AIR7
m&p-Xylene	1	< 0.70	U	ug/m3	1.8	0.70	01/25/2020 03:58		663943	10AIR7
o-Xylene	1	< 0.34	U	ug/m3	0.88	0.34	01/25/2020 03:58		663943	10AIR7

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Client: UPRR_Golder

Client ID: GS-1620-SG12-20200227Cert#3264 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10510405018 **Moisture:** N/A **Pace Project** 10510405
Collected: 02/27/2020 12:27 **Received** 03/03/2020 09:45 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
Individual Can Certification	Analytical Method: TO-15									
Benzene	1	< 0.15	U	ug/m3	0.32	0.15	01/15/2020 12:24		663943	10AIR7
Ethylbenzene	1	< 0.30	U	ug/m3	0.88	0.30	01/15/2020 12:24		663943	10AIR7
Naphthalene	1	< 1.3	U	ug/m3	2.7	1.3	01/15/2020 12:24		663943	10AIR7
m&p-Xylene	1	< 0.70	U	ug/m3	1.8	0.70	01/15/2020 12:24		663943	10AIR7
o-Xylene	1	< 0.34	U	ug/m3	0.88	0.34	01/15/2020 12:24		663943	10AIR7

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Client: UPRR_Golder

Client ID: AA-1620-AA-2-20200227Cert#2829 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10510405019 **Moisture:** N/A **Pace Project** 10510405
Collected: 02/27/2020 09:49 **Received** 03/03/2020 09:45 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
Individual Can Certification	Analytical Method: TO-15									
Benzene	0.5	< 0.076	U	ug/m3	0.16	0.076	01/16/2020 04:45		663943	10AIRI
Ethylbenzene	0.5	< 0.15	U	ug/m3	0.44	0.15	01/16/2020 04:45		663943	10AIRI
Naphthalene	0.5	< 0.66	U	ug/m3	1.3	0.66	01/16/2020 04:45		663943	10AIRI
m&p-Xylene	0.5	< 0.35	U	ug/m3	0.88	0.35	01/16/2020 04:45		663943	10AIRI
o-Xylene	0.5	< 0.17	U	ug/m3	0.44	0.17	01/16/2020 04:45		663943	10AIRI

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Client: UPRR_Golder

Client ID: GS-1620-DUP2-20200227Cert#0882 **Project ID:** Houston TX-Wood: 1620-01-
Lab ID: 10510405020 **Moisture:** N/A **Pace Project** 10510405
Collected: 02/27/2020 10:49 **Received** 03/03/2020 09:45 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
Individual Can Certification	Analytical Method: TO-15									
Benzene	1	< 0.15	U	ug/m3	0.32	0.15	01/18/2020 12:34		663943	10AIRI
Ethylbenzene	1	< 0.30	U	ug/m3	0.88	0.30	01/18/2020 12:34		663943	10AIRI
Naphthalene	1	< 1.3	U	ug/m3	2.7	1.3	01/18/2020 12:34		663943	10AIRI
m&p-Xylene	1	< 0.70	U	ug/m3	1.8	0.70	01/18/2020 12:34		663943	10AIRI
o-Xylene	1	< 0.34	U	ug/m3	0.88	0.34	01/18/2020 12:34		663943	10AIRI

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Batch: 663855
Method: TO-15

Pace Project No.: 10510405
Instrument ID: 10AIRJ

Blank: 3561585

Parameters	Dilutio	Quals	Result	Units	MQL	SDL	Analysis Date	Prep Date
Benzene	1	U	<0.15	ug/m3	0.32	0.15	03/08/2020 09:37	
Ethylbenzene	1	U	<0.30	ug/m3	0.88	0.30	03/08/2020 09:37	
Naphthalene	1	J	1.7	ug/m3	2.7	1.3	03/08/2020 09:37	
m&p-Xylene	1	U	<0.70	ug/m3	1.8	0.70	03/08/2020 09:37	
o-Xylene	1	U	<0.34	ug/m3	0.88	0.34	03/08/2020 09:37	

Laboratory Control Sample: 3561586

Parameters	Spk Amt	LCS Result	Units	LCS %Rec	% Rec Limits	LCS Quals
Benzene	33.5	33.2	ug/m3	99	70-133	
Ethylbenzene	45.6	50.5	ug/m3	111	70-142	
Naphthalene	57.7	62.8	ug/m3	109	63-130	
m&p-Xylene	91.2	108	ug/m3	119	70-141	
o-Xylene	45.5	51.2	ug/m3	113	70-135	

Duplicate: 3561843

Original for Sample: Project sample AA-1620-AA-2-20200227

Parameters	Original Result	Dup Result	Units	RPD	Max RPD	Quals
Benzene	1.1	1.1	ug/m3	1	25	
Ethylbenzene	<0.37	<0.37	ug/m3		25	
Naphthalene	<1.6	<1.6	ug/m3		25	
m&p-Xylene	0.99J	0.97	ug/m3		25	
o-Xylene	<0.42	<0.42	ug/m3		25	

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Pace Project 10510405

Analyte	Method	Unadjusted MQL	Reporting Units
Benzene	TO-15	0.33	ug/m3
Ethylbenzene	TO-15	0.88	ug/m3
Naphthalene	TO-15	2.7	ug/m3
m&p-Xylene	TO-15	1.8	ug/m3
o-Xylene	TO-15	0.88	ug/m3

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Pace Project 10510405

DEFINITIONS

DF	Dilution Factor
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting
U	Indicates the compound was analyzed for, but not detected.
SDL	Sample Detection Limit
MQL	Method Quantitation Limit
LCS(D)	Laboratory Control Sample (Duplicate)
MS(D)	Matrix Spike (Duplicate)
DUP	Sample Duplicate
RPD	Relative Percent Difference
TNI	The Nelac Institute

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

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Quality Control Data
Cross Reference Table

Pace Project 10510405

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Analytical
10510405001	**GS-1620-SG20-20200227**	TO-15	663855	
10510405002	**GS-1620-SG19-20200227**	TO-15	663855	
10510405003	**GS-1620-SG17-20200227**	TO-15	663855	
10510405004	**GS-1620-SG16-20200227**	TO-15	663855	
10510405005	**GS-1620-SG15-20200227**	TO-15	663855	
10510405006	**GS-1620-SG14-20200227**	TO-15	663855	
10510405007	**GS-1620-SG12-20200227**	TO-15	663855	
10510405008	**AA-1620-AA-2-20200227**	TO-15	663855	
10510405009	**GS-1620-DUP-2-20200227**	TO-15	663855	
10510405012	**GS-1620-SG20-**	TO-15	663943	
10510405013	**GS-1620-SG19-**	TO-15	663943	
10510405014	**GS-1620-SG17-**	TO-15	663943	
10510405015	**GS-1620-SG16-**	TO-15	663943	
10510405016	**GS-1620-SG15-**	TO-15	663943	
10510405017	**GS-1620-SG14-**	TO-15	663943	
10510405018	**GS-1620-SG12-**	TO-15	663943	
10510405019	**AA-1620-AA-2-**	TO-15	663943	
10510405020	**GS-1620-DUP2-**	TO-15	663943	

TRRP LABORATORY REVIEW CHECKLIST								
Laboratory	Pace Analytical Services, Inc.		**LRC Date:**	03/13/2020				
Project Name:	Houston TX-Wood: 1620-01-Rev1		**Laboratory Job**	10510405				
Reviewer	Nathan Boberg		**Prep Batch Number**	See exception report.				
#[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 SW846 Method 5035?				X		
		If required for the project, are 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		
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 check sample 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				
		Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?		X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package?		X				

TRRP LABORATORY REVIEW CHECKLIST			
Laboratory	Pace Analytical Services, Inc.	**LRC Date:**	03/13/2020
Project Name:	Houston TX-Wood: 1620-01-Rev1	**Laboratory Job**	10510405
Reviewer	Nathan Boberg	**Prep Batch Number**	See exception report.

1. Items identified by the letter "R" must be included in the laboratory in the laboratory data package submitted in the TRRP-required reports(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = Organic analyses; I = inorganic analysises (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

TRRP LABORATORY REVIEW CHECKLIST				
Laboratory	Pace Analytical Services, Inc.	**LRC Date:**	03/13/2020	
Project Name:	Houston TX-Wood: 1620-01-Rev1	**Laboratory Job**	10510405	
Reviewer	Nathan Boberg	**Prep Batch Number**	See exception report.	

#[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 precent 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 5.5.10)**					
		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 5?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	**OI**	**Verification/validation documentation for methods (NELAC Chapter 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				

1. Items identified by the letter "R" must be included in the laboratory in the laboratory data package submitted in the TRRP-required reports(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = Organic analyses; I = inorganic analysises (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

TRRP LABORATORY REVIEW CHECKLIST			
Laboratory	Pace Analytical Services, Inc.	**LRC Date:**	03/13/2020
Project Name:	Houston TX-Wood: 1620-01-Rev1	**Laboratory Job**	10510405
Reviewer	Nathan Boberg	**Prep Batch Number**	663855,663943

ER #[1]	Description

1. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

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www.pacelabs.com

AIR: CHAIN-OF-CUSTODY

The Chain-of-Custody is a LEGAL DOCUMENT. All relev

WO# : 10510405

10510405

43633

Page: 1 of 1

Section A Required Client Information:

Company: Golder Associate Inc.
Address: 2201 Double Creek Dr.
Suite 4004 Round Rock Tx 78664
Email To: Eric_Matzner@Golder.com
Phone: 512 671 3454 Fax:
Requested Due Date/TAT: 5 days

Section B Required Project Information:

Report To: Anthon_Reid@Golder.com
Copy To:
Purchase Order No.:
Project Name: Houston Tx - Wood Processing Work KS
Project Number: 1620-01-Rev 0

Section C Invoice Information:

Attention: UPRR/Keith Peterbors
Company Name: Union Pacific Railroad-AP
Address: 1400 Douglas street Stop 0750 Omaha NE 68179-0750
Pace Quote Reference:
Pace Project Manager/Sales Rep.
Pace Profile #:

Program: ☐ UST ☐ Superfund ☐ Emissions ☐ Clean Air Act ☐ Voluntary Clean Up ☐ Dry Clean ☐ RCRA ☐ Other

Location of Sampling by State: Tx

Reporting Units: ug/m³ mg/m³ PPBV PPMV Other

Report Level: II. III. IV. Other

Section D Required Client Information

AIR SAMPLE ID
Sample IDs MUST BE UNIQUE

Valid Media Codes

MEDIA	CODE
Tedlar Bag	TB
1 Liter Summa Can	1LC
6 Liter Summa Can	6LC
Low Volume Puff	LVP
High Volume Puff	HVP
Other	PM10

92688 COLLECTED

ITEM #	'Section D Required Client Information AIR SAMPLE ID	MEDIA CODE	PID Reading (Client only)	COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE - END/GRAB DATE	COMPOSITE - END/GRAB TIME	Canister Pressure (Initial Field - in Hg)	Canister Pressure (Final Field - in Hg)	Summa Can Number	Flow Control Number	Method: PM10	3C - Fixed Gas (%)	TO-3 BTEX	TO-3M (Methane)	TO-14	TO-15 Full List VOCs	TO-15 Short List BTEX	TO-15 Short List Chlorinated	TO-15 Short List (other)	Pace Lab ID
1	GS-1620-SG20-20200227			2-27-20	0916	2-27-20	0923	28	1	1329								X			001 012
2	SG19				0938		0945	30	1	2897											002 013
3	SG17				1003		1011	30	2	2597											003 014
4	SG16				1036		1049	29	1	2922											004 015
5	SG15				1114		1120	30	2	2937											005 016
6	SG14				1133		1139	30	2	3239											006 017
7	SG12				1221		1227	30	2	3264											007 018
8	AA-1620-AA-2-20200227				0900		0949	29.5	0	2829											008 019
9	GS-1620-Dup-2-20200227				1036		1049	29	1	0882											009 020
10																					
11																					
12																					

Comments :

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Tedlar	2-28-20	1030	Pace	3/3/20	0945

SAMPLE CONDITIONS

-	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
Temp In °C	Received on Ice	Custody Sealed Cooler	Samples Intact

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Anthony Reid

SIGNATURE of SAMPLER: DATE Signed (MM / DD / YY): 02/28/20

ORIGINAL

Pace Analytical®	Document Name: Air Sample Condition Upon Receipt	Document Revised: 19Nov2019 Page 1 of 1
	Document No.: F-MN-A-106-rev.20	Pace Analytical Services - Minneapolis

Air Sample Condition Upon Receipt

Client Name: Golder Assoc.

Project #: **WO#: 10510405**

PM: NB3 **Due Date: 03/10/20**

CLIENT: UPRR_Golder

Courier: ☒Fed Ex ☐UPS ☐USPS ☐Client ☐Pace ☐SpeeDee ☐Commercial See Exception ☐

Tracking Number: 1083 0284 3954/3948

Custody Seal on Cooler/Box Present? ☒Yes ☐No **Seals Intact?** ☒Yes ☐No

Packing Material: ☒Bubble Wrap ☐Bubble Bags ☒Foam ☐None ☐Tin Can ☐Other:_____ **Temp Blank rec:** ☐Yes ☐No

Temp. (TO17 and TO13 samples only) (°C): ~ **Corrected Temp (°C):** ~ **Thermometer Used:** ☐G87A9170600254 ☐G87A9155100842

Temp should be above freezing to 6°C **Correction Factor:** ~ **Date & Initials of Person Examining Contents:** _____

Type of ice Received ☐Blue ☐Wet ☒None

		Comments:
Chain of Custody Present?	☐Yes ☐No	1.
Chain of Custody Filled Out?	☐Yes ☐No	2.
Chain of Custody Relinquished?	☐Yes ☐No	3.
Sampler Name and/or Signature on COC?	☐Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time?	☐Yes ☐No	5.
Short Hold Time Analysis (<72 hr)?	☐Yes ☐No	6.
Rush Turn Around Time Requested?	☐Yes ☐No	7.
Sufficient Volume?	☐Yes ☐No	8.
Correct Containers Used? **(Tedlar bags not acceptable container for TO-14, TO-15 or APH)** -Pace Containers Used?	☐Yes ☐No ☐Yes ☐No	9.
Containers Intact? **(visual inspection/no leaks when pressurized)**	☐Yes ☐No	10.
Media: Air Can Airbag Filter TDT Passive		11. Individually Certified Cans Y N (list which samples)
Is sufficient information available to reconcile samples to the COC?	☐Yes ☐No	12.
Do cans need to be pressurized? **(DO NOT PRESSURIZE 3C or ASTM 1946!!!)**	☐Yes ☐No	13.

Gauge # ☐10AIR26 ☐10AIR34 ☐10AIR35 ☐4097

Canisters					Canisters				
Sample Number	Can ID	Flow Controller	Initial Pressure	Final Pressure	Sample Number	Can ID	Flow Controller	Initial Pressure	Final Pressure
SG-20	1329	2833	-1	10	Dup-2	0882	0793	-0.5	10
SG 19	2897	2304	0	16	Unused	2492	1630	-27	-
SG 17	2597	2441	1	10	Unused	2906	1762	-27.5	-
SG 16	2922	0793	0	10					
SG 15	2937	1982	0	16					
SG 14	3239	2368	-1.5	10					
SG 12	3264	1508	-1.5	10					
AA-2	2829	1503	1.5	10					

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: Nathan Boberg **Date:** 3/4/20

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Memorandum

July 27, 2020

To:	Eric Matzner	Ref. No.:	11183954-1620
From:	Chris G. Knight/eew/694-NF	Tel:	512-506-8803
cc:	Jesse Orth, Jon Lang; Julie Lidstone		

Subject: **Data Usability Summary**
Soil Gas Sampling Event
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works
Houston, Texas
June 2020

1. Scope of Data Usability Study

This document details a Data Usability Summary (DUS) of analytical results for soil gas samples collected in support of the Soil Gas Sampling Event at the Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works site during June 2020. Samples were submitted to Pace Analytical Services, Inc., located in Minneapolis, Minnesota and are reported in data package 10523718. The intended use of the data is to support the Soil Gas Sampling 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 laboratory control samples (LCS)/ duplicate analyses (DUP), field quality assurance/quality control samples (QA/QC), 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 # TX104704192 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 duplicate sample sets 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 duplicate analyses.

4. Data Review/Validation Results

4.1 Sample Holding Time

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

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

All sample canisters were received at the laboratory in good condition and within acceptable canister pressure range of –1 inch of mercury (Hg) to –10 inches of Hg, indicating samples were still under vacuum upon receipt.

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 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.

4.6 Duplicate Sample Analyses

Analytical precision is evaluated based on the analysis of laboratory duplicate samples. The relative percent differences (RPD) established by the laboratory are adopted as the acceptance criteria for the project.

The laboratory performed a duplicate analysis on a non-site sample. This cannot be used to assess precision for the site samples.

4.7 Field QA/QC Samples

The field QA/QC consisted of one field duplicate sample set.

To assess the analytical and sampling protocol precision, one field duplicate sample set was collected and submitted "blind" to the laboratory, as specified in Table 1. The RPDs associated with these duplicate samples must be less than fifty percent for soil 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 4):

i) GS-1620-SG27-20200630 and GS-1620-Dup-3-20200630 did show variability in the following compounds: benzene, ethylbenzene, m&p-xylenes, and o-xylene. All associated sample results were qualified as estimated.

4.8 Field Procedures

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

4.9 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 Soil Gas Sampling Event at the site by providing current concentration of chemicals of concern in soil gas samples with the specific qualifications noted herein.

Table 1

Sample Collection and Analysis Summary
Soil Gas Sampling Event
Union Pacific Railroad (UPRR)/Houston, TX-Wood Preserving Works
Houston, Texas
June 2020

					Analysis/Parameters	
Sample Identification	**Location**	**Matrix**	**Collection Date (mm/dd/yyyy)**	**Collection Time (hr:min)**	**VOCs**	**Comments**
GS-1620-SG25-20200630	SG-25	Soil Gas	06/30/2020	10:52	X	
GS-1620-SG25-20200630 CERT 306	SG-25	Soil Gas	06/30/2020	10:52	X	
AA-1620-AA-3-20200630	AA-3	Soil Gas	06/30/2020	11:07	X	
AA-1620-AA-3-20200630 CERT 351	AA-3	Soil Gas	06/30/2020	11:07	X	
GS-1620-SG27-20200630	SG-27	Soil Gas	06/30/2020	11:50	X	
GS-1620-SG27-20200630 CERT 362	SG-27	Soil Gas	06/30/2020	11:50	X	
GS-1620-Dup-3-20200630	SG-27	Soil Gas	06/30/2020	11:50	X	Field duplicate of GS-1620-SG27-20200630
GS-1620-Dup-3-20200630 CERT 28	SG-27	Soil Gas	06/30/2020	11:50	X	

Notes:

VOCs - Volatile Organic Compounds

Table 2

Analytical Results Summary
Soil Gas Sampling Event
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works
Houston, Texas
June 2020

Location ID:		**AA-3**	**AA-3**	**SG-25**	**SG-25**
Sample Name:		**AA-1620-AA-3-20200630**	**AA-1620-AA-3-20200630 CERT 351**	**GS-1620-SG25-20200630**	**GS-1620-SG25-20200630 CERT 306**
Sample Date:		**06/30/2020**	**06/30/2020**	**06/30/2020**	**06/30/2020**
Parameters	**Unit**				
Volatile Organic Compounds					
Benzene	µg/m3	<0.18	<0.065	<0.25	<0.13
Ethylbenzene	µg/m3	<0.23	<0.069	<0.32	<0.14
m&p-Xylenes	µg/m3	<0.53	<0.17	<0.74	<0.34
Naphthalene	µg/m3	<1.7	<0.64	<2.4	<1.3
o-Xylene	µg/m3	<0.24	<0.074	<0.34	<0.15

Table 2

Analytical Results Summary
Soil Gas Sampling Event
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works
Houston, Texas
June 2020

Location ID:		**SG-27**	**SG-27**	**SG-27**	**SG-27**
Sample Name:		**GS-1620-SG27-20200630**	**GS-1620-SG27-20200630 CERT 362**	**GS-1620-Dup-3-20200630**	**GS-1620-Dup-3-20200630 CERT 28**
Sample Date:		**06/30/2020**	**06/30/2020**	**06/30/2020**	**06/30/2020**
				Duplicate	
Parameters	**Unit**				
Volatile Organic Compounds					
Benzene	µg/m3	12.4 J	0.18 J	1.5 J	<0.13
Ethylbenzene	µg/m3	7.9 J	<0.14	2.2 J	<0.14
m&p-Xylenes	µg/m3	21.2 J	<0.34	7.7 J	<0.34
Naphthalene	µg/m3	<2.3	<1.3	<2.3	<1.3
o-Xylene	µg/m3	6.2 J	<0.15	3.1 J	<0.15

Notes:

< - Not detected at the associated reporting

J - Estimated concentration

Table 3

Analytical Methods
Soil Gas Sampling Event
Union Pacific Railroad (UPRR)/Houston, TX-Wood Preserving Works
Houston, Texas
June 2020

Parameter	Method	Matrix	Holding Time Collection to Analysis (Days)
VOCs	TO-15 (1)	Soil Gas	30

Notes:

VOCs - Volatile Organic Compounds

Method References:

(1) - Referenced from "Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air", January 1999

Table 4

Qualified Sample Data Due to Variability in Field Duplicate Results
Soil Gas Sampling Event
Union Pacific Railroad (UPRR)/Houston, TX-Wood Preserving Works
Houston, Texas
June 2020

Parameter	Analyte	RPD	Sample ID	Qualified Result	Field Duplicate Sample ID	Qualified Result	Units
VOCs	Benzene	156	GS-1620-SG27-20200630	12.4 J	GS-1620-Dup-3-20200630	1.5 J	µg/m3
	Ethylbenzene	112		7.9 J		2.2 J	µg/m3
	m&p-Xylenes	93.4		21.2 J		7.7 J	µg/m3
	o-Xylene	66.7		6.2 J		3.1 J	µg/m3

Notes:

RPD - Relative Percent Difference
VOCs - Volatile Organic Compounds
J - Estimated concentration

Attachment A
Laboratory NELAP Certificate

Texas Commission on Environmental Quality

NELAP-Recognized Laboratory Accreditation is hereby awarded to

Pace Analytical Services, LLC - Minneapolis MN

1700 Elm Street SE Suite 200
Minneapolis, MN 55414-2485

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: T104704192-20-15
Effective Date: 3/1/2020
Expiration Date: 2/28/2021

Executive Director Texas Commission on Environmental Quality

Pace Analytical Services, LLC
1700 Elm St SE, Suite 200
Minneapolis, MN 55414
(612) 607-1700

July 10, 2020

Michelle Hermiston
Golder
2201 Double Creek Dr
Suite 4004
Round Rock, TX 78664

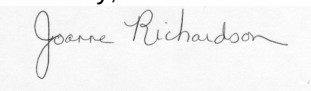
RE: Pace Project 10523718
Project ID: 19119232.440 HWPW

Dear Michelle Hermiston:

Enclosed are the analytical results for sample(s) received by the laboratory on July 03, 2020. Results reported herin conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,



Joanne Richardson
joanne.richardson@pacelabs.com
1(612)607-6453

Laboratory Certifications

Pace Analytical Minnesota : Texas Certification #: T104704192

REPORT OF LABORATORY ANALYSIS

Sample Cross Reference

Pace Analytical Services, LLC
1700 Elm St SE, Suite 200
Minneapolis, MN 55414
(612) 607-1700

Pace Project 10523718

Client: UPRR_Golder
Project ID: 19119232.440 HWPW

Client Sample ID	Lab ID	Matrix	Collection Date/Time	Received Date/Time
AA-1620-AA-3-20200630	10523718001	Air	06/30/2020 11:07	07/03/2020 09:30
AA-1620-AA-3-20200630 CERT 351	10523718002	Air	06/30/2020 11:07	07/03/2020 09:30
GS-1620-SG25-20200630	10523718003	Air	06/30/2020 10:52	07/03/2020 09:30
GS-1620-SG25-20200630 CERT 306	10523718004	Air	06/30/2020 10:52	07/03/2020 09:30
GS-1620-SG27-20200630	10523718005	Air	06/30/2020 11:50	07/03/2020 09:30
GS-1620-SG27-20200630 CERT 362	10523718006	Air	06/30/2020 11:50	07/03/2020 09:30
GS-1620-Dup-3-20200630	10523718007	Air	06/30/2020 11:50	07/03/2020 09:30
GS-1620-Dup-3-20200630 CERT 28	10523718008	Air	06/30/2020 11:50	07/03/2020 09:30

Pace Analytical Services, LLC
1700 Elm St SE, Suite 200
Minneapolis, MN 55414
(612) 607-1700

Pace Project 10523718

Holding Times:

All holding times were met.

Blanks:

All blank results were below reporting limits.

Laboratory Control Samples:

All LCS recoveries were within QC limits.

Matrix Spikes and Duplicates:

All MS or MSD recoveries were within QC limits.

Surrogate:

All surrogate recoveries were within QC limits.

Appendix A
LABORATORY DATA PACKAGE COVER PAGE

This data package is for Job No. 10523718 and consists of:

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

[X] R1 - Field chain-of-custody documentation;

[X] R2 - Sample identification cross-reference;

[X] 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).

[X] R4 - Surrogate recovery data including:

a. Calculated recovery (%R), and

b. The laboratory's surrogate QC limits.

[X] R5 - Test reports/summary forms for blank samples;

[X] 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.

[X] R7 - Test reports/summary forms for 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, and

e. The laboratory's MS/MSD QC limits.

[X] 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 duplicated.

[X] R9 - List of method quantitation limits (MQLs) and detectability check sample results for each analyte and

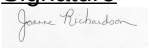
[X] R10 - Other problems or anomalies.

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

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 Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [ ] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by [X] MDH on 04/12/2011

Any findings affecting the data in this laboratory data package are noted in the Exception Reports herin. 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.

Name (Printed)	Signature	Official Title (Printed)	Date
Joanne Richardson		Project Manager	07/10/2020

Pace Analytical Services, LLC
1700 Elm St SE, Suite 200
Minneapolis, MN 55414
(612) 607-1700

Client: UPRR_Golder

Client ID: AA-1620-AA-3-20200630 **Project ID:** 19119232.440 HWPW
Lab ID: 10523718001 **Moisture:** N/A **Pace Project** 10523718
Collected: 06/30/2020 11:07 **Received** 07/03/2020 09:30 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
TO15 MSV AIR	Analytical Method: TO-15									
Benzene	1.39	< 0.18	U	ug/m3	0.45	0.18	07/09/2020 19:59		685781	10AIRJ
Ethylbenzene	1.39	< 0.23	U	ug/m3	1.2	0.23	07/09/2020 19:59		685781	10AIRJ
Naphthalene	1.39	< 1.7	U	ug/m3	3.7	1.7	07/09/2020 19:59		685781	10AIRJ
m&p-Xylene	1.39	< 0.53	U	ug/m3	2.5	0.53	07/09/2020 19:59		685781	10AIRJ
o-Xylene	1.39	< 0.24	U	ug/m3	1.2	0.24	07/09/2020 19:59		685781	10AIRJ

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Client: UPRR_Golder

Client ID: AA-1620-AA-3-20200630 CERT 351 **Project ID:** 19119232.440 HWPW
Lab ID: 10523718002 **Moisture:** N/A **Pace Project** 10523718
Collected: 06/30/2020 11:07 **Received** 07/03/2020 09:30 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
Individual Can Certification	Analytical Method: TO-15									
Benzene	0.5	< 0.065	U	ug/m3	0.16	0.065	06/19/2020 08:25		685050	10AIRJ
Ethylbenzene	0.5	< 0.069	U	ug/m3	0.44	0.069	06/19/2020 08:25		685050	10AIRJ
Naphthalene	0.5	< 0.64	U	ug/m3	1.3	0.64	06/19/2020 08:25		685050	10AIRJ
m&p-Xylene	0.5	< 0.17	U	ug/m3	0.88	0.17	06/19/2020 08:25		685050	10AIRJ
o-Xylene	0.5	< 0.074	U	ug/m3	0.44	0.074	06/19/2020 08:25		685050	10AIRJ

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Client: UPRR_Golder

Client ID: GS-1620-SG25-20200630 **Project ID:** 19119232.440 HWPW
Lab ID: 10523718003 **Moisture:** N/A **Pace Project** 10523718
Collected: 06/30/2020 10:52 **Received** 07/03/2020 09:30 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
TO15 MSV AIR	Analytical Method: TO-15									
Benzene	1.94	< 0.25	U	ug/m3	0.63	0.25	07/09/2020 20:34		685781	10AIRJ
Ethylbenzene	1.94	< 0.32	U	ug/m3	1.7	0.32	07/09/2020 20:34		685781	10AIRJ
Naphthalene	1.94	< 2.4	U	ug/m3	5.2	2.4	07/09/2020 20:34		685781	10AIRJ
m&p-Xylene	1.94	< 0.74	U	ug/m3	3.4	0.74	07/09/2020 20:34		685781	10AIRJ
o-Xylene	1.94	< 0.34	U	ug/m3	1.7	0.34	07/09/2020 20:34		685781	10AIRJ

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Client: UPRR_Golder

Client ID: GS-1620-SG25-20200630 CERT 306 **Project ID:** 19119232.440 HWPW
Lab ID: 10523718004 **Moisture:** N/A **Pace Project** 10523718
Collected: 06/30/2020 10:52 **Received** 07/03/2020 09:30 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
Individual Can Certification	Analytical Method: TO-15									
Benzene	1	< 0.13	U	ug/m3	0.32	0.13	06/18/2020 08:56		685050	10AIRJ
Ethylbenzene	1	< 0.14	U	ug/m3	0.88	0.14	06/18/2020 08:56		685050	10AIRJ
Naphthalene	1	< 1.3	U	ug/m3	2.7	1.3	06/18/2020 08:56		685050	10AIRJ
m&p-Xylene	1	< 0.34	U	ug/m3	1.8	0.34	06/18/2020 08:56		685050	10AIRJ
o-Xylene	1	< 0.15	U	ug/m3	0.88	0.15	06/18/2020 08:56		685050	10AIRJ

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Client: UPRR_Golder

Client ID: GS-1620-SG27-20200630 **Project ID:** 19119232.440 HWPW
Lab ID: 10523718005 **Moisture:** N/A **Pace Project** 10523718
Collected: 06/30/2020 11:50 **Received** 07/03/2020 09:30 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
TO15 MSV AIR	Analytical Method: TO-15									
Benzene	1.87	**12.4**		ug/m3	0.61	0.24	07/09/2020 21:09		685781	10AIRJ
Ethylbenzene	1.87	**7.9**		ug/m3	1.7	0.30	07/09/2020 21:09		685781	10AIRJ
Naphthalene	1.87	< 2.3	U	ug/m3	5.0	2.3	07/09/2020 21:09		685781	10AIRJ
m&p-Xylene	1.87	**21.2**		ug/m3	3.3	0.72	07/09/2020 21:09		685781	10AIRJ
o-Xylene	1.87	**6.2**		ug/m3	1.7	0.33	07/09/2020 21:09		685781	10AIRJ

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Client: UPRR_Golder

Client ID: GS-1620-SG27-20200630 CERT 362 **Project ID:** 19119232.440 HWPW
Lab ID: 10523718006 **Moisture:** N/A **Pace Project** 10523718
Collected: 06/30/2020 11:50 **Received** 07/03/2020 09:30 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
Individual Can Certification	Analytical Method: TO-15									
Benzene	1	**0.18**	J	ug/m3	0.32	0.13	06/17/2020 16:09		685050	10AIRH
Ethylbenzene	1	< 0.14	U	ug/m3	0.88	0.14	06/17/2020 16:09		685050	10AIRH
Naphthalene	1	< 1.3	U	ug/m3	2.7	1.3	06/17/2020 16:09		685050	10AIRH
m&p-Xylene	1	< 0.34	U	ug/m3	1.8	0.34	06/17/2020 16:09		685050	10AIRH
o-Xylene	1	< 0.15	U	ug/m3	0.88	0.15	06/17/2020 16:09		685050	10AIRH

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Client: UPRR_Golder

Client ID: GS-1620-Dup-3-20200630 **Project ID:** 19119232.440 HWPW
Lab ID: 10523718007 **Moisture:** N/A **Pace Project** 10523718
Collected: 06/30/2020 11:50 **Received** 07/03/2020 09:30 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
TO15 MSV AIR	Analytical Method: TO-15									
Benzene	1.83	**1.5**		ug/m3	0.59	0.23	07/09/2020 21:45		685781	10AIRJ
Ethylbenzene	1.83	**2.2**		ug/m3	1.6	0.30	07/09/2020 21:45		685781	10AIRJ
Naphthalene	1.83	< 2.3	U	ug/m3	4.9	2.3	07/09/2020 21:45		685781	10AIRJ
m&p-Xylene	1.83	**7.7**		ug/m3	3.2	0.70	07/09/2020 21:45		685781	10AIRJ
o-Xylene	1.83	**3.1**		ug/m3	1.6	0.32	07/09/2020 21:45		685781	10AIRJ

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Client: UPRR_Golder

Client ID: GS-1620-Dup-3-20200630 CERT 28 **Project ID:** 19119232.440 HWPW
Lab ID: 10523718008 **Moisture:** N/A **Pace Project** 10523718
Collected: 06/30/2020 11:50 **Received** 07/03/2020 09:30 **Matrix:** Air

Parameters	DF	Results	Qual	Units	MQL	SDL	Analysis Date	Prep Date	Batch	Instr.
Individual Can Certification	Analytical Method: TO-15									
Benzene	1	< 0.13	U	ug/m3	0.32	0.13	06/19/2020 09:09		685050	10AIRD
Ethylbenzene	1	< 0.14	U	ug/m3	0.88	0.14	06/19/2020 09:09		685050	10AIRD
Naphthalene	1	< 1.3	U	ug/m3	2.7	1.3	06/19/2020 09:09		685050	10AIRD
m&p-Xylene	1	< 0.34	U	ug/m3	1.8	0.34	06/19/2020 09:09		685050	10AIRD
o-Xylene	1	< 0.15	U	ug/m3	0.88	0.15	06/19/2020 09:09		685050	10AIRD

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Batch: 685781
Method: TO-15

Pace Project No.: 10523718
Instrument ID: 10AIRJ

Blank: 3667712

Parameters	Dilutio	Quals	Result	Units	MQL	SDL	Analysis Date	Prep Date
Benzene	0.5	U	<0.064	ug/m3	0.16	0.064	07/09/2020 13:15	
Ethylbenzene	0.5	U	<0.082	ug/m3	0.44	0.082	07/09/2020 13:15	
Naphthalene	0.5	U	<0.62	ug/m3	1.3	0.62	07/09/2020 13:15	
m&p-Xylene	0.5	U	<0.19	ug/m3	0.88	0.19	07/09/2020 13:15	
o-Xylene	0.5	U	<0.088	ug/m3	0.44	0.088	07/09/2020 13:15	

Laboratory Control Sample: 3667713

Parameters	Spk Amt	LCS Result	Units	LCS %Rec	% Rec Limits	LCS Quals
Benzene	33.5	27.0	ug/m3	80	70-133	
Ethylbenzene	45.6	36.3	ug/m3	80	70-142	
Naphthalene	57.7	54.0	ug/m3	94	63-130	
m&p-Xylene	91.2	72.6	ug/m3	80	70-141	
o-Xylene	45.5	34.9	ug/m3	77	70-135	

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Pace Project 10523718

Analyte	Method	Unadjusted MQL	Reporting Units
Benzene	TO-15	0.33	ug/m3
Ethylbenzene	TO-15	0.88	ug/m3
Naphthalene	TO-15	2.7	ug/m3
m&p-Xylene	TO-15	1.8	ug/m3
o-Xylene	TO-15	0.88	ug/m3

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Pace Project 10523718

DEFINITIONS

DF	Dilution Factor
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting
U	Indicates the compound was analyzed for, but not detected.
SDL	Sample Detection Limit
MQL	Method Quantitation Limit
LCS(D)	Laboratory Control Sample (Duplicate)
MS(D)	Matrix Spike (Duplicate)
DUP	Sample Duplicate
RPD	Relative Percent Difference
TNI	The Nelac Institute

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

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Quality Control Data
Cross Reference Table

Pace Project 10523718

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical
10523718002	**AA-1620-AA-3-20200630 CERT**	TO-15	685050	
10523718004	**GS-1620-SG25-20200630 CERT**	TO-15	685050	
10523718006	**GS-1620-SG27-20200630 CERT**	TO-15	685050	
10523718008	**GS-1620-Dup-3-20200630 CERT**	TO-15	685050	
10523718001	**AA-1620-AA-3-20200630**	TO-15	685781	
10523718003	**GS-1620-SG25-20200630**	TO-15	685781	
10523718005	**GS-1620-SG27-20200630**	TO-15	685781	
10523718007	**GS-1620-Dup-3-20200630**	TO-15	685781	

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AIR: CHAIN-OF-CUSTODY / Analytical Request Document

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

47553

Page: 1 of 1

Section A Required Client Information:

Company: Golder Associates
Address: 2201 Double Creek dr. Suite 4004
Email To: Eric Matzner
Phone: 5126713434 Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: Eric Matzner
Copy To: Michelle Hermiston
Purchase Order No.:
Project Name: HWPW
Project Number: 19119232.440

Section C Invoice Information:

Attention: UPRR Kevin Peterbours
Company Name: Union Pacific Railroad
Address: 1400 Douglas street 0750
Pace Quote Reference:
Pace Project Manager/Sales Rep.
Pace Profile #: 40791

Program: ☐ UST ☐ Superfund ☐ Emissions ☐ Clean Air Act ☐ Voluntary Clean Up ☐ Dry Clean ☐ RCRA ☐ Other

Location of Sampling by State: TX

Reporting Units: ug/m³ ___ mg/m³ ___ PPBV ___ PPMV ___ Other ___

Report Level II.___ III.___ IV.___ Other___

'Section D Required Client Information

AIR SAMPLE ID
Sample IDs MUST BE UNIQUE

Valid Media Codes

MEDIA	CODE
Tedlar Bag	TB
1 Liter Summa Can	1LC
6 Liter Summa Can	6LC
Low Volume Puff	LVP
High Volume Puff	HVP
Other	PM10

ITEM #	'Section D Required Client Information / AIR SAMPLE ID	MEDIA CODE	PID Reading (Client only)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE - END/GRAB DATE	COMPOSITE - END/GRAB TIME	Canister Pressure (Initial Field - in Hg)	Canister Pressure (Final Field - in Hg)	Summa Can Number	Flow Control Number	Method: PM10	3C - Fixed Gas (%)	TO-3 BTEX	TO-3M (Methane)	TO-14	TO-15 Full List VOCs	TO-15 Short List BTEX	TO-15 Short List Chlorinated	TO-15 Short List (other)	Pace Lab ID
1	AA-1620-AA-3-20200630			6-30-20	1007	11	1107	30	0	3518	1130						X				Please 001/002
2	GS-1620-SG25-20200630				1043		1052	30	2	3067	0634						X				refer 003/004
3	SG27				1135		1150	30	2	3625	0775						X				to specific 005/006
4	Dup-3				1135		1150	30	2	2887	0775						X				Short list 007/008
5																					provided 009
6																					by the PM 010
7																					011
8																					012
9																					013
10																					014
11																					
12																					

WO#: 10523718

10523718

Comments :

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	6-30-20	1800	Pace	7/3/20	0930

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Anthony Reid

SIGNATURE of SAMPLER:

DATE Signed (MM / DD / YY): 06 30 20

SAMPLE CONDITIONS	-	Y/N	Y/N	Y/N
		Y/N	Y/N	Y/N
		Y/N	Y/N	Y/N
		Y/N	Y/N	Y/N
	Temp in °C	Received on Ice	Custody Sealed Cooler	Samples Intact

ORIGINAL

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414 Air Technical Phone: 612.607.6386

Pace Analytical®	Document Name: **Sample Condition Upon Receipt (SCUR) - Air**	Document Revised: 24Mar2020 **Page 1 of 1**
	Document No.: **ENV-FRM-MIN4-0113 Rev.00**	Pace Analytical Services - Minneapolis

Air Sample Condition Upon Receipt **Client Name:** **Project #:**

WO#: 10523718

PM: NB3 **Due Date: 07/10/20**

CLIENT: UPRR_Golder

Courier: ☐Fed Ex ☐UPS ☐USPS ☐Client ☐Pace ☐SpeeDee ☐Commercial **See Exception** ☐

Tracking Number: 1723 2543 5477/5488

Custody Seal on Cooler/Box Present? ☒Yes ☐No **Seals Intact?** ☒Yes ☐No

Packing Material: ☐Bubble Wrap ☐Bubble Bags ☒Foam ☐None ☐Tin Can ☐Other:_____ **Temp Blank rec:** ☐Yes ☒No

Temp. (TO17 and TO13 samples only) (°C): - **Corrected Temp (°C):** -

Thermometer Used: ☐G87A9170600254 ☐G87A9155100842

Temp should be above freezing to 6°C **Correction Factor:** - **Date & Initials of Person Examining Contents:** CEG 7/3/20

Type of ice Received ☐Blue ☐Wet ☒None

		Comments:
Chain of Custody Present?	☒Yes ☐No	1.
Chain of Custody Filled Out?	☒Yes ☐No	2.
Chain of Custody Relinquished?	☒Yes ☐No	3.
Sampler Name and/or Signature on COC?	☒Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time?	☒Yes ☐No	5.
Short Hold Time Analysis (<72 hr)?	☐Yes ☒No	6.
Rush Turn Around Time Requested?	☐Yes ☒No	7.
Sufficient Volume?	☒Yes ☐No	8.
Correct Containers Used? **(Tedlar bags not acceptable container for TO-14, TO-15 or APH)** -Pace Containers Used?	☒Yes ☐No ☒Yes ☐No	9.
Containers Intact? **(visual inspection/no leaks when pressurized)**	☒Yes ☐No	10.
Media: (Air Can) Airbag Filter TDT Passive		11. Individually Certified Cans (Y) N (list which samples)
Is sufficient information available to reconcile samples to the COC?	☒Yes ☐No	12.
Do cans need to be pressurized? **(DO NOT PRESSURIZE 3C or ASTM 1946!!!)**	☒Yes ☐No	13.

Gauge # ☒10AIR26 ☐10AIR34 ☐10AIR35 ☐4097

Canisters					Canisters				
Sample Number	Can ID	Flow Controller	Initial Pressure	Final Pressure	Sample Number	Can ID	Flow Controller	Initial Pressure	Final Pressure
AA3	3518	1130	-1	5	Unused	2731	1136	-27.5	-
SG-25	3067	0634	-4	10	"	3213	0779	-26	-
SG-27	3625	0775	-3	10					
Dup 3	2887	0775	-2.5	10					
Unused	2905	-	-28	-					
"	2864	1732	-24	-					
"	3127	1161	-28	-					
"	0999	0735	-27	-					

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: Joanne Richardson **Date:** 7-7-20

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)