June 28, 2019 Project No. 30401358

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

RE: MONTHLY STATUS UPDATE – ENGLEWOOD INTERMODAL YARD – NAPL COLLECTION SYSTEM/CONCRETE CAP REPAIRS
UNION PACIFIC RAILROAD HOUSTON WOOD PRESERVING WORKS FACILITY
4910 LIBERTY ROAD FACILITY, HOUSTON, TEXAS
POST-CLOSURE CARE PERMIT NO. HW-50343; INDUSTRIAL SWR NO. 31547

Dear Ms. Hatfield:

Golder Associates, Inc. (Golder), on behalf of Union Pacific Railroad Company (UPRR), is pleased to provide this monthly status update for June 2019 for the implementation of the cap repairs identified in the Updated Post-Response Action Care Report (PRACR) dated January 16, 2018 for the UPRR Houston Wood Preserving Works Facility (the Site). Monthly status updates were requested by the Texas Commission on Environmental Quality (TCEQ) in a letter dated March 20, 2018. A brief description of the current status of the repairs is provided below:

The non-aqueous phase liquid (NAPL) Collection System was installed in the Englewood Intermodal Yard to address the tar-like substance seeps within parking slots B100 to B109 (for container trailers). The following is a summary of the observations from the weekly inspections of the NAPL Collection System for June (photographs provided in Attachment A):

- No significant amount of NAPL has been visually observed within the three NAPL collection sumps (Sump 1 (B099/B100 slots), Sump 2 (B103/B104 slots), and Sump 3 (B107/B108 slots)). As discussed in the May 2019 Monthly Update, water in the sumps was pumped out on May 9th and again on May 24, 2019. During the May 24, 2019 pump down, NAPL with the water was noted in the vacuum truck, and the fluids were transferred to a frac tank to be stored at the Site following additional characterization. Samples of the fluids (NAPL and recovered water) were collected on May 24, 2019, and the analytical results are provided in Attachment B. The analytical results of the NAPL indicate the material is significantly different from the testing previously conducted on the tar-like substance encountered in the seep areas and when the NAPL Collection System was installed. The recovered NAPL from the May 24th pump down has a larger percentage of C6-C12 fraction compared to the tar-like substance, as shown on Table 1. UPRR is evaluating additional analyses to assess the

Golder Associates Inc.
2201 Double Creek Dr, Suite 4004, Round Rock, Texas, USA 78664 T: +1 512 671-3434 F: +1 512 671-3446

source of the NAPL recovered from the NAPL Collection System. Based on the analytical results of the fluids, UPRR is evaluating recycling options for the recovered fluids.

- During June, none of the tar-like material seeps were noted on the south end of stall B106 along the concrete joint with the NAPL Collection System.

- For areas outside the NAPL Collection System, very small amounts of tar-like material were noted near or within parking slots B013, B057, B096, B101, B102, B105, and B108 where previous seeps have been observed. The small amount of observed tar-like material was scrapped up and placed on a drum on site. A small amount of tar-like material was also noted at slot A010 north of the B-Row on June 6, 2019.

- About 1.5 to 2 gallons of tar-like material were scrapped up during the weekly inspections from June 6 to June 26, 2019, and placed in a drum for storage pending profiling and disposal.

- Areas of brown stains on the concrete pavement and evidence of seeps of a dark brown to black water were observed along cracks in the pavement and low-lying areas. The staining and seeps were observed throughout the B-Row (predominately in the B090 – B098 area) but were also observed within the A-Row (Slots A023, A037, and A075) and C-Row. On June 6, 2019, Golder collected field measurements using a photoionization detector (PID) in the areas where the seeps were observed. There were no PID readings noted above background for the area. On May 31 and June 7, UPRR contractor United States Environmental Services (USES) was called to the Site to pressure wash the areas and collect the fluids, which were placed in a tote on site. USES returned to the site on June 21, 2019 to pressure washed the area, but the seep areas had dried. A sample of the recovered water stored in the tote was collected for characterization to evaluate if there are any petroleum hydrocarbons present. The final laboratory report will be submitted in the July 2019 Monthly Update. UPRR will continue to have USES conduct weekly site visits as necessary to recover the water from the seep areas.

Weekly site inspections of the NAPL Collection System and Englewood Intermodal Yard concrete pavement near the collection system will continue to be conducted. Details of the characterization of the seep water will be provided in the next monthly update for July 2019.

If you have any questions or need additional information, please feel free to call me at (512) 671-3434 or Mr. Kevin Peterburs of UPRR at (414) 267-4164.

Sincerely,

Golder Associates Inc.

Eric C. Matzner, P.G.
Program Leader/ Associate

ECM

CC: Mr. Kevin Peterburs, UPRR – Milwaukee, WI
Ms. Alma Jefferson, Waste Section Manager, TCEQ Region 12, Houston

Attachments A - Photographic Log – June 2019
B - NAPL Collection System NAPL/Water Sample Laboratory Reports

https://golderassociates-my.sharepoint.com/personal/ematzner_golder_com/documents/documents/hwpw/houston, tx - wood preserving works - swr 31547 - monthly status update - cap repairs 20190628.docx

Table

Table 1

Summary of NAPL Sample Analytical Results
Englewood Intermodal Yard - Seep Investigation

Analyte	Units	NAPL-1620-TPB105-20181005	NAPL-1620-TPB100-20181005	NAPL-1620-TPB54-20181005	NAPL-1620-TPB13-20181005	NAPL-1620-NCS_Oil-20190524
Comment		*Tar sample from test pit at Slot B105*	*Tar sample from test pit at Slot B100*	*Tar sample from test pit at Slot B105*	*Tar sample from test pit at Slot B105*	*Sample of NAPL from NAPL Collection System sumps*
Sample Date		5/10/2018	5/10/2018	5/10/2018	5/10/2018	5/24/2019
Volatile Organic Compounds (SW8260)						
Benzene	mg/Kg	0.012 J	0.017 J	<0.0041	<0.0045	210
Ethylbenzene	mg/Kg	0.092	0.21	0.033 J	0.039 J	2200
m,p-Xylene	mg/Kg	0.031 J	0.048 J	0.048 J	0.035 J	940
o-Xylene	mg/Kg	0.051	0.11	0.046	0.064	380
Toluene	mg/Kg	0.029 J	0.038 J	0.030 J	0.085	870
Xylenes, Total	mg/Kg	0.082	0.16	0.094	0.099	1,300
Total Petroleum Hydrocarbons (TX1005)						
nC6 to nC12	mg/Kg	5,000	1,100 J	1,600 J	1,800 J	350,000
>nC12 to nC28	mg/Kg	17,000	31,000	29,000	19,000	150,000
>nC28 to nC35	mg/Kg	2,100 J	3,300 J	2,300 J	2,400 J	50,000
Total Petroleum Hydrocarbon	mg/Kg	24,000	35,000	33,000	23,000	550,000
Total Petroleum Hydrocarbons (TX1006)						
Aliphatics nC6	mg/Kg	0	0	0	0	<4,900
Aliphatics >nC6 to nC8	mg/Kg	<4.9	<4.8	<4.7	<4.9	28,000
Aliphatics >nC8 to nC10	mg/Kg	<4.9	<4.8	<4.7	<4.9	330,000
Aliphatics >nC10 to nC12	mg/Kg	<4.9	<4.8	<4.7	<4.9	21,000
Aliphatics >nC12 to nC16	mg/Kg	<4.9	<4.8	24	<4.9	60,000
Aliphatics >nC16 to nC21	mg/Kg	19	47	55	12	23,000
Aliphatics >nC21 to nC35	mg/Kg	34	50	32	9.5 J	34,000
Aliphatics Relative % Distribution	*%*	*30*	*36*	*49*	*26*	*90*
Aromatics >nC7 to nC8	mg/Kg	<490	<480	<470	<490	<4,900
Aromatics >nC8 to nC10	mg/Kg	<490	<480	<470	<490	22,000
Aromatics >nC10 to nC12	mg/Kg	<490	<480	<470	<490	9,500 J
Aromatics >nC12 to nC16	mg/Kg	1,000	1,800	1,400	1,400	20,000
Aromatics >nC16 to nC21	mg/Kg	5,400	8,300	4,800	2,900	6,300 J
Aromatics >nC21 to nC35	mg/Kg	5,700	7,800	5,200	2,500	<4,900
Aromatics Relative % Distribution	*%*	*70*	*64*	*51*	*74*	*10*
Total Petroleum Hydrocarbons	mg/Kg	12,153	17,997	11,511	6,822	550,000

Notes:
Results with a "<" indicate that the analyte was analyzed but not detected above the Method Detection Limit (MDL).
Results with a "J" flag indicate that the analyte was detected above the MDL but below the quantitation limit.

ATTACHMENT A

Photographic Log - June 2019

GOLDER

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Union Pacific Railroad	Englewood Intermodal Yard/Houston Wood Preserving Works, 4910 Liberty Road, Houston, Texas	19119232

Photo No.	Date:
1	6/06/19

Description:

Slot A010:
View of small tar-like seep at concrete joint, looking east.

Photo No.	Date:
2	06/06/19

Description:

Slots A023/B/023:
View of slot A023/B023, looking south, dried up area of water seep, looking south.

GOLDER

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Union Pacific Railroad	Englewood Intermodal Yard/Houston Wood Preserving Works, 4910 Liberty Road, Houston, Texas	19119232

Photo No.	Date:
3	06/06/19

Description:

Slots A075 / B075:
View of south end of A075 (B075 in foreground), note dark brown colored seep area, looking south.

Photo No.	Date:
4	06/06/19

Description:

Slots B089 to B100:
View of slots B089 to B100, areas where dark stained water seeps were previously noted, areas damp, seep areas appear along joints in the pavement, looking west.

GOLDER

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Union Pacific Railroad	Englewood Intermodal Yard/Houston Wood Preserving Works, 4910 Liberty Road, Houston, Texas	19119232

Photo No.	Date:
5	06/06/19

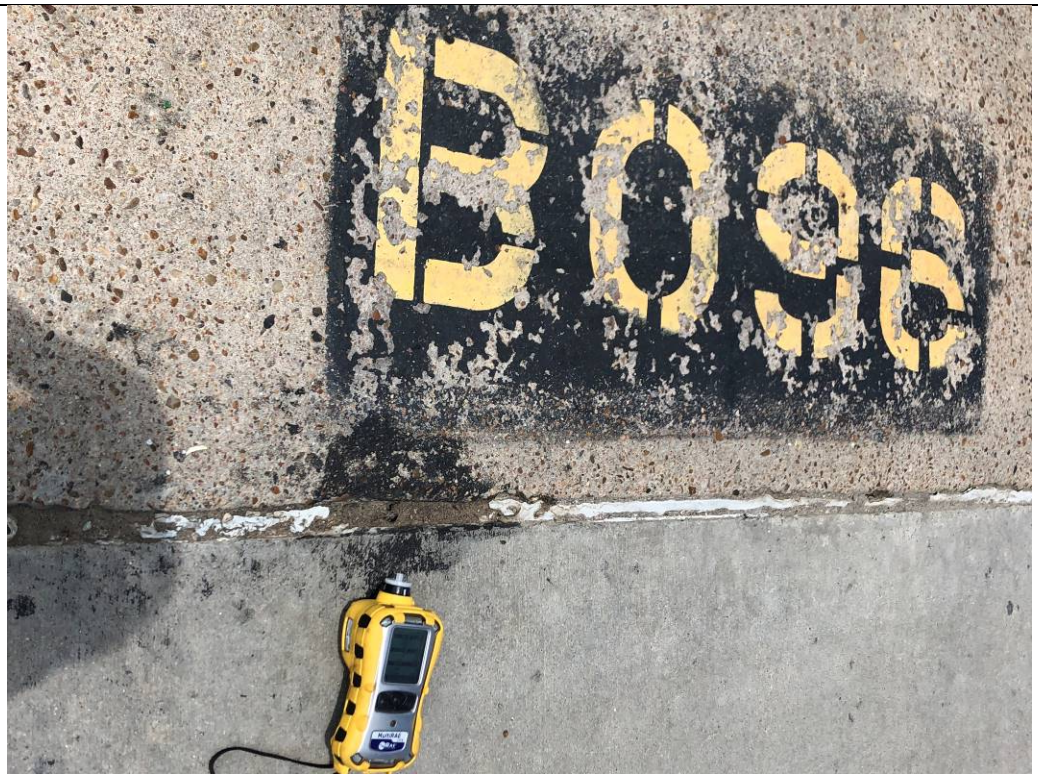
Description:

Slot B097:
View of Slot B097 standing water with brown staining, looking west.

Photo No.	Date:
6	06/06/19

Description:

Slot B096:
View of slot B096, looking east, very little tar-like material observed in concrete joint.



GOLDER

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Union Pacific Railroad	Englewood Intermodal Yard/Houston Wood Preserving Works, 4910 Liberty Road, Houston, Texas	19119232

Photo No.	Date:
7	06/06/19

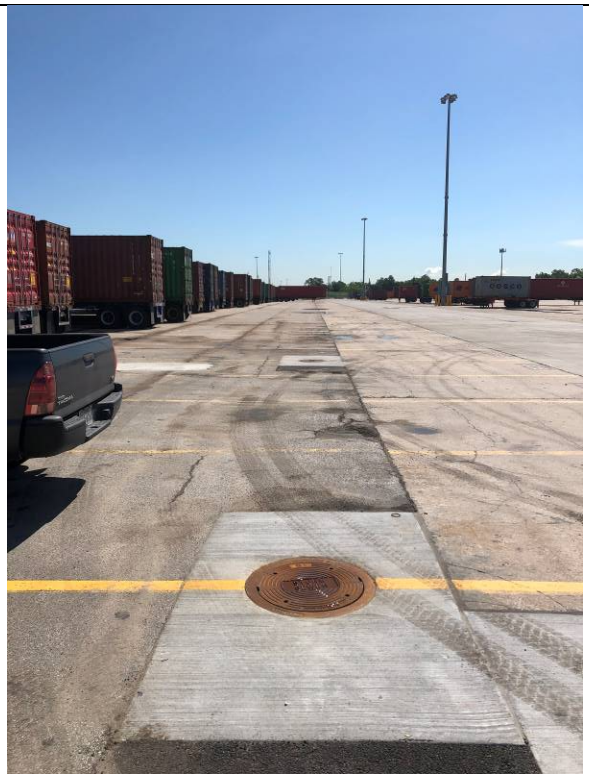
Description:

Slot B102:
View of slot B102 looking north, little tar-like seep at joint.

Photo No.	Date:
8	06/06/19

Description:

NAPL Sump B107/B018:
View of NAPL Collection Sump B107/B108, looking east across the B-Slot Row.



GOLDER

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Union Pacific Railroad	Englewood Intermodal Yard/Houston Wood Preserving Works, 4910 Liberty Road, Houston, Texas	19119232

Photo No.	Date:
9	06/12/19

Description:

Slot B013:
View of slot B013, little amount of tar-like material in cracks and joints of the asphalt.

Photo No.	Date:
10	06/12/19

Description:

Slot B096:
View of slot B096, looking east, very little tar-like material observed in concrete joint.

GOLDER

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Union Pacific Railroad	Englewood Intermodal Yard/Houston Wood Preserving Works, 4910 Liberty Road, Houston, Texas	19119232

Photo No.	Date:
11	06/12/19

Description:

Slot B098:
View of slot B098 looking north, areas of dark staining from seeps through the cracks in the asphalt.

Photo No.	Date:
12	05/28/19

Description:

Slot B101:
View of slot B101small amount of tar-like material seep.

GOLDER

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Union Pacific Railroad	Englewood Intermodal Yard/Houston Wood Preserving Works, 4910 Liberty Road, Houston, Texas	19119232

Photo No.	Date:
13	06/12/19

Description:

Slot B106:
View of slot B106, no tar-like material observed in concrete joint.

Photo No.	Date:
14	06/12/19

Description:

B099 NAPL Collection Sump:
View of B099 Sump, note brown stained water in the inflow protector.

GOLDER

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Union Pacific Railroad	Englewood Intermodal Yard/Houston Wood Preserving Works, 4910 Liberty Road, Houston, Texas	19119232

Photo No.	Date:
15	06/19/19

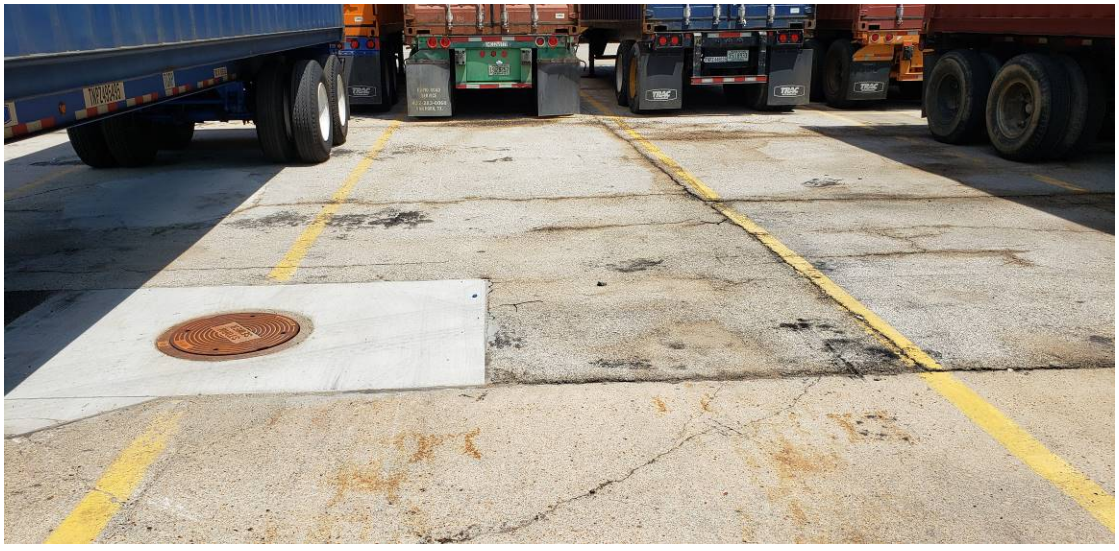
Description:

Slot B096:
View of slot B096, looking north, areas of dark staining from seeps through the cracks in the asphalt, seeps not active, dried up.

Photo No.	Date:
16	06/19/19

Description:

B099 NAPL Collection Sump:
View of B099 Sump, looking north note stains along cracks in asphalt, water dried up.



GOLDER

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Union Pacific Railroad	Englewood Intermodal Yard/Houston Wood Preserving Works, 4910 Liberty Road, Houston, Texas	19119232

Photo No.	Date:
17	06/19/19

Description:

Slot B101:
View of slot B101, small amount of tar-like material observed in crack in asphalt.

Photo No.	Date:
18	06/19/19

Description:

B107/B108 NAPL Collection Sump:
View of B107/B108 Sump, no sheen or odor noted in the water collected in the sump.

GOLDER

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Union Pacific Railroad	Englewood Intermodal Yard/Houston Wood Preserving Works, 4910 Liberty Road, Houston, Texas	19119232

Photo No.	Date:
19	06/26/19

Description:

Slot B096:
View of slot B096, looking north, no seeps noted, water puddles following rain event.

Photo No.	Date:
20	06/26/19

Description:

Slot B096:
View of slot B096, looking north, very little tar-like material noted in the concrete joint.

GOLDER

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Union Pacific Railroad	Englewood Intermodal Yard/Houston Wood Preserving Works, 4910 Liberty Road, Houston, Texas	19119232

Photo No.	Date:
21	06/26/19

Description:

Slot B092:
View of slot B092, small amount of staining along crack in asphalt, seep has dried up.

Photo No.	Date:
22	06/26/19

Description:

B099/B100 NAPL Collection Sump:
View of B099/B100 Sump, slight sheen and odor noted in the water collected in the sump.

GOLDER

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Union Pacific Railroad	Englewood Intermodal Yard/Houston Wood Preserving Works, 4910 Liberty Road, Houston, Texas	19119232

Photo No.	Date:
23	06/26/19

Description:

Slot B105:
View of slot BB105, small amount of tar-like material along crack in asphalt.

Photo No.	Date:
22	06/26/19

Description:

Slot B102:
View of Slot B102 little amount of tar-like material seep in concrete joint.

ATTACHMENT B

NAPL Collection System NAPL/Water Sample Laboratory Reports

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

May 30, 2019

Eric Matzner
Golder Associates Inc.
11231 Richmond Avenue
Suite D104
Houston, TX 77082

Work Order: **HS19051571**

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

Dear Eric,

ALS Environmental received 2 sample(s) on May 24, 2019 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:	**HS19051571**	

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:	**HS19051571**	

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: 05/30/2019					
Project Name: Houston TX-Wood Preserving Works			Laboratory Job Number: HS19051571					
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 141236,141252,141294,141304,141342,141427,R339261,R336262,R339317,R339477,R339494					
#[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				1
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			2
		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			3
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			4
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			5
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			6
		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				7
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				8

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 05/30/2019				
Project Name: Houston TX-Wood Preserving Works			Laboratory Job Number: HS19051571				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 141236,141252,141294,141304,141342,141427,R339261,R336262,R339317, R339477,R339494				
#[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: 05/30/2019
Project Name: Houston TX-Wood Preserving Works	Laboratory Job Number: HS19051571
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 141236,141252,141294,141304,141342,141427,R339261,R336262,R339317,R339477,R339494

ER#[5]	Description
1	Method could not be followed due to sample matrix (oily sludge). pH indicator paper was used to determine the pH result of 6.
2	Sample received outside method holding time for pH. pH is an immediate test. Sample results are flagged with an "H" qualifier. The temperature at the time of pH is reported. Please note that all pH results are already normalized to a temperature of 25 degrees C.
3	Semivolatile Organics Method SW8270, sample WSW-1620-NCS_Water-20190524, the surrogate recoveries could not be determined due to dilution below the calibration range.
4	Batch 141252, Semivolatile Organics Method SW8270, LCS/LCSD RPD was above the RPD limit for Benzidine and Pentachlorophenol. The individual recoveries were in control.
5	Batch 141252, Semivolatile Organics Method SW8270, LCS/LCSD were analyzed and reported in lieu of an MS/MSD for this batch.
6	Batch 141236, Metals Method SW6020, sample HS19051415-01, MSD was performed on unrelated sample.
7	Batch 141252, Semivolatile Organics Method SW8270, sample WSW-1620-NCS_Water-20190524, the GCMS semi-volatile extract of this sample was run at a dilution due to a high level of matrix interference.
8	Reactive Cyanide Method SW7.3.3.2 and Reactive Sulfide method SW7.3.4.2, TCEQ does not offer accreditation for these analytes, the results are flagged with n.

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: HS19051571

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19051571-01	NAPL-1620-NCS_Oil-20190524	Oil		24-May-2019 14:30	24-May-2019 17:50	☐
HS19051571-02	WSW-1620-NCS_Water-20190524	Water		24-May-2019 14:30	24-May-2019 17:50	☐

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: NAPL-1620-NCS_Oil-20190524
Collection Date: 24-May-2019 14:30

ANALYTICAL REPORT
WorkOrder:HS19051571
Lab ID:HS19051571-01
Matrix:Oil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
TCLP METALS BY SW6020A		**Method:SW1311/6020**	Leache:SW1311 / 29-May-2019	Prep:SW3010A / 29-May-2019			Analyst: JHD
Antimony	U		0.0400	0.500	mg/L	10	29-May-2019 18:47
Arsenic	U		0.0400	0.500	mg/L	10	29-May-2019 18:47
Barium	U		0.190	2.00	mg/L	10	29-May-2019 18:47
Beryllium	U		0.0200	0.200	mg/L	10	29-May-2019 18:47
Cadmium	U		0.0200	0.500	mg/L	10	29-May-2019 18:47
Chromium	U		0.0400	0.500	mg/L	10	29-May-2019 18:47
Lead	**0.126**	J	**0.0600**	**0.500**	**mg/L**	10	29-May-2019 18:47
Nickel	U		0.0600	0.500	mg/L	10	29-May-2019 18:47
Selenium	U		0.110	0.500	mg/L	10	29-May-2019 18:47
Silver	U		0.0200	0.500	mg/L	10	29-May-2019 18:47
Vanadium	U		0.0600	0.500	mg/L	10	29-May-2019 18:47
TCLP MERCURY BY SW7470A		**Method:SW7470**	Leache:SW1311 / 29-May-2019	Prep:SW7470 / 30-May-2019			Analyst: FO
Mercury	**0.00199**	J	**0.000300**	**0.00200**	**mg/L**	1	30-May-2019 15:01
FLASH POINT BY PENSKY-MARTENS SW1010A		**Method:SW1010**					Analyst: KAH
Ignitability	**78.8**		**70.0**	**70.0**	**°F**	1	30-May-2019 13:50
REACTIVE CYANIDE		**Method:SW7.3.3.2**		Prep:SW7.3.3.2			Analyst: KVL
Reactive Cyanide	U	n	100	100	mg/Kg	1	28-May-2019 12:00
REACTIVE SULFIDE		**Method:SW7.3.4.2**					Analyst: KVL
Reactive Sulfide	U	n	100	100	mg/Kg	1	28-May-2019 14:00
PH SOIL BY SW9045D		**Method:SW9045D**					Analyst: MWG
pH	See Narrative	H	0.100	0.100	pH Units	1	30-May-2019 13:30

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: WSW-1620-NCS_Water-20190524
Collection Date: 24-May-2019 14:30

ANALYTICAL REPORT
WorkOrder:HS19051571
Lab ID:HS19051571-02
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**						Analyst: AKP
1,1,1-Trichloroethane	U		0.020	0.10	mg/L	100	29-May-2019 07:34
1,1,2,2-Tetrachloroethane	U		0.050	0.10	mg/L	100	29-May-2019 07:34
1,1,2-Trichloroethane	U		0.030	0.10	mg/L	100	29-May-2019 07:34
1,1-Dichloroethane	U		0.020	0.10	mg/L	100	29-May-2019 07:34
1,1-Dichloroethene	U		0.020	0.10	mg/L	100	29-May-2019 07:34
1,2-Dichlorobenzene	U		0.050	0.10	mg/L	100	29-May-2019 07:34
1,2-Dichloroethane	U		0.020	0.10	mg/L	100	29-May-2019 07:34
1,2-Dichloropropane	U		0.050	0.10	mg/L	100	29-May-2019 07:34
1,3-Dichlorobenzene	U		0.040	0.10	mg/L	100	29-May-2019 07:34
1,4-Dichlorobenzene	U		0.040	0.10	mg/L	100	29-May-2019 07:34
2-Butanone	U		0.050	0.20	mg/L	100	29-May-2019 07:34
2-Hexanone	U		0.10	0.20	mg/L	100	29-May-2019 07:34
4-Methyl-2-pentanone	**0.52**		**0.070**	**0.20**	**mg/L**	100	29-May-2019 07:34
Acetone	U		0.20	0.20	mg/L	100	29-May-2019 07:34
Benzene	**1.4**		**0.020**	**0.10**	**mg/L**	100	29-May-2019 07:34
Bromochloromethane	U		0.020	0.10	mg/L	100	29-May-2019 07:34
Bromodichloromethane	U		0.020	0.10	mg/L	100	29-May-2019 07:34
Bromoform	U		0.040	0.10	mg/L	100	29-May-2019 07:34
Bromomethane	U		0.040	0.10	mg/L	100	29-May-2019 07:34
Carbon disulfide	U		0.060	0.20	mg/L	100	29-May-2019 07:34
Carbon tetrachloride	U		0.050	0.10	mg/L	100	29-May-2019 07:34
Chlorobenzene	U		0.030	0.10	mg/L	100	29-May-2019 07:34
Chloroethane	U		0.030	0.10	mg/L	100	29-May-2019 07:34
Chloroform	U		0.020	0.10	mg/L	100	29-May-2019 07:34
Chloromethane	U		0.020	0.10	mg/L	100	29-May-2019 07:34
cis-1,2-Dichloroethene	U		0.020	0.10	mg/L	100	29-May-2019 07:34
cis-1,3-Dichloropropene	U		0.010	0.10	mg/L	100	29-May-2019 07:34
Dibromochloromethane	U		0.030	0.10	mg/L	100	29-May-2019 07:34
Ethylbenzene	**2.4**		**0.030**	**0.10**	**mg/L**	100	29-May-2019 07:34
m,p-Xylene	**0.83**		**0.050**	**0.20**	**mg/L**	100	29-May-2019 07:34
Methylene chloride	**0.42**		**0.10**	**0.20**	**mg/L**	100	29-May-2019 07:34
o-Xylene	**0.40**		**0.030**	**0.10**	**mg/L**	100	29-May-2019 07:34
Styrene	**0.098**	J	**0.030**	**0.10**	**mg/L**	100	29-May-2019 07:34
Tetrachloroethene	U		0.030	0.10	mg/L	100	29-May-2019 07:34
Toluene	**2.1**		**0.020**	**0.10**	**mg/L**	100	29-May-2019 07:34
trans-1,2-Dichloroethene	U		0.020	0.10	mg/L	100	29-May-2019 07:34
trans-1,3-Dichloropropene	U		0.020	0.10	mg/L	100	29-May-2019 07:34
Trichloroethene	U		0.020	0.10	mg/L	100	29-May-2019 07:34
Vinyl acetate	U		0.050	0.10	mg/L	100	29-May-2019 07:34

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: WSW-1620-NCS_Water-20190524
Collection Date: 24-May-2019 14:30

ANALYTICAL REPORT
WorkOrder:HS19051571
Lab ID:HS19051571-02
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**					Analyst: AKP
Vinyl chloride	U		0.020	0.10	mg/L	100	29-May-2019 07:34
Xylenes, Total	**1.2**		**0.030**	**0.10**	**mg/L**	100	29-May-2019 07:34
1,2-Dichloroethene, Total	U		0.020	0.10	mg/L	100	29-May-2019 07:34
Surr: 1,2-Dichloroethane-d4	*104*			*70-126*	*%REC*	*100*	*29-May-2019 07:34*
Surr: 4-Bromofluorobenzene	*93.8*			*81-113*	*%REC*	*100*	*29-May-2019 07:34*
Surr: Dibromofluoromethane	*102*			*77-123*	*%REC*	*100*	*29-May-2019 07:34*
Surr: Toluene-d8	*104*			*82-127*	*%REC*	*100*	*29-May-2019 07:34*

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: WSW-1620-NCS_Water-20190524
Collection Date: 24-May-2019 14:30

ANALYTICAL REPORT
WorkOrder:HS19051571
Lab ID:HS19051571-02
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D	**Method:SW8270**				Prep:SW3510 / 28-May-2019		Analyst: GEY
1,2,4-Trichlorobenzene	U		0.0091	0.061	mg/L	100	29-May-2019 22:37
2,4,5-Trichlorophenol	U		0.017	0.061	mg/L	100	29-May-2019 22:37
2,4,6-Trichlorophenol	U		0.015	0.061	mg/L	100	29-May-2019 22:37
2,4-Dichlorophenol	U		0.013	0.061	mg/L	100	29-May-2019 22:37
2,4-Dimethylphenol	**0.14**		**0.012**	**0.061**	**mg/L**	100	29-May-2019 22:37
2,4-Dinitrophenol	U		0.030	0.30	mg/L	100	29-May-2019 22:37
2,4-Dinitrotoluene	U		0.018	0.061	mg/L	100	29-May-2019 22:37
2,6-Dinitrotoluene	U		0.013	0.061	mg/L	100	29-May-2019 22:37
2-Chloronaphthalene	U		0.0064	0.061	mg/L	100	29-May-2019 22:37
2-Chlorophenol	U		0.011	0.061	mg/L	100	29-May-2019 22:37
2-Methylnaphthalene	**0.99**		**0.0058**	**0.030**	**mg/L**	100	29-May-2019 22:37
2-Methylphenol	**0.069**		**0.014**	**0.061**	**mg/L**	100	29-May-2019 22:37
2-Nitroaniline	U		0.012	0.061	mg/L	100	29-May-2019 22:37
2-Nitrophenol	U		0.010	0.061	mg/L	100	29-May-2019 22:37
3&4-Methylphenol	**0.13**		**0.011**	**0.061**	**mg/L**	100	29-May-2019 22:37
3,3´-Dichlorobenzidine	U		0.013	0.061	mg/L	100	29-May-2019 22:37
3-Nitroaniline	U		0.015	0.061	mg/L	100	29-May-2019 22:37
4,6-Dinitro-2-methylphenol	U		0.0061	0.061	mg/L	100	29-May-2019 22:37
4-Bromophenyl phenyl ether	U		0.015	0.061	mg/L	100	29-May-2019 22:37
4-Chloro-3-methylphenol	U		0.0097	0.061	mg/L	100	29-May-2019 22:37
4-Chloroaniline	U		0.012	0.061	mg/L	100	29-May-2019 22:37
4-Chlorophenyl phenyl ether	U		0.013	0.061	mg/L	100	29-May-2019 22:37
4-Nitroaniline	U		0.011	0.061	mg/L	100	29-May-2019 22:37
4-Nitrophenol	U		0.014	0.30	mg/L	100	29-May-2019 22:37
Acenaphthene	**0.052**		**0.0082**	**0.030**	**mg/L**	100	29-May-2019 22:37
Acenaphthylene	U		0.0045	0.030	mg/L	100	29-May-2019 22:37
Anthracene	**0.032**		**0.0042**	**0.030**	**mg/L**	100	29-May-2019 22:37
Benz(a)anthracene	**0.048**		**0.015**	**0.030**	**mg/L**	100	29-May-2019 22:37
Benzidine	U		0.030	0.061	mg/L	100	29-May-2019 22:37
Benzo(a)pyrene	**0.041**		**0.0061**	**0.030**	**mg/L**	100	29-May-2019 22:37
Benzo(b)fluoranthene	**0.020**	J	**0.0070**	**0.030**	**mg/L**	100	29-May-2019 22:37
Benzo(g,h,i)perylene	U		0.0042	0.030	mg/L	100	29-May-2019 22:37
Benzo(k)fluoranthene	U		0.0058	0.030	mg/L	100	29-May-2019 22:37
Benzyl alcohol	U		0.016	0.061	mg/L	100	29-May-2019 22:37
Bis(2-chloroethoxy)methane	U		0.0091	0.061	mg/L	100	29-May-2019 22:37
Bis(2-chloroethyl)ether	U		0.0079	0.061	mg/L	100	29-May-2019 22:37
Bis(2-chloroisopropyl)ether	U		0.021	0.061	mg/L	100	29-May-2019 22:37
Bis(2-ethylhexyl)phthalate	**0.043**	J	**0.011**	**0.061**	**mg/L**	100	29-May-2019 22:37
Butyl benzyl phthalate	U		0.0058	0.061	mg/L	100	29-May-2019 22:37

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: WSW-1620-NCS_Water-20190524
Collection Date: 24-May-2019 14:30

ANALYTICAL REPORT
WorkOrder:HS19051571
Lab ID:HS19051571-02
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3510 / 28-May-2019		Analyst: GEY
Carbazole	**0.014**	J	**0.0076**	**0.061**	**mg/L**	100	29-May-2019 22:37
Chrysene	**0.095**		**0.0064**	**0.030**	**mg/L**	100	29-May-2019 22:37
Di-n-butyl phthalate	U		0.0061	0.061	mg/L	100	29-May-2019 22:37
Di-n-octyl phthalate	U		0.0061	0.061	mg/L	100	29-May-2019 22:37
Dibenz(a,h)anthracene	U		0.0073	0.030	mg/L	100	29-May-2019 22:37
Dibenzofuran	U		0.0061	0.030	mg/L	100	29-May-2019 22:37
Diethyl phthalate	U		0.0091	0.061	mg/L	100	29-May-2019 22:37
Dimethyl phthalate	U		0.012	0.061	mg/L	100	29-May-2019 22:37
Fluoranthene	**0.039**		**0.0030**	**0.030**	**mg/L**	100	29-May-2019 22:37
Fluorene	**0.076**		**0.0091**	**0.030**	**mg/L**	100	29-May-2019 22:37
Hexachlorobenzene	U		0.013	0.061	mg/L	100	29-May-2019 22:37
Hexachlorobutadiene	U		0.0091	0.061	mg/L	100	29-May-2019 22:37
Hexachlorocyclopentadiene	U		0.0091	0.061	mg/L	100	29-May-2019 22:37
Hexachloroethane	U		0.018	0.061	mg/L	100	29-May-2019 22:37
Indeno(1,2,3-cd)pyrene	U		0.0067	0.030	mg/L	100	29-May-2019 22:37
Isophorone	U		0.0076	0.061	mg/L	100	29-May-2019 22:37
N-Nitrosodi-n-propylamine	U		0.0097	0.061	mg/L	100	29-May-2019 22:37
N-Nitrosodimethylamine	U		0.030	0.061	mg/L	100	29-May-2019 22:37
N-Nitrosodiphenylamine	U		0.0076	0.061	mg/L	100	29-May-2019 22:37
Naphthalene	**1.4**		**0.0061**	**0.030**	**mg/L**	100	29-May-2019 22:37
Nitrobenzene	U		0.0073	0.061	mg/L	100	29-May-2019 22:37
Pentachlorophenol	U		0.024	0.061	mg/L	100	29-May-2019 22:37
Phenanthrene	**0.17**		**0.0064**	**0.030**	**mg/L**	100	29-May-2019 22:37
Phenol	U		0.011	0.061	mg/L	100	29-May-2019 22:37
Pyrene	**0.093**		**0.0058**	**0.030**	**mg/L**	100	29-May-2019 22:37
Pyridine	U		0.0091	0.30	mg/L	100	29-May-2019 22:37
Surr: 2,4,6-Tribromophenol	*0*	*JS*		*34-129*	*%REC*	*100*	*29-May-2019 22:37*
Surr: 2-Fluorobiphenyl	*0*	*JS*		*40-125*	*%REC*	*100*	*29-May-2019 22:37*
Surr: 2-Fluorophenol	*0*	*JS*		*20-120*	*%REC*	*100*	*29-May-2019 22:37*
Surr: 4-Terphenyl-d14	*0*	*JS*		*40-135*	*%REC*	*100*	*29-May-2019 22:37*
Surr: Nitrobenzene-d5	*0*	*JS*		*41-120*	*%REC*	*100*	*29-May-2019 22:37*
Surr: Phenol-d6	*0*	*JS*		*20-120*	*%REC*	*100*	*29-May-2019 22:37*
LOW-LEVEL TEXAS TPH BY TX1005		**Method:TX1005**			Prep:TX1005PR / 28-May-2019		Analyst: MBG
nC6 to nC12	**73**		**0.19**	**0.49**	**mg/L**	1	30-May-2019 12:13
>nC12 to nC28	**34**		**0.19**	**0.49**	**mg/L**	1	30-May-2019 12:13
>nC28 to nC35	**11**		**0.19**	**0.49**	**mg/L**	1	30-May-2019 12:13
Total Petroleum Hydrocarbon	**118**		**0.19**	**0.49**	**mg/L**	1	30-May-2019 12:13
Surr: 2-Fluorobiphenyl	*99.7*			*70-130*	*%REC*	*1*	*30-May-2019 12:13*
Surr: Trifluoromethyl benzene	*96.4*			*70-130*	*%REC*	*1*	*30-May-2019 12:13*

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: WSW-1620-NCS_Water-20190524
Collection Date: 24-May-2019 14:30

ANALYTICAL REPORT
WorkOrder:HS19051571
Lab ID:HS19051571-02
Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020**			Prep:SW3010A / 26-May-2019		Analyst: JHD
Antimony	**0.0206**		**0.00200**	**0.0100**	**mg/L**	5	29-May-2019 16:02
Arsenic	**0.0165**		**0.00200**	**0.0100**	**mg/L**	5	29-May-2019 16:02
Barium	**0.159**		**0.00950**	**0.0200**	**mg/L**	5	29-May-2019 16:02
Beryllium	U		0.00100	0.0100	mg/L	5	29-May-2019 16:02
Cadmium	U		0.00100	0.0100	mg/L	5	29-May-2019 16:02
Chromium	**0.0194**	J	**0.00200**	**0.0200**	**mg/L**	5	29-May-2019 16:02
Lead	**0.0856**		**0.00300**	**0.0100**	**mg/L**	5	29-May-2019 16:02
Nickel	**0.0444**		**0.00300**	**0.0100**	**mg/L**	5	29-May-2019 16:02
Selenium	U		0.00550	0.0100	mg/L	5	29-May-2019 16:02
Silver	U		0.00100	0.0100	mg/L	5	29-May-2019 16:02
Vanadium	**0.291**		**0.00300**	**0.0250**	**mg/L**	5	29-May-2019 16:02
MERCURY BY SW7470A		**Method:SW7470**			Prep:SW7470 / 28-May-2019		Analyst: FO
Mercury	**0.000257**		**0.0000300**	**0.000200**	**mg/L**	1	28-May-2019 13:56

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

WEIGHT LOG

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

Batch ID: 141236 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19051571-02	1	10	10 (mL)	1

Batch ID: 141252 **Method:** LOW-LEVEL SEMIVOLATILES BY 8270D **Prep:** 3510_B_LOW

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19051571-02	1	990	3 (mL)	0.00303

Batch ID: 141294 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19051571-02	1	10 (mL)	10 (mL)	1

Batch ID: 141304 **Method:** LOW-LEVEL TEXAS TPH BY TX1005 **Prep:** TX 1005_W PR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19051571-02	1	30.8	3 (mL)	0.0974

Batch ID: 141342 **Method:** TCLP METALS BY SW6020A **Prep:** 3010A_TCLP

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19051571-01	1	1	10 (mL)	10

Batch ID: 141427 **Method:** TCLP MERCURY BY SW7470A **Prep:** 1311_HGPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19051571-01	1	1 (mL)	10 (mL)	10

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 141236	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Water		
HS19051571-02	WSW-1620-NCS_Water-20190524	24 May 2019 14:30		26 May 2019 10:00	29 May 2019 16:02	5
Batch ID 141252	**Test Name :** LOW-LEVEL SEMIVOLATILES BY 8270D			**Matrix:** Water		
HS19051571-02	WSW-1620-NCS_Water-20190524	24 May 2019 14:30		28 May 2019 08:00	29 May 2019 22:37	100
Batch ID 141294	**Test Name :** MERCURY BY SW7470A			**Matrix:** Water		
HS19051571-02	WSW-1620-NCS_Water-20190524	24 May 2019 14:30		28 May 2019 09:30	28 May 2019 13:56	1
Batch ID 141304	**Test Name :** LOW-LEVEL TEXAS TPH BY TX1005			**Matrix:** Water		
HS19051571-02	WSW-1620-NCS_Water-20190524	24 May 2019 14:30		28 May 2019 13:30	30 May 2019 12:13	1
Batch ID 141342	**Test Name :** TCLP METALS BY SW6020A			**Matrix:** Oil		
HS19051571-01	NAPL-1620-NCS_Oil-20190524	24 May 2019 14:30	29 May 2019 15:00	29 May 2019 14:00	29 May 2019 18:47	10
Batch ID 141427	**Test Name :** TCLP MERCURY BY SW7470A			**Matrix:** Oil		
HS19051571-01	NAPL-1620-NCS_Oil-20190524	24 May 2019 14:30	29 May 2019 15:00	30 May 2019 10:00	30 May 2019 15:01	1
Batch ID R339261	**Test Name :** REACTIVE CYANIDE			**Matrix:** Oil		
HS19051571-01	NAPL-1620-NCS_Oil-20190524	24 May 2019 14:30			28 May 2019 12:00	1
Batch ID R339262	**Test Name :** REACTIVE SULFIDE			**Matrix:** Oil		
HS19051571-01	NAPL-1620-NCS_Oil-20190524	24 May 2019 14:30			28 May 2019 14:00	1
Batch ID R339317	**Test Name :** LOW LEVEL VOLATILES BY SW8260C			**Matrix:** Water		
HS19051571-02	WSW-1620-NCS_Water-20190524	24 May 2019 14:30			29 May 2019 07:34	100
Batch ID R339477	**Test Name :** PH SOIL BY SW9045D			**Matrix:** Oil		
HS19051571-01	NAPL-1620-NCS_Oil-20190524	24 May 2019 14:30			30 May 2019 13:30	1
Batch ID R339494	**Test Name :** FLASH POINT BY PENSKY-MARTENS SW1010A			**Matrix:** Oil		
HS19051571-01	NAPL-1620-NCS_Oil-20190524	24 May 2019 14:30			30 May 2019 13:50	1

WorkOrder: HS19051571
InstrumentID: FID-13
Test Code: TX1005_W_Low
Test Number: TX1005
Test Name: Low-level Texas TPH by TX1005

METHOD DETECTION / REPORTING LIMITS

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

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	nC6 to nC12	TPH-1005-1	0.25	0.23	0.20	0.50
A	>nC12 to nC28	TPH-1005-2	0.25	0.25	0.20	0.50
A	>nC28 to nC35	TPH-1005-4	0.25	0.23	0.20	0.50
A	Total Petroleum Hydrocarbon	TPH	0.25	0.23	0.20	0.50
S	2-Fluorobiphenyl	321-60-8	0	0	0	0
S	Trifluoromethyl benzene	98-08-8	0	0	0	0

WorkOrder: HS19051571
InstrumentID: HG03
Test Code: 1311_HG
Test Number: SW7470
Test Name: TCLP Mercury by SW7470A

METHOD DETECTION / REPORTING LIMITS

Matrix: Leachate **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Mercury	7439-97-6	0.000100	0.0000800	0.0000300	0.000200

WorkOrder: HS19051571
InstrumentID: ICPMS06
Test Code: 1311_METALS_HS
Test Number: SW1311/6020
Test Name: TCLP Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

Matrix: Leachate **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000461	0.000400	0.00500
A	Arsenic	7440-38-2	0.000500	0.000438	0.000400	0.00500
A	Barium	7440-39-3	0.00250	0.00262	0.00190	0.0200
A	Beryllium	7440-41-7	0.000500	0.000586	0.000200	0.00200
A	Cadmium	7440-43-9	0.000500	0.000484	0.000200	0.00500
A	Chromium	7440-47-3	0.000500	0.000273	0.000400	0.00500
A	Lead	7439-92-1	0.00100	0.000931	0.000600	0.00500
A	Nickel	7440-02-0	0.00100	0.00109	0.000600	0.00500
A	Selenium	7782-49-2	0.00250	0.00239	0.00110	0.00500
A	Silver	7440-22-4	0.000500	0.000432	0.000200	0.00500
A	Vanadium	7440-62-2	0.00100	0.00100	0.000600	0.00500

WorkOrder: HS19051571
InstrumentID: HG03
Test Code: HG_W
Test Number: SW7470
Test Name: Mercury by SW7470A

METHOD DETECTION / REPORTING LIMITS

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

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Mercury	7439-97-6	0.000100	0.0000800	0.0000300	0.000200

WorkOrder: HS19051571
InstrumentID: ICPMS06
Test Code: ICP_TW
Test Number: SW6020
Test Name: ICP-MS Metals by SW6020A

METHOD DETECTION / REPORTING LIMITS

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

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Antimony	7440-36-0	0.000500	0.000461	0.000400	0.00200
A	Arsenic	7440-38-2	0.000500	0.000438	0.000400	0.00200
A	Barium	7440-39-3	0.00250	0.00262	0.00190	0.00400
A	Beryllium	7440-41-7	0.000500	0.000586	0.000200	0.00200
A	Cadmium	7440-43-9	0.000500	0.000484	0.000200	0.00200
A	Chromium	7440-47-3	0.000500	0.000273	0.000400	0.00400
A	Lead	7439-92-1	0.00100	0.000931	0.000600	0.00200
A	Nickel	7440-02-0	0.00100	0.00109	0.000600	0.00200
A	Selenium	7782-49-2	0.00250	0.00239	0.00110	0.00200
A	Silver	7440-22-4	0.000500	0.000432	0.000200	0.00200
A	Vanadium	7440-62-2	0.00100	0.00100	0.000600	0.00500

WorkOrder: HS19051571
InstrumentID: SV-7
Test Code: 8270_LOW_W
Test Number: SW8270
Test Name: Low-Level Semivolatiles by 8270D

METHOD DETECTION / REPORTING LIMITS

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

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	1,2,4-Trichlorobenzene	120-82-1	0.00010	0.000076	0.000030	0.00020
A	2,4,5-Trichlorophenol	95-95-4	0.00010	0.000076	0.000057	0.00020
A	2,4,6-Trichlorophenol	88-06-2	0.00010	0.000065	0.000048	0.00020
A	2,4-Dichlorophenol	120-83-2	0.00010	0.000079	0.000043	0.00020
A	2,4-Dimethylphenol	105-67-9	0.00010	0.000058	0.000040	0.00020
A	2,4-Dinitrophenol	51-28-5	0.00010	0.00020	0.00010	0.0010
A	2,4-Dinitrotoluene	121-14-2	0.00010	0.000066	0.000058	0.00020
A	2,6-Dinitrotoluene	606-20-2	0.00010	0.000083	0.000042	0.00020
A	2-Chloronaphthalene	91-58-7	0.00010	0.000071	0.000021	0.00020
A	2-Chlorophenol	95-57-8	0.00010	0.000071	0.000036	0.00020
A	2-Methylnaphthalene	91-57-6	0.000050	0.000033	0.000019	0.00010
A	2-Methylphenol	95-48-7	0.00010	0.000078	0.000045	0.00020
A	2-Nitroaniline	88-74-4	0.00010	0.000093	0.000041	0.00020
A	2-Nitrophenol	88-75-5	0.00010	0.000072	0.000034	0.00020
A	3&4-Methylphenol	3/4-CRESOL	0.00010	0.000071	0.000036	0.00020
A	3,3´-Dichlorobenzidine	91-94-1	0.00010	0.00032	0.000044	0.00020
A	3-Nitroaniline	99-09-2	0.00010	0.000081	0.000049	0.00020
A	4,6-Dinitro-2-methylphenol	534-52-1	0.00010	0.000015	0.000020	0.00020
A	4-Bromophenyl phenyl ether	101-55-3	0.00010	0.000089	0.000051	0.00020
A	4-Chloro-3-methylphenol	59-50-7	0.00010	0.000082	0.000032	0.00020
A	4-Chloroaniline	106-47-8	0.00010	0.000073	0.000039	0.00020
A	4-Chlorophenyl phenyl ether	7005-72-3	0.00010	0.000070	0.000044	0.00020
A	4-Nitroaniline	100-01-6	0.00010	0.000099	0.000035	0.00020
A	4-Nitrophenol	100-02-7	0.00010	0.000066	0.000047	0.0010
A	Acenaphthene	83-32-9	0.000050	0.000044	0.000027	0.00010
A	Acenaphthylene	208-96-8	0.000050	0.000042	0.000015	0.00010
A	Anthracene	120-12-7	0.000050	0.000043	0.000014	0.00010
A	Benz(a)anthracene	56-55-3	0.000050	0.000044	0.000050	0.00010
A	Benzidine	92-87-5	0.00010	0.00011	0.00010	0.00020
A	Benzo(a)pyrene	50-32-8	0.000050	0.000036	0.000020	0.00010
A	Benzo(b)fluoranthene	205-99-2	0.000050	0.000037	0.000023	0.00010
A	Benzo(g,h,i)perylene	191-24-2	0.000050	0.000037	0.000014	0.00010
A	Benzo(k)fluoranthene	207-08-9	0.000050	0.000038	0.000019	0.00010
A	Benzyl alcohol	100-51-6	0.00010	0.000080	0.000054	0.00020
A	Bis(2-chloroethoxy)methane	111-91-1	0.00010	0.000070	0.000030	0.00020
A	Bis(2-chloroethyl)ether	111-44-4	0.00010	0.000070	0.000026	0.00020
A	Bis(2-chloroisopropyl)ether	108-60-1	0.00010	0.000084	0.000070	0.00020
A	Bis(2-ethylhexyl)phthalate	117-81-7	0.00010	0.000095	0.000037	0.00020
A	Butyl benzyl phthalate	85-68-7	0.00010	0.000094	0.000019	0.00020
A	Carbazole	86-74-8	0.00010	0.000088	0.000025	0.00020

WorkOrder: HS19051571
InstrumentID: SV-7
Test Code: 8270_LOW_W
Test Number: SW8270
Test Name: Low-Level Semivolatiles by 8270D

METHOD DETECTION / REPORTING LIMITS

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

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Chrysene	218-01-9	0.000050	0.000041	0.000021	0.00010
A	Di-n-butyl phthalate	84-74-2	0.00010	0.000084	0.000020	0.00020
A	Di-n-octyl phthalate	117-84-0	0.00010	0.000091	0.000020	0.00020
A	Dibenz(a,h)anthracene	53-70-3	0.000050	0.000034	0.000024	0.00010
A	Dibenzofuran	132-64-9	0.000050	0.000035	0.000020	0.00010
A	Diethyl phthalate	84-66-2	0.00010	0.000085	0.000030	0.00020
A	Dimethyl phthalate	131-11-3	0.00010	0.000077	0.000041	0.00020
A	Fluoranthene	206-44-0	0.000050	0.000041	0.000010	0.00010
A	Fluorene	86-73-7	0.000050	0.000042	0.000030	0.00010
A	Hexachlorobenzene	118-74-1	0.00010	0.000073	0.000044	0.00020
A	Hexachlorobutadiene	87-68-3	0.00010	0.000071	0.000030	0.00020
A	Hexachlorocyclopentadiene	77-47-4	0.00010	0.000063	0.000030	0.00020
A	Hexachloroethane	67-72-1	0.00010	0.000079	0.000059	0.00020
A	Indeno(1,2,3-cd)pyrene	193-39-5	0.000050	0.000041	0.000022	0.00010
A	Isophorone	78-59-1	0.00010	0.000078	0.000025	0.00020
A	N-Nitrosodi-n-propylamine	621-64-7	0.00010	0.000078	0.000032	0.00020
A	N-Nitrosodimethylamine	62-75-9	0.0010	0.000075	0.00010	0.00020
A	N-Nitrosodiphenylamine	86-30-6	0.00010	0.000072	0.000025	0.00020
A	Naphthalene	91-20-3	0.000050	0.000045	0.000020	0.00010
A	Nitrobenzene	98-95-3	0.00010	0.00010	0.000024	0.00020
A	Pentachlorophenol	87-86-5	0.00040	0.00024	0.000079	0.00020
A	Phenanthrene	85-01-8	0.000050	0.000045	0.000021	0.00010
A	Phenol	108-95-2	0.00010	0.000085	0.000035	0.00020
A	Pyrene	129-00-0	0.000050	0.000044	0.000019	0.00010
A	Pyridine	110-86-1	0.00010	0.000071	0.000030	0.0010
S	2,4,6-Tribromophenol	118-79-6	0	0	0	0.00020
S	2-Fluorobiphenyl	321-60-8	0	0	0	0.00020
S	2-Fluorophenol	367-12-4	0	0	0	0.00020
S	4-Terphenyl-d14	1718-51-0	0	0	0	0.00020
S	Nitrobenzene-d5	4165-60-0	0	0	0	0.00020
S	Phenol-d6	13127-88-3	0	0	0	0.00020

WorkOrder: HS19051571
InstrumentID: VOA2
Test Code: 8260_LL_W
Test Number: SW8260
Test Name: Low Level Volatiles by SW8260C

METHOD DETECTION / REPORTING LIMITS

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

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	1,1,1-Trichloroethane	71-55-6	0.00050	0.00048	0.00020	0.0010
A	1,1,2,2-Tetrachloroethane	79-34-5	0.00050	0.00056	0.00050	0.0010
A	1,1,2-Trichloroethane	79-00-5	0.00050	0.00054	0.00030	0.0010
A	1,1-Dichloroethane	75-34-3	0.00050	0.00056	0.00020	0.0010
A	1,1-Dichloroethene	75-35-4	0.00050	0.00050	0.00020	0.0010
A	1,2-Dichlorobenzene	95-50-1	0.00050	0.00060	0.00050	0.0010
A	1,2-Dichloroethane	107-06-2	0.00050	0.00065	0.00020	0.0010
A	1,2-Dichloropropane	78-87-5	0.00050	0.00061	0.00050	0.0010
A	1,3-Dichlorobenzene	541-73-1	0.00050	0.00060	0.00040	0.0010
A	1,4-Dichlorobenzene	106-46-7	0.00050	0.00058	0.00040	0.0010
A	2-Butanone	78-93-3	0.0010	0.0012	0.00050	0.0020
A	2-Hexanone	591-78-6	0.0010	0.0013	0.0010	0.0020
A	4-Methyl-2-pentanone	108-10-1	0.0010	0.0012	0.00070	0.0020
A	Acetone	67-64-1	0.0020	0.0024	0.0020	0.0020
A	Benzene	71-43-2	0.00050	0.00059	0.00020	0.0010
A	Bromochloromethane	74-97-5	0.00050	0.00050	0.00020	0.0010
A	Bromodichloromethane	75-27-4	0.00050	0.00054	0.00020	0.0010
A	Bromoform	75-25-2	0.0050	0.00052	0.00040	0.0010
A	Bromomethane	74-83-9	0.00050	0.00076	0.00040	0.0010
A	Carbon disulfide	75-15-0	0.0010	0.0011	0.00060	0.0020
A	Carbon tetrachloride	56-23-5	0.00050	0.00059	0.00050	0.0010
A	Chlorobenzene	108-90-7	0.00050	0.00060	0.00030	0.0010
A	Chloroethane	75-00-3	0.00050	0.00058	0.00030	0.0010
A	Chloroform	67-66-3	0.00050	0.00054	0.00020	0.0010
A	Chloromethane	74-87-3	0.00050	0.00065	0.00020	0.0010
A	cis-1,2-Dichloroethene	156-59-2	0.00050	0.00055	0.00020	0.0010
A	cis-1,3-Dichloropropene	10061-01-5	0.00050	0.00053	0.00010	0.0010
A	Dibromochloromethane	124-48-1	0.00050	0.00051	0.00030	0.0010
A	Ethylbenzene	100-41-4	0.00050	0.00062	0.00030	0.0010
A	m,p-Xylene	179601-23-1	0.0010	0.0016	0.00050	0.0020
A	Methylene chloride	75-09-2	0.00050	0.00067	0.0010	0.0020
A	o-Xylene	95-47-6	0.00050	0.00076	0.00030	0.0010
A	Styrene	100-42-5	0.00050	0.00056	0.00030	0.0010
A	Tetrachloroethene	127-18-4	0.00050	0.00058	0.00030	0.0010
A	Toluene	108-88-3	0.00050	0.00066	0.00020	0.0010
A	trans-1,2-Dichloroethene	156-60-5	0.00050	0.00048	0.00020	0.0010
A	trans-1,3-Dichloropropene	10061-02-6	0.00050	0.00049	0.00020	0.0010
A	Trichloroethene	79-01-6	0.00050	0.00056	0.00020	0.0010
A	Vinyl acetate	108-05-4	0.00050	0.0011	0.00050	0.0010
A	Vinyl chloride	75-01-4	0.00050	0.00051	0.00020	0.0010

WorkOrder: HS19051571
InstrumentID: VOA2
Test Code: 8260_LL_W
Test Number: SW8260
Test Name: Low Level Volatiles by SW8260C

METHOD DETECTION / REPORTING LIMITS

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

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Xylenes, Total	1330-20-7	0.00050	0.00076	0.00030	0.0010
A	1,2-Dichloroethene, Total	540-59-0	0.00050	0.00048	0.00020	0.0010
S	1,2-Dichloroethane-d4	17060-07-0	0	0	0	0.0010
S	4-Bromofluorobenzene	460-00-4	0	0	0	0.0010
S	Dibromofluoromethane	1868-53-7	0	0	0	0.0010
S	Toluene-d8	2037-26-5	0	0	0	0.0010

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: 141304 (0) **Instrument: FID-13** **Method: LOW-LEVEL TEXAS TPH BY TX1005**

MBLK Sample ID: **MBLK-141304** Units: **mg/L** Analysis Date: **29-May-2019 17:21**
Client ID: Run ID: **FID-13_339424** SeqNo: **5098043** PrepDate: **28-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	U	0.50								
>nC12 to nC28	U	0.50								
>nC28 to nC35	U	0.50								
Total Petroleum Hydrocarbon	U	0.50								
Surr: 2-Fluorobiphenyl	*2.059*	*0*	*2.5*	*0*	*82.3*	*70 - 130*				
Surr: Trifluoromethyl benzene	*2.365*	*0*	*2.5*	*0*	*94.6*	*70 - 130*				

LCS Sample ID: **LCS-141304** Units: **mg/L** Analysis Date: **29-May-2019 17:50**
Client ID: Run ID: **FID-13_339424** SeqNo: **5098044** PrepDate: **28-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	26.89	0.50	25	0	108	75 - 125				
>nC12 to nC28	27.52	0.50	25	0	110	75 - 125				
Surr: 2-Fluorobiphenyl	*2.446*	*0*	*2.5*	*0*	*97.9*	*70 - 130*				
Surr: Trifluoromethyl benzene	*2.462*	*0*	*2.5*	*0*	*98.5*	*70 - 130*				

LCSD Sample ID: **LCSD-141304** Units: **mg/L** Analysis Date: **29-May-2019 18:18**
Client ID: Run ID: **FID-13_339424** SeqNo: **5098045** PrepDate: **28-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	29.07	0.50	25	0	116	75 - 125	26.89	7.77	20	
>nC12 to nC28	30.29	0.50	25	0	121	75 - 125	27.52	9.56	20	
Surr: 2-Fluorobiphenyl	*2.572*	*0*	*2.5*	*0*	*103*	*70 - 130*	*2.446*	*4.99*	*20*	
Surr: Trifluoromethyl benzene	*2.561*	*0*	*2.5*	*0*	*102*	*70 - 130*	*2.462*	*3.94*	*20*	

MS Sample ID: **HS19051516-01MS** Units: **mg/L** Analysis Date: **29-May-2019 19:16**
Client ID: Run ID: **FID-13_339424** SeqNo: **5098047** PrepDate: **28-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	32.57	0.48	23.95	11.66	87.3	75 - 125				
>nC12 to nC28	28.44	0.48	23.95	2.161	110	75 - 125				
Surr: 2-Fluorobiphenyl	*2.389*	*0*	*2.395*	*0*	*99.7*	*70 - 130*				
Surr: Trifluoromethyl benzene	*2.452*	*0*	*2.395*	*0*	*102*	*70 - 130*				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: 141304 (0) **Instrument: FID-13** **Method: LOW-LEVEL TEXAS TPH BY TX1005**

MSD Sample ID: **HS19051516-01MSD** Units: **mg/L** Analysis Date: **29-May-2019 19:45**
Client ID: Run ID: **FID-13_339424** SeqNo: **5098048** PrepDate: **28-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	35.81	0.48	24.06	11.66	100	75 - 125	32.57	9.47	20	
>nC12 to nC28	30.86	0.48	24.06	2.161	119	75 - 125	28.44	8.14	20	
Surr: 2-Fluorobiphenyl	*2.415*	*0*	*2.406*	*0*	*100*	*70 - 130*	*2.389*	*1.07*	*20*	
Surr: Trifluoromethyl benzene	*2.409*	*0*	*2.406*	*0*	*100*	*70 - 130*	*2.452*	*1.76*	*20*	

The following samples were analyzed in this batch: HS19051571-02

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: 141236 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-141236** Units: **mg/L** Analysis Date: **29-May-2019 13:42**
Client ID: Run ID: **ICPMS06_339340** SeqNo: **5097008** PrepDate: **26-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00200								
Arsenic	U	0.00200								
Barium	U	0.00400								
Beryllium	U	0.00200								
Cadmium	U	0.00200								
Chromium	U	0.00400								
Lead	U	0.00200								
Nickel	U	0.00200								
Selenium	U	0.00200								
Silver	U	0.00200								
Vanadium	U	0.00500								

LCS Sample ID: **LCS-141236** Units: **mg/L** Analysis Date: **29-May-2019 13:43**
Client ID: Run ID: **ICPMS06_339340** SeqNo: **5097009** PrepDate: **26-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05008	0.00200	0.05	0	100	80 - 120				
Arsenic	0.05029	0.00200	0.05	0	101	80 - 120				
Barium	0.04922	0.00400	0.05	0	98.4	80 - 120				
Beryllium	0.04772	0.00200	0.05	0	95.4	80 - 120				
Cadmium	0.05021	0.00200	0.05	0	100	80 - 120				
Chromium	0.04692	0.00400	0.05	0	93.8	80 - 120				
Lead	0.04821	0.00200	0.05	0	96.4	80 - 120				
Nickel	0.04836	0.00200	0.05	0	96.7	80 - 120				
Selenium	0.05341	0.00200	0.05	0	107	80 - 120				
Silver	0.04911	0.00200	0.05	0	98.2	80 - 120				
Vanadium	0.04737	0.00500	0.05	0	94.7	80 - 120				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: 141236 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MS Sample ID: **HS19051415-01MS** Units: **mg/L** Analysis Date: **29-May-2019 13:50**
Client ID: Run ID: **ICPMS06_339340** SeqNo: **5097013** PrepDate: **26-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05115	0.00200	0.05	0.000303	102	80 - 120				
Arsenic	0.05324	0.00200	0.05	0.002665	101	80 - 120				
Barium	0.2158	0.00400	0.05	0.167	97.6	80 - 120				
Beryllium	0.04881	0.00200	0.05	0.000046	97.5	80 - 120				
Cadmium	0.05061	0.00200	0.05	0.000031	101	80 - 120				
Chromium	0.04824	0.00400	0.05	-0.000022	96.5	80 - 120				
Lead	0.04907	0.00200	0.05	0.000021	98.1	80 - 120				
Nickel	0.04913	0.00200	0.05	0.001689	94.9	80 - 120				
Selenium	0.05145	0.00200	0.05	0.000399	102	80 - 120				
Silver	0.04792	0.00200	0.05	0.000002	95.8	80 - 120				
Vanadium	0.05387	0.00500	0.05	0.00478	98.2	80 - 120				

MSD Sample ID: **HS19051415-01MSD** Units: **mg/L** Analysis Date: **29-May-2019 13:52**
Client ID: Run ID: **ICPMS06_339340** SeqNo: **5097014** PrepDate: **26-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0494	0.00200	0.05	0.000303	98.2	80 - 120	0.05115	3.49	20	
Arsenic	0.05187	0.00200	0.05	0.002665	98.4	80 - 120	0.05324	2.61	20	
Barium	0.2063	0.00400	0.05	0.167	78.7	80 - 120	0.2158	4.48	20	S
Beryllium	0.04685	0.00200	0.05	0.000046	93.6	80 - 120	0.04881	4.11	20	
Cadmium	0.04872	0.00200	0.05	0.000031	97.4	80 - 120	0.05061	3.81	20	
Chromium	0.04625	0.00400	0.05	-0.000022	92.6	80 - 120	0.04824	4.22	20	
Lead	0.04698	0.00200	0.05	0.000021	93.9	80 - 120	0.04907	4.35	20	
Nickel	0.04665	0.00200	0.05	0.001689	89.9	80 - 120	0.04913	5.19	20	
Selenium	0.04881	0.00200	0.05	0.000399	96.8	80 - 120	0.05145	5.26	20	
Silver	0.04596	0.00200	0.05	0.000002	91.9	80 - 120	0.04792	4.18	20	
Vanadium	0.05148	0.00500	0.05	0.00478	93.4	80 - 120	0.05387	4.53	20	

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: 141236 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

PDS Sample ID: **HS19051415-01PDS** Units: **mg/L** Analysis Date: **29-May-2019 13:54**
Client ID: Run ID: **ICPMS06_339340** SeqNo: **5097015** PrepDate: **26-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09532	0.00200	0.1	0	95.3	75 - 125				
Arsenic	0.1002	0.00200	0.1	0.002665	97.5	75 - 125				
Barium	0.2475	0.00400	0.1	0.167	80.5	75 - 125				
Beryllium	0.09894	0.00200	0.1	0	98.9	75 - 125				
Cadmium	0.09594	0.00200	0.1	0	95.9	75 - 125				
Chromium	0.09076	0.00400	0.1	0	90.8	75 - 125				
Lead	0.0937	0.00200	0.1	0	93.7	75 - 125				
Nickel	0.09083	0.00200	0.1	0.001689	89.1	75 - 125				
Selenium	0.1021	0.00200	0.1	0	102	75 - 125				
Silver	0.09022	0.00200	0.1	0	90.2	75 - 125				
Vanadium	0.0971	0.00500	0.1	0.00478	92.3	75 - 125				

SD Sample ID: **HS19051415-01SD** Units: **mg/L** Analysis Date: **29-May-2019 13:49**
Client ID: Run ID: **ICPMS06_339340** SeqNo: **5097012** PrepDate: **26-May-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.0100					0.000303	0	10	
Arsenic	0.002786	0.0100					0.002665	0	10	J
Barium	0.1674	0.0200					0.167	0.22	10	
Beryllium	U	0.0100					0.000046	0	10	
Cadmium	U	0.0100					0.000031	0	10	
Chromium	U	0.0200					-0.000022	0	10	
Lead	U	0.0100					0.000021	0	10	
Nickel	U	0.0100					0.001689	0	10	
Selenium	U	0.0100					0.000399	0	10	
Silver	U	0.0100					0.000002	0	10	
Vanadium	0.004173	0.0250					0.00478	0	10	J

The following samples were analyzed in this batch: HS19051571-02

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: 141294 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-141294** Units: **mg/L** Analysis Date: **28-May-2019 13:25**
Client ID: Run ID: **HG03_339267** SeqNo: **5094245** PrepDate: **28-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	U	0.000200								

LCS Sample ID: **LCS-141294** Units: **mg/L** Analysis Date: **28-May-2019 13:26**
Client ID: Run ID: **HG03_339267** SeqNo: **5094246** PrepDate: **28-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00501	0.000200	0.005	0	100	80 - 120				

MS Sample ID: **HS19051566-05MS** Units: **mg/L** Analysis Date: **28-May-2019 13:33**
Client ID: Run ID: **HG03_339267** SeqNo: **5094248** PrepDate: **28-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00507	0.000200	0.005	-0.000004	101	75 - 125				

MSD Sample ID: **HS19051566-05MSD** Units: **mg/L** Analysis Date: **28-May-2019 13:34**
Client ID: Run ID: **HG03_339267** SeqNo: **5094249** PrepDate: **28-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00518	0.000200	0.005	-0.000004	104	75 - 125	0.00507	2.15	20	

The following samples were analyzed in this batch: HS19051571-02

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: 141342 (0) **Instrument: ICPMS06** **Method: TCLP METALS BY SW6020A**

MBLK Sample ID: **MBLKT2-141342** Units: **mg/L** Analysis Date: **29-May-2019 18:06**
Client ID: Run ID: **ICPMS06_339340** SeqNo: **5097641** PrepDate: **29-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.0500								
Arsenic	U	0.0500								
Barium	U	0.200								
Beryllium	U	0.0200								
Cadmium	U	0.0500								
Chromium	U	0.0500								
Lead	U	0.0500								
Nickel	U	0.0500								
Selenium	U	0.0500								
Silver	U	0.0500								
Vanadium	U	0.0500								

MBLK Sample ID: **MBLKT4-141342** Units: **mg/L** Analysis Date: **29-May-2019 18:09**
Client ID: Run ID: **ICPMS06_339340** SeqNo: **5097643** PrepDate: **29-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.0500								
Arsenic	U	0.0500								
Barium	U	0.200								
Beryllium	U	0.0200								
Cadmium	U	0.0500								
Chromium	U	0.0500								
Lead	U	0.0500								
Nickel	0.02945	0.0500								J
Selenium	U	0.0500								
Silver	U	0.0500								
Vanadium	U	0.0500								

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: 141342 (0) **Instrument: ICPMS06** **Method: TCLP METALS BY SW6020A**

MBLK Sample ID: **MBLKT3-141342** Units: **mg/L** Analysis Date: **29-May-2019 18:07**
Client ID: Run ID: **ICPMS06_339340** SeqNo: **5097642** PrepDate: **29-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.0500								
Arsenic	U	0.0500								
Barium	U	0.200								
Beryllium	U	0.0200								
Cadmium	U	0.0500								
Chromium	U	0.0500								
Lead	U	0.0500								
Nickel	0.0283	0.0500								J
Selenium	U	0.0500								
Silver	U	0.0500								
Vanadium	U	0.0500								

MBLK Sample ID: **MBLKT1-141342** Units: **mg/L** Analysis Date: **29-May-2019 18:04**
Client ID: Run ID: **ICPMS06_339340** SeqNo: **5097640** PrepDate: **29-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.0500								
Arsenic	U	0.0500								
Barium	U	0.200								
Beryllium	U	0.0200								
Cadmium	U	0.0500								
Chromium	U	0.0500								
Lead	U	0.0500								
Nickel	0.0268	0.0500								J
Selenium	U	0.0500								
Silver	U	0.0500								
Vanadium	U	0.0500								

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: 141342 (0) **Instrument: ICPMS06** **Method: TCLP METALS BY SW6020A**

MBLK Sample ID: **MBLK-141342** Units: **mg/L** Analysis Date: **29-May-2019 18:02**
Client ID: Run ID: **ICPMS06_339340** SeqNo: **5097639** PrepDate: **29-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.00500								
Arsenic	U	0.00500								
Barium	U	0.0200								
Beryllium	U	0.00200								
Cadmium	U	0.00500								
Chromium	U	0.00500								
Lead	U	0.00500								
Nickel	U	0.00500								
Selenium	U	0.00500								
Silver	U	0.00500								
Vanadium	U	0.00500								

LCS Sample ID: **LCS-141342** Units: **mg/L** Analysis Date: **29-May-2019 18:11**
Client ID: Run ID: **ICPMS06_339340** SeqNo: **5097644** PrepDate: **29-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05179	0.00500	0.05	0	104	80 - 120				
Arsenic	0.0524	0.00500	0.05	0	105	80 - 120				
Barium	0.04962	0.0200	0.05	0	99.2	80 - 120				
Beryllium	0.05059	0.00200	0.05	0	101	80 - 120				
Cadmium	0.0534	0.00500	0.05	0	107	80 - 120				
Chromium	0.05002	0.00500	0.05	0	100	80 - 120				
Lead	0.04986	0.00500	0.05	0	99.7	80 - 120				
Nickel	0.05163	0.00500	0.05	0	103	80 - 120				
Selenium	0.0551	0.00500	0.05	0	110	80 - 120				
Silver	0.05027	0.00500	0.05	0	101	80 - 120				
Vanadium	0.04973	0.00500	0.05	0	99.5	80 - 120				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: 141342 (0) **Instrument: ICPMS06** **Method: TCLP METALS BY SW6020A**

MS Sample ID: **HS19051385-01MS** Units: **mg/L** Analysis Date: **29-May-2019 18:22**
Client ID: Run ID: **ICPMS06_339340** SeqNo: **5097650** PrepDate: **29-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.5214	0.0500	0.5	0.00574	103	80 - 120				
Arsenic	0.5431	0.0500	0.5	0.0068	107	80 - 120				
Barium	1.874	0.200	0.5	1.447	85.5	80 - 120				
Beryllium	0.5104	0.0200	0.5	0.00005	102	80 - 120				
Cadmium	0.5092	0.0500	0.5	0.00022	102	80 - 120				
Chromium	0.5039	0.0500	0.5	-0.00249	101	80 - 120				
Lead	0.5128	0.0500	0.5	0.00145	102	80 - 120				
Nickel	0.5238	0.0500	0.5	0.029	99.0	80 - 120				
Selenium	0.5496	0.0500	0.5	-0.00408	111	80 - 120				
Silver	0.4722	0.0500	0.5	-0.00004	94.4	80 - 120				
Vanadium	0.5095	0.0500	0.5	-0.00186	102	80 - 120				

MSD Sample ID: **HS19051385-01MSD** Units: **mg/L** Analysis Date: **29-May-2019 18:24**
Client ID: Run ID: **ICPMS06_339340** SeqNo: **5097651** PrepDate: **29-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.5152	0.0500	0.5	0.00574	102	80 - 120	0.5214	1.2	20	
Arsenic	0.5342	0.0500	0.5	0.0068	105	80 - 120	0.5431	1.64	20	
Barium	1.887	0.200	0.5	1.447	88.0	80 - 120	1.874	0.66	20	
Beryllium	0.5058	0.0200	0.5	0.00005	101	80 - 120	0.5104	0.909	20	
Cadmium	0.519	0.0500	0.5	0.00022	104	80 - 120	0.5092	1.91	20	
Chromium	0.4976	0.0500	0.5	-0.00249	100	80 - 120	0.5039	1.26	20	
Lead	0.5117	0.0500	0.5	0.00145	102	80 - 120	0.5128	0.201	20	
Nickel	0.5226	0.0500	0.5	0.029	98.7	80 - 120	0.5238	0.233	20	
Selenium	0.5429	0.0500	0.5	-0.00408	109	80 - 120	0.5496	1.23	20	
Silver	0.4774	0.0500	0.5	-0.00004	95.5	80 - 120	0.4722	1.09	20	
Vanadium	0.5107	0.0500	0.5	-0.00186	103	80 - 120	0.5095	0.243	20	

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: 141342 (0) **Instrument: ICPMS06** **Method: TCLP METALS BY SW6020A**

PDS Sample ID: **HS19051385-01PDS** Units: **mg/L** Analysis Date: **29-May-2019 18:26**
Client ID: Run ID: **ICPMS06_339340** SeqNo: **5097652** PrepDate: **29-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.9345	0.0500	1	0.00574	92.9	75 - 125				
Arsenic	0.9921	0.0500	1	0.0068	98.5	75 - 125				
Barium	2.26	0.200	1	1.447	81.3	75 - 125				
Beryllium	1.015	0.0200	1	0.00005	101	75 - 125				
Cadmium	0.962	0.0500	1	0.00022	96.2	75 - 125				
Chromium	0.9367	0.0500	1	-0.00249	93.9	75 - 125				
Lead	0.9521	0.0500	1	0.00145	95.1	75 - 125				
Nickel	0.9561	0.0500	1	0.029	92.7	75 - 125				
Selenium	1.015	0.0500	1	-0.00408	102	75 - 125				
Silver	0.8533	0.0500	1	-0.00004	85.3	75 - 125				
Vanadium	0.9483	0.0500	1	-0.00186	95.0	75 - 125				

SD Sample ID: **HS19051385-01SD** Units: **mg/L** Analysis Date: **29-May-2019 18:20**
Client ID: Run ID: **ICPMS06_339340** SeqNo: **5097649** PrepDate: **29-May-2019** DF: **5**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	U	0.250					0.00574	0	10	
Arsenic	U	0.250					0.0068	0	10	
Beryllium	U	0.100					0.00005	0	10	
Cadmium	U	0.250					0.00022	0	10	
Chromium	U	0.250					-0.00249	0	10	
Lead	U	0.250					0.00145	0	10	
Nickel	U	0.250					0.029	0	10	
Selenium	U	0.250					-0.00408	0	10	
Silver	U	0.250					-0.00004	0	10	
Vanadium	U	0.250					-0.00186	0	10	

The following samples were analyzed in this batch: HS19051571-01

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: 141427 (0) **Instrument: HG03** **Method: TCLP MERCURY BY SW7470A**

MBLK Sample ID: **MBLKT1-141427** Units: **mg/L** Analysis Date: **30-May-2019 14:25**
Client ID: Run ID: **HG03_339493** SeqNo: **5099053** PrepDate: **30-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	U	0.000200								

MBLK Sample ID: **MBLK-141427** Units: **mg/L** Analysis Date: **30-May-2019 14:17**
Client ID: Run ID: **HG03_339493** SeqNo: **5099048** PrepDate: **30-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	U	0.000200								

LCS Sample ID: **LCS-141427** Units: **mg/L** Analysis Date: **30-May-2019 14:19**
Client ID: Run ID: **HG03_339493** SeqNo: **5099049** PrepDate: **30-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.005	0.000200	0.005	0	100	80 - 120				

MS Sample ID: **HS19051686-01MS** Units: **mg/L** Analysis Date: **30-May-2019 14:22**
Client ID: Run ID: **HG03_339493** SeqNo: **5099051** PrepDate: **30-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00496	0.000200	0.005	-0.000009	99.4	75 - 125				

MSD Sample ID: **HS19051686-01MSD** Units: **mg/L** Analysis Date: **30-May-2019 14:24**
Client ID: Run ID: **HG03_339493** SeqNo: **5099052** PrepDate: **30-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00497	0.000200	0.005	-0.000009	99.6	75 - 125	0.00496	0.201	20	

The following samples were analyzed in this batch: HS19051571-01

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: 141252 (0) **Instrument: SV-7** **Method: LOW-LEVEL SEMIVOLATILES BY 8270D**

MBLK Sample ID: **MBLK-141252** Units: **ug/L** Analysis Date: **29-May-2019 14:07**
Client ID: Run ID: **SV-7_339392** SeqNo: **5097139** PrepDate: **28-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trichlorobenzene	U	0.20								
2,4,5-Trichlorophenol	U	0.20								
2,4,6-Trichlorophenol	U	0.20								
2,4-Dichlorophenol	U	0.20								
2,4-Dimethylphenol	U	0.20								
2,4-Dinitrophenol	U	1.0								
2,4-Dinitrotoluene	U	0.20								
2,6-Dinitrotoluene	U	0.20								
2-Chloronaphthalene	U	0.20								
2-Chlorophenol	U	0.20								
2-Methylnaphthalene	U	0.10								
2-Methylphenol	U	0.20								
2-Nitroaniline	U	0.20								
2-Nitrophenol	U	0.20								
3&4-Methylphenol	U	0.20								
3,3´-Dichlorobenzidine	U	0.20								
3-Nitroaniline	U	0.20								
4,6-Dinitro-2-methylphenol	U	0.20								
4-Bromophenyl phenyl ether	U	0.20								
4-Chloro-3-methylphenol	U	0.20								
4-Chloroaniline	U	0.20								
4-Chlorophenyl phenyl ether	U	0.20								
4-Nitroaniline	U	0.20								
4-Nitrophenol	U	1.0								
Acenaphthene	U	0.10								
Acenaphthylene	U	0.10								
Anthracene	U	0.10								
Benz(a)anthracene	U	0.10								
Benzidine	U	0.20								
Benzo(a)pyrene	U	0.10								
Benzo(b)fluoranthene	U	0.10								
Benzo(g,h,i)perylene	U	0.10								
Benzo(k)fluoranthene	U	0.10								
Benzyl alcohol	U	0.20								

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: 141252 (0) **Instrument: SV-7** **Method: LOW-LEVEL SEMIVOLATILES BY 8270D**

MBLK Sample ID: **MBLK-141252** Units: **ug/L** Analysis Date: **29-May-2019 14:07**
Client ID: Run ID: **SV-7_339392** SeqNo: **5097139** PrepDate: **28-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bis(2-chloroethoxy)methane	U	0.20								
Bis(2-chloroethyl)ether	U	0.20								
Bis(2-chloroisopropyl)ether	U	0.20								
Bis(2-ethylhexyl)phthalate	U	0.20								
Butyl benzyl phthalate	U	0.20								
Carbazole	U	0.20								
Chrysene	U	0.10								
Dibenz(a,h)anthracene	U	0.10								
Dibenzofuran	U	0.10								
Diethyl phthalate	U	0.20								
Dimethyl phthalate	U	0.20								
Di-n-butyl phthalate	U	0.20								
Di-n-octyl phthalate	U	0.20								
Fluoranthene	U	0.10								
Fluorene	U	0.10								
Hexachlorobenzene	U	0.20								
Hexachlorobutadiene	U	0.20								
Hexachlorocyclopentadiene	U	0.20								
Hexachloroethane	U	0.20								
Indeno(1,2,3-cd)pyrene	U	0.10								
Isophorone	U	0.20								
Naphthalene	U	0.10								
Nitrobenzene	U	0.20								
N-Nitrosodimethylamine	U	0.20								
N-Nitrosodi-n-propylamine	U	0.20								
N-Nitrosodiphenylamine	U	0.20								
Pentachlorophenol	U	0.20								
Phenanthrene	U	0.10								
Phenol	U	0.20								
Pyrene	U	0.10								
Pyridine	U	1.0								
Surr: 2,4,6-Tribromophenol	*4.053*	*0.20*	*5*	*0*	*81.1*	*34 - 129*				
Surr: 2-Fluorobiphenyl	*5.392*	*0.20*	*5*	*0*	*108*	*40 - 125*				
Surr: 2-Fluorophenol	*4.373*	*0.20*	*5*	*0*	*87.5*	*20 - 120*				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: 141252 (0) **Instrument: SV-7** **Method: LOW-LEVEL SEMIVOLATILES BY 8270D**

MBLK Sample ID: **MBLK-141252** Units: **ug/L** Analysis Date: **29-May-2019 14:07**
Client ID: Run ID: **SV-7_339392** SeqNo: **5097139** PrepDate: **28-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: 4-Terphenyl-d14	*5.46*	*0.20*	*5*	*0*	*109*	*40 - 135*				
Surr: Nitrobenzene-d5	*4.573*	*0.20*	*5*	*0*	*91.5*	*41 - 120*				
Surr: Phenol-d6	*5.109*	*0.20*	*5*	*0*	*102*	*20 - 120*				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: 141252 (0) **Instrument: SV-7** **Method: LOW-LEVEL SEMIVOLATILES BY 8270D**

LCS Sample ID: **LCS-141252** Units: **ug/L** Analysis Date: **29-May-2019 15:06**
Client ID: Run ID: **SV-7_339392** SeqNo: **5097142** PrepDate: **28-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trichlorobenzene	5.177	0.20	5	0	104	45 - 120				
2,4,5-Trichlorophenol	5.318	0.20	5	0	106	46 - 120				
2,4,6-Trichlorophenol	5.279	0.20	5	0	106	42 - 120				
2,4-Dichlorophenol	5.291	0.20	5	0	106	49 - 120				
2,4-Dimethylphenol	5.142	0.20	5	0	103	35 - 120				
2,4-Dinitrophenol	4.508	1.0	5	0	90.2	15 - 120				
2,4-Dinitrotoluene	5.266	0.20	5	0	105	50 - 122				
2,6-Dinitrotoluene	5.574	0.20	5	0	111	50 - 120				
2-Chloronaphthalene	5.357	0.20	5	0	107	50 - 120				
2-Chlorophenol	5.224	0.20	5	0	104	40 - 120				
2-Methylnaphthalene	5.312	0.10	5	0	106	50 - 120				
2-Methylphenol	5.264	0.20	5	0	105	45 - 120				
2-Nitroaniline	5.011	0.20	5	0	100	28 - 139				
2-Nitrophenol	5.16	0.20	5	0	103	40 - 120				
3&4-Methylphenol	5.116	0.20	5	0	102	35 - 120				
3,3´-Dichlorobenzidine	4.634	0.20	5	0	92.7	15 - 120				
3-Nitroaniline	5.872	0.20	5	0	117	30 - 120				
4,6-Dinitro-2-methylphenol	5.243	0.20	5	0	105	25 - 121				
4-Bromophenyl phenyl ether	5.171	0.20	5	0	103	45 - 120				
4-Chloro-3-methylphenol	5.318	0.20	5	0	106	47 - 120				
4-Chloroaniline	5.59	0.20	5	0	112	20 - 120				
4-Chlorophenyl phenyl ether	5.273	0.20	5	0	105	50 - 120				
4-Nitroaniline	5.431	0.20	5	0	109	30 - 133				
4-Nitrophenol	5.425	1.0	5	0	108	30 - 130				
Acenaphthene	4.925	0.10	5	0	98.5	45 - 120				
Acenaphthylene	5.061	0.10	5	0	101	47 - 120				
Anthracene	5.487	0.10	5	0	110	45 - 120				
Benz(a)anthracene	5.3	0.10	5	0	106	40 - 120				
Benzidine	2.421	0.20	5	0	48.4	10 - 120				
Benzo(a)pyrene	5.881	0.10	5	0	118	45 - 120				
Benzo(b)fluoranthene	5.748	0.10	5	0	115	50 - 120				
Benzo(g,h,i)perylene	5.748	0.10	5	0	115	42 - 127				
Benzo(k)fluoranthene	5.528	0.10	5	0	111	45 - 127				
Benzyl alcohol	4.909	0.20	5	0	98.2	35 - 122				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: 141252 (0) **Instrument: SV-7** **Method: LOW-LEVEL SEMIVOLATILES BY 8270D**

LCS Sample ID: **LCS-141252** Units: **ug/L** Analysis Date: **29-May-2019 15:06**
Client ID: Run ID: **SV-7_339392** SeqNo: **5097142** PrepDate: **28-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bis(2-chloroethoxy)methane	5.277	0.20	5	0	106	45 - 120				
Bis(2-chloroethyl)ether	5.234	0.20	5	0	105	37 - 121				
Bis(2-chloroisopropyl)ether	5.219	0.20	5	0	104	40 - 120				
Bis(2-ethylhexyl)phthalate	5.739	0.20	5	0	115	40 - 139				
Butyl benzyl phthalate	5.741	0.20	5	0	115	47 - 123				
Carbazole	5.884	0.20	5	0	118	42 - 128				
Chrysene	5.551	0.10	5	0	111	43 - 120				
Dibenz(a,h)anthracene	5.823	0.10	5	0	116	45 - 125				
Dibenzofuran	5.3	0.10	5	0	106	50 - 120				
Diethyl phthalate	5.145	0.20	5	0	103	41 - 120				
Dimethyl phthalate	5.354	0.20	5	0	107	40 - 122				
Di-n-butyl phthalate	5.61	0.20	5	0	112	45 - 123				
Di-n-octyl phthalate	6.088	0.20	5	0	122	45 - 129				
Fluoranthene	5.565	0.10	5	0	111	45 - 125				
Fluorene	5.269	0.10	5	0	105	49 - 120				
Hexachlorobenzene	5.046	0.20	5	0	101	48 - 120				
Hexachlorobutadiene	4.74	0.20	5	0	94.8	40 - 120				
Hexachlorocyclopentadiene	4.178	0.20	5	0	83.6	34 - 136				
Hexachloroethane	5.11	0.20	5	0	102	40 - 120				
Indeno(1,2,3-cd)pyrene	5.517	0.10	5	0	110	41 - 128				
Isophorone	4.979	0.20	5	0	99.6	40 - 121				
Naphthalene	5.083	0.10	5	0	102	45 - 120				
Nitrobenzene	4.846	0.20	5	0	96.9	44 - 120				
N-Nitrosodimethylamine	4.607	0.20	5	0	92.1	30 - 121				
N-Nitrosodi-n-propylamine	4.987	0.20	5	0	99.7	40 - 120				
N-Nitrosodiphenylamine	5.569	0.20	5	0	111	40 - 125				
Pentachlorophenol	3.817	0.20	5	0	76.3	19 - 121				
Phenanthrene	5.236	0.10	5	0	105	45 - 121				
Phenol	5.086	0.20	5	0	102	20 - 124				
Pyrene	5.637	0.10	5	0	113	40 - 130				
Pyridine	4.357	1.0	5	0	87.1	15 - 120				
Surr: 2,4,6-Tribromophenol	*4.972*	*0.20*	*5*	*0*	*99.4*	*34 - 129*				
Surr: 2-Fluorobiphenyl	*5.364*	*0.20*	*5*	*0*	*107*	*40 - 125*				
Surr: 2-Fluorophenol	*4.874*	*0.20*	*5*	*0*	*97.5*	*20 - 120*				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: 141252 (0) **Instrument: SV-7** **Method: LOW-LEVEL SEMIVOLATILES BY 8270D**

LCS Sample ID: **LCS-141252** Units: **ug/L** Analysis Date: **29-May-2019 15:06**
Client ID: Run ID: **SV-7_339392** SeqNo: **5097142** PrepDate: **28-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: 4-Terphenyl-d14	*5.718*	*0.20*	*5*	*0*	*114*	*40 - 135*				
Surr: Nitrobenzene-d5	*4.888*	*0.20*	*5*	*0*	*97.8*	*41 - 120*				
Surr: Phenol-d6	*5.338*	*0.20*	*5*	*0*	*107*	*20 - 120*				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: 141252 (0) **Instrument: SV-7** **Method: LOW-LEVEL SEMIVOLATILES BY 8270D**

LCSD Sample ID: **LCSD-141252** Units: **ug/L** Analysis Date: **29-May-2019 15:25**
Client ID: Run ID: **SV-7_339392** SeqNo: **5097143** PrepDate: **28-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,2,4-Trichlorobenzene	5.074	0.20	5	0	101	45 - 120	5.177	2.01	20	
2,4,5-Trichlorophenol	4.615	0.20	5	0	92.3	46 - 120	5.318	14.2	20	
2,4,6-Trichlorophenol	4.947	0.20	5	0	98.9	42 - 120	5.279	6.5	20	
2,4-Dichlorophenol	5.143	0.20	5	0	103	49 - 120	5.291	2.84	20	
2,4-Dimethylphenol	5.128	0.20	5	0	103	35 - 120	5.142	0.267	20	
2,4-Dinitrophenol	3.642	1.0	5	0	72.8	15 - 120	4.508	21.2	50	
2,4-Dinitrotoluene	5.126	0.20	5	0	103	50 - 122	5.266	2.69	20	
2,6-Dinitrotoluene	5.488	0.20	5	0	110	50 - 120	5.574	1.55	20	
2-Chloronaphthalene	5.308	0.20	5	0	106	50 - 120	5.357	0.936	20	
2-Chlorophenol	5.187	0.20	5	0	104	40 - 120	5.224	0.71	20	
2-Methylnaphthalene	5.01	0.10	5	0	100	50 - 120	5.312	5.86	20	
2-Methylphenol	5.507	0.20	5	0	110	45 - 120	5.264	4.51	20	
2-Nitroaniline	5.626	0.20	5	0	113	28 - 139	5.011	11.6	20	
2-Nitrophenol	5.074	0.20	5	0	101	40 - 120	5.16	1.68	20	
3&4-Methylphenol	5.505	0.20	5	0	110	35 - 120	5.116	7.32	20	
3,3´-Dichlorobenzidine	5.081	0.20	5	0	102	15 - 120	4.634	9.21	20	
3-Nitroaniline	5.869	0.20	5	0	117	30 - 120	5.872	0.0431	20	
4,6-Dinitro-2-methylphenol	4.615	0.20	5	0	92.3	25 - 121	5.243	12.7	30	
4-Bromophenyl phenyl ether	5.137	0.20	5	0	103	45 - 120	5.171	0.649	20	
4-Chloro-3-methylphenol	5.091	0.20	5	0	102	47 - 120	5.318	4.37	20	
4-Chloroaniline	5.313	0.20	5	0	106	20 - 120	5.59	5.08	20	
4-Chlorophenyl phenyl ether	5.131	0.20	5	0	103	50 - 120	5.273	2.74	20	
4-Nitroaniline	5.766	0.20	5	0	115	30 - 133	5.431	6	20	
4-Nitrophenol	4.852	1.0	5	0	97.0	30 - 130	5.425	11.2	20	
Acenaphthene	4.824	0.10	5	0	96.5	45 - 120	4.925	2.07	20	
Acenaphthylene	5.07	0.10	5	0	101	47 - 120	5.061	0.173	20	
Anthracene	5.155	0.10	5	0	103	45 - 120	5.487	6.24	20	
Benz(a)anthracene	5.069	0.10	5	0	101	40 - 120	5.3	4.46	20	
Benzidine	1.735	0.20	5	0	34.7	10 - 120	2.421	33	30	R
Benzo(a)pyrene	5.867	0.10	5	0	117	45 - 120	5.881	0.24	20	
Benzo(b)fluoranthene	5.934	0.10	5	0	119	50 - 120	5.748	3.19	20	
Benzo(g,h,i)perylene	5.419	0.10	5	0	108	42 - 127	5.748	5.89	20	
Benzo(k)fluoranthene	5.521	0.10	5	0	110	45 - 127	5.528	0.126	20	
Benzyl alcohol	5.186	0.20	5	0	104	35 - 122	4.909	5.5	20	

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: 141252 (0) **Instrument: SV-7** **Method: LOW-LEVEL SEMIVOLATILES BY 8270D**

LCSD Sample ID: **LCSD-141252** Units: **ug/L** Analysis Date: **29-May-2019 15:25**
Client ID: Run ID: **SV-7_339392** SeqNo: **5097143** PrepDate: **28-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Bis(2-chloroethoxy)methane	5.188	0.20	5	0	104	45 - 120	5.277	1.69	20	
Bis(2-chloroethyl)ether	5.414	0.20	5	0	108	37 - 121	5.234	3.38	20	
Bis(2-chloroisopropyl)ether	5.253	0.20	5	0	105	40 - 120	5.219	0.663	20	
Bis(2-ethylhexyl)phthalate	5.335	0.20	5	0	107	40 - 139	5.739	7.31	20	
Butyl benzyl phthalate	5.32	0.20	5	0	106	47 - 123	5.741	7.62	20	
Carbazole	5.991	0.20	5	0	120	42 - 128	5.884	1.8	20	
Chrysene	5.136	0.10	5	0	103	43 - 120	5.551	7.77	20	
Dibenz(a,h)anthracene	5.833	0.10	5	0	117	45 - 125	5.823	0.159	20	
Dibenzofuran	5.101	0.10	5	0	102	50 - 120	5.3	3.84	20	
Diethyl phthalate	5.104	0.20	5	0	102	41 - 120	5.145	0.796	20	
Dimethyl phthalate	5.178	0.20	5	0	104	40 - 122	5.354	3.33	20	
Di-n-butyl phthalate	5.376	0.20	5	0	108	45 - 123	5.61	4.25	20	
Di-n-octyl phthalate	5.997	0.20	5	0	120	45 - 129	6.088	1.51	20	
Fluoranthene	5.538	0.10	5	0	111	45 - 125	5.565	0.475	20	
Fluorene	5.146	0.10	5	0	103	49 - 120	5.269	2.37	20	
Hexachlorobenzene	5.164	0.20	5	0	103	48 - 120	5.046	2.3	20	
Hexachlorobutadiene	4.782	0.20	5	0	95.6	40 - 120	4.74	0.873	20	
Hexachlorocyclopentadiene	3.814	0.20	5	0	76.3	34 - 136	4.178	9.12	20	
Hexachloroethane	5.051	0.20	5	0	101	40 - 120	5.11	1.15	20	
Indeno(1,2,3-cd)pyrene	5.903	0.10	5	0	118	41 - 128	5.517	6.76	20	
Isophorone	4.776	0.20	5	0	95.5	40 - 121	4.979	4.17	20	
Naphthalene	5.024	0.10	5	0	100	45 - 120	5.083	1.16	20	
Nitrobenzene	4.745	0.20	5	0	94.9	44 - 120	4.846	2.09	20	
N-Nitrosodimethylamine	4.461	0.20	5	0	89.2	30 - 121	4.607	3.22	20	
N-Nitrosodi-n-propylamine	5.129	0.20	5	0	103	40 - 120	4.987	2.8	20	
N-Nitrosodiphenylamine	5.514	0.20	5	0	110	40 - 125	5.569	0.99	20	
Pentachlorophenol	2.746	0.20	5	0	54.9	19 - 121	3.817	32.6	20	R
Phenanthrene	5.163	0.10	5	0	103	45 - 121	5.236	1.41	20	
Phenol	4.942	0.20	5	0	98.8	20 - 124	5.086	2.87	20	
Pyrene	5.417	0.10	5	0	108	40 - 130	5.637	3.99	20	
Pyridine	4.366	1.0	5	0	87.3	15 - 120	4.357	0.218	20	
Surr: 2,4,6-Tribromophenol	*4.961*	*0.20*	*5*	*0*	*99.2*	*34 - 129*	*4.972*	*0.23*	*20*	
Surr: 2-Fluorobiphenyl	*5.233*	*0.20*	*5*	*0*	*105*	*40 - 125*	*5.364*	*2.47*	*20*	
Surr: 2-Fluorophenol	*4.431*	*0.20*	*5*	*0*	*88.6*	*20 - 120*	*4.874*	*9.53*	*20*	

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: 141252 (0) **Instrument: SV-7** **Method: LOW-LEVEL SEMIVOLATILES BY 8270D**

LCSD Sample ID: **LCSD-141252** Units: **ug/L** Analysis Date: **29-May-2019 15:25**
Client ID: Run ID: **SV-7_339392** SeqNo: **5097143** PrepDate: **28-May-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: 4-Terphenyl-d14	*5.61*	*0.20*	*5*	*0*	*112*	*40 - 135*	*5.718*	*1.9*	*20*	
Surr: Nitrobenzene-d5	*4.775*	*0.20*	*5*	*0*	*95.5*	*41 - 120*	*4.888*	*2.34*	*20*	
Surr: Phenol-d6	*5.254*	*0.20*	*5*	*0*	*105*	*20 - 120*	*5.338*	*1.59*	*20*	

The following samples were analyzed in this batch: HS19051571-02

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: R339317 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-190528** Units: **ug/L** Analysis Date: **28-May-2019 22:27**
Client ID: Run ID: **VOA2_339317** SeqNo: **5095711** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	U	1.0								
1,1,2,2-Tetrachloroethane	U	1.0								
1,1,2-Trichloroethane	U	1.0								
1,1-Dichloroethane	U	1.0								
1,1-Dichloroethene	U	1.0								
1,2-Dichlorobenzene	U	1.0								
1,2-Dichloroethane	U	1.0								
1,2-Dichloropropane	U	1.0								
1,3-Dichlorobenzene	U	1.0								
1,4-Dichlorobenzene	U	1.0								
2-Butanone	U	2.0								
2-Hexanone	U	2.0								
4-Methyl-2-pentanone	U	2.0								
Acetone	U	2.0								
Benzene	U	1.0								
Bromochloromethane	U	1.0								
Bromodichloromethane	U	1.0								
Bromoform	U	1.0								
Bromomethane	U	1.0								
Carbon disulfide	U	2.0								
Carbon tetrachloride	U	1.0								
Chlorobenzene	U	1.0								
Chloroethane	U	1.0								
Chloroform	U	1.0								
Chloromethane	U	1.0								
cis-1,2-Dichloroethene	U	1.0								
cis-1,3-Dichloropropene	U	1.0								
Dibromochloromethane	U	1.0								
Ethylbenzene	U	1.0								
m,p-Xylene	U	2.0								
Methylene chloride	U	2.0								
o-Xylene	U	1.0								
Styrene	U	1.0								
Tetrachloroethene	U	1.0								

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: R339317 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-190528** Units: **ug/L** Analysis Date: **28-May-2019 22:27**
Client ID: Run ID: **VOA2_339317** SeqNo: **5095711** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Toluene	U	1.0								
trans-1,2-Dichloroethene	U	1.0								
trans-1,3-Dichloropropene	U	1.0								
Trichloroethene	U	1.0								
Vinyl acetate	U	1.0								
Vinyl chloride	U	1.0								
Xylenes, Total	U	1.0								
1,2-Dichloroethene, Total	U	1.0								
Surr: 1,2-Dichloroethane-d4	*52*	*1.0*	*50*	*0*	*104*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*49.38*	*1.0*	*50*	*0*	*98.8*	*82 - 115*				
Surr: Dibromofluoromethane	*51.41*	*1.0*	*50*	*0*	*103*	*73 - 126*				
Surr: Toluene-d8	*51.27*	*1.0*	*50*	*0*	*103*	*81 - 120*				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: R339317 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

LCS Sample ID: **VLCSW-190528** Units: **ug/L** Analysis Date: **28-May-2019 22:02**
Client ID: Run ID: **VOA2_339317** SeqNo: **5095710** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	21.34	1.0	20	0	107	70 - 130				
1,1,2,2-Tetrachloroethane	22.13	1.0	20	0	111	70 - 120				
1,1,2-Trichloroethane	20.37	1.0	20	0	102	77 - 113				
1,1-Dichloroethane	19.69	1.0	20	0	98.5	71 - 122				
1,1-Dichloroethene	20.31	1.0	20	0	102	70 - 130				
1,2-Dichlorobenzene	20.89	1.0	20	0	104	77 - 113				
1,2-Dichloroethane	19.7	1.0	20	0	98.5	70 - 124				
1,2-Dichloropropane	20.25	1.0	20	0	101	72 - 119				
1,3-Dichlorobenzene	20.48	1.0	20	0	102	78 - 118				
1,4-Dichlorobenzene	20.44	1.0	20	0	102	79 - 113				
2-Butanone	47.24	2.0	40	0	118	70 - 130				
2-Hexanone	49.29	2.0	40	0	123	70 - 130				
4-Methyl-2-pentanone	48.91	2.0	40	0	122	70 - 130				
Acetone	51.71	2.0	40	0	129	70 - 130				
Benzene	18.77	1.0	20	0	93.8	74 - 120				
Bromochloromethane	19.46	1.0	20	0	97.3	76 - 124				
Bromodichloromethane	20.04	1.0	20	0	100	74 - 122				
Bromoform	20.42	1.0	20	0	102	73 - 128				
Bromomethane	22.27	1.0	20	0	111	70 - 130				
Carbon disulfide	40.51	2.0	40	0	101	70 - 130				
Carbon tetrachloride	19.28	1.0	20	0	96.4	71 - 125				
Chlorobenzene	20.46	1.0	20	0	102	76 - 113				
Chloroethane	18.66	1.0	20	0	93.3	70 - 130				
Chloroform	19.39	1.0	20	0	97.0	71 - 121				
Chloromethane	19.8	1.0	20	0	99.0	70 - 129				
cis-1,2-Dichloroethene	19.99	1.0	20	0	99.9	75 - 122				
cis-1,3-Dichloropropene	20.58	1.0	20	0	103	73 - 127				
Dibromochloromethane	21.8	1.0	20	0	109	77 - 122				
Ethylbenzene	19.96	1.0	20	0	99.8	77 - 117				
m,p-Xylene	38.68	2.0	40	0	96.7	77 - 122				
Methylene chloride	21.1	2.0	20	0	106	70 - 127				
o-Xylene	20.48	1.0	20	0	102	75 - 119				
Styrene	20.98	1.0	20	0	105	72 - 126				
Tetrachloroethene	20.71	1.0	20	0	104	76 - 119				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: R339317 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

LCS Sample ID: **VLCSW-190528** Units: **ug/L** Analysis Date: **28-May-2019 22:02**
Client ID: Run ID: **VOA2_339317** SeqNo: **5095710** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Toluene	18.78	1.0	20	0	93.9	77 - 118				
trans-1,2-Dichloroethene	19.36	1.0	20	0	96.8	72 - 127				
trans-1,3-Dichloropropene	21.35	1.0	20	0	107	77 - 119				
Trichloroethene	19.91	1.0	20	0	99.6	77 - 121				
Vinyl acetate	43.77	1.0	40	0	109	70 - 130				
Vinyl chloride	22.27	1.0	20	0	111	70 - 130				
Xylenes, Total	59.16	1.0	60	0	98.6	75 - 122				
1,2-Dichloroethene, Total	39.35	1.0	40	0	98.4	72 - 127				
Surr: 1,2-Dichloroethane-d4	*54.89*	*1.0*	*50*	*0*	*110*	*70 - 130*				
Surr: 4-Bromofluorobenzene	*49.54*	*1.0*	*50*	*0*	*99.1*	*82 - 115*				
Surr: Dibromofluoromethane	*50.17*	*1.0*	*50*	*0*	*100*	*73 - 126*				
Surr: Toluene-d8	*52.01*	*1.0*	*50*	*0*	*104*	*81 - 120*				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: R339317 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MS Sample ID: **HS19051327-01MS** Units: **ug/L** Analysis Date: **28-May-2019 23:40**
Client ID: Run ID: **VOA2_339317** SeqNo: **5095714** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	21.22	1.0	20	0	106	70 - 130				
1,1,2,2-Tetrachloroethane	20.31	1.0	20	0	102	70 - 123				
1,1,2-Trichloroethane	18.58	1.0	20	0	92.9	70 - 117				
1,1-Dichloroethane	19.69	1.0	20	0	98.5	70 - 127				
1,1-Dichloroethene	19.13	1.0	20	0	95.6	70 - 130				
1,2-Dichlorobenzene	19.55	1.0	20	0	97.8	70 - 115				
1,2-Dichloroethane	18.44	1.0	20	0	92.2	70 - 127				
1,2-Dichloropropane	19.21	1.0	20	0	96.1	70 - 122				
1,3-Dichlorobenzene	19.3	1.0	20	0	96.5	70 - 119				
1,4-Dichlorobenzene	19.17	1.0	20	0	95.9	70 - 114				
2-Butanone	42.52	2.0	40	0	106	70 - 130				
2-Hexanone	43.93	2.0	40	0	110	70 - 130				
4-Methyl-2-pentanone	44.73	2.0	40	0	112	70 - 130				
Acetone	46.41	2.0	40	0	116	70 - 130				
Benzene	18	1.0	20	0	90.0	70 - 127				
Bromochloromethane	18.71	1.0	20	0	93.5	70 - 127				
Bromodichloromethane	18.98	1.0	20	0	94.9	70 - 124				
Bromoform	18.23	1.0	20	0	91.1	70 - 129				
Bromomethane	20.55	1.0	20	0	103	70 - 130				
Carbon disulfide	37.37	2.0	40	0	93.4	70 - 130				
Carbon tetrachloride	20.22	1.0	20	0	101	70 - 130				
Chlorobenzene	18.92	1.0	20	0	94.6	70 - 114				
Chloroethane	18.74	1.0	20	0	93.7	70 - 130				
Chloroform	18.55	1.0	20	0	92.8	70 - 125				
Chloromethane	16.19	1.0	20	0	80.9	70 - 130				
cis-1,2-Dichloroethene	19.22	1.0	20	0	96.1	70 - 128				
cis-1,3-Dichloropropene	19.27	1.0	20	0	96.3	70 - 125				
Dibromochloromethane	19.73	1.0	20	0	98.6	70 - 124				
Ethylbenzene	19.17	1.0	20	0	95.8	70 - 124				
m,p-Xylene	36.88	2.0	40	0	92.2	70 - 130				
Methylene chloride	17.98	2.0	20	0	89.9	70 - 128				
o-Xylene	19.16	1.0	20	0	95.8	70 - 124				
Styrene	19.27	1.0	20	0	96.3	70 - 130				
Tetrachloroethene	19.85	1.0	20	0	99.2	70 - 130				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: R339317 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MS Sample ID: **HS19051327-01MS** Units: **ug/L** Analysis Date: **28-May-2019 23:40**
Client ID: Run ID: **VOA2_339317** SeqNo: **5095714** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Toluene	17.8	1.0	20	0	89.0	70 - 123				
trans-1,2-Dichloroethene	18.41	1.0	20	0	92.0	70 - 130				
trans-1,3-Dichloropropene	19.64	1.0	20	0	98.2	70 - 121				
Trichloroethene	19.56	1.0	20	0	97.8	70 - 129				
Vinyl acetate	36.66	1.0	40	0	91.6	70 - 130				
Vinyl chloride	18.22	1.0	20	0	91.1	70 - 130				
Xylenes, Total	56.03	1.0	60	0	93.4	70 - 130				
1,2-Dichloroethene, Total	37.62	1.0	40	0	94.1	70 - 130				
Surr: 1,2-Dichloroethane-d4	*53.21*	*1.0*	*50*	*0*	*106*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*49.95*	*1.0*	*50*	*0*	*99.9*	*81 - 113*				
Surr: Dibromofluoromethane	*49.99*	*1.0*	*50*	*0*	*100.0*	*77 - 123*				
Surr: Toluene-d8	*50.81*	*1.0*	*50*	*0*	*102*	*82 - 127*				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: R339317 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS19051327-01MSD** Units: **ug/L** Analysis Date: **29-May-2019 00:04**
Client ID: Run ID: **VOA2_339317** SeqNo: **5095715** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1-Trichloroethane	20.69	1.0	20	0	103	70 - 130	21.22	2.51	20	
1,1,2,2-Tetrachloroethane	20.43	1.0	20	0	102	70 - 123	20.31	0.583	20	
1,1,2-Trichloroethane	18.58	1.0	20	0	92.9	70 - 117	18.58	0.0195	20	
1,1-Dichloroethane	18.9	1.0	20	0	94.5	70 - 127	19.69	4.09	20	
1,1-Dichloroethene	18.2	1.0	20	0	91.0	70 - 130	19.13	4.98	20	
1,2-Dichlorobenzene	19.52	1.0	20	0	97.6	70 - 115	19.55	0.168	20	
1,2-Dichloroethane	18.53	1.0	20	0	92.6	70 - 127	18.44	0.485	20	
1,2-Dichloropropane	19.13	1.0	20	0	95.7	70 - 122	19.21	0.416	20	
1,3-Dichlorobenzene	18.88	1.0	20	0	94.4	70 - 119	19.3	2.22	20	
1,4-Dichlorobenzene	18.85	1.0	20	0	94.3	70 - 114	19.17	1.67	20	
2-Butanone	42.42	2.0	40	0	106	70 - 130	42.52	0.229	20	
2-Hexanone	45.48	2.0	40	0	114	70 - 130	43.93	3.48	20	
4-Methyl-2-pentanone	45.21	2.0	40	0	113	70 - 130	44.73	1.07	20	
Acetone	49.36	2.0	40	0	123	70 - 130	46.41	6.14	20	
Benzene	17.58	1.0	20	0	87.9	70 - 127	18	2.37	20	
Bromochloromethane	18.27	1.0	20	0	91.4	70 - 127	18.71	2.36	20	
Bromodichloromethane	19.11	1.0	20	0	95.5	70 - 124	18.98	0.669	20	
Bromoform	18.46	1.0	20	0	92.3	70 - 129	18.23	1.26	20	
Bromomethane	18.8	1.0	20	0	94.0	70 - 130	20.55	8.92	20	
Carbon disulfide	36.11	2.0	40	0	90.3	70 - 130	37.37	3.43	20	
Carbon tetrachloride	19.64	1.0	20	0	98.2	70 - 130	20.22	2.89	20	
Chlorobenzene	18.65	1.0	20	0	93.3	70 - 114	18.92	1.42	20	
Chloroethane	18.71	1.0	20	0	93.6	70 - 130	18.74	0.128	20	
Chloroform	18.03	1.0	20	0	90.2	70 - 125	18.55	2.85	20	
Chloromethane	15.35	1.0	20	0	76.7	70 - 130	16.19	5.35	20	
cis-1,2-Dichloroethene	18.69	1.0	20	0	93.5	70 - 128	19.22	2.77	20	
cis-1,3-Dichloropropene	19.02	1.0	20	0	95.1	70 - 125	19.27	1.3	20	
Dibromochloromethane	19.45	1.0	20	0	97.2	70 - 124	19.73	1.44	20	
Ethylbenzene	18.84	1.0	20	0	94.2	70 - 124	19.17	1.69	20	
m,p-Xylene	36.11	2.0	40	0	90.3	70 - 130	36.88	2.11	20	
Methylene chloride	18.02	2.0	20	0	90.1	70 - 128	17.98	0.198	20	
o-Xylene	18.99	1.0	20	0	95.0	70 - 124	19.16	0.872	20	
Styrene	19.05	1.0	20	0	95.3	70 - 130	19.27	1.11	20	
Tetrachloroethene	19.26	1.0	20	0	96.3	70 - 130	19.85	2.98	20	

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: R339317 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS19051327-01MSD** Units: **ug/L** Analysis Date: **29-May-2019 00:04**
Client ID: Run ID: **VOA2_339317** SeqNo: **5095715** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Toluene	17.46	1.0	20	0	87.3	70 - 123	17.8	1.91	20	
trans-1,2-Dichloroethene	17.73	1.0	20	0	88.6	70 - 130	18.41	3.77	20	
trans-1,3-Dichloropropene	19.44	1.0	20	0	97.2	70 - 121	19.64	0.987	20	
Trichloroethene	19.23	1.0	20	0	96.2	70 - 129	19.56	1.72	20	
Vinyl acetate	38.38	1.0	40	0	95.9	70 - 130	36.66	4.59	20	
Vinyl chloride	16.95	1.0	20	0	84.7	70 - 130	18.22	7.26	20	
Xylenes, Total	55.1	1.0	60	0	91.8	70 - 130	56.03	1.69	20	
1,2-Dichloroethene, Total	36.42	1.0	40	0	91.0	70 - 130	37.62	3.26	20	
Surr: 1,2-Dichloroethane-d4	*53.4*	*1.0*	*50*	*0*	*107*	*70 - 126*	*53.21*	*0.35*	*20*	
Surr: 4-Bromofluorobenzene	*49.28*	*1.0*	*50*	*0*	*98.6*	*81 - 113*	*49.95*	*1.35*	*20*	
Surr: Dibromofluoromethane	*50.09*	*1.0*	*50*	*0*	*100*	*77 - 123*	*49.99*	*0.191*	*20*	
Surr: Toluene-d8	*51.5*	*1.0*	*50*	*0*	*103*	*82 - 127*	*50.81*	*1.36*	*20*	

The following samples were analyzed in this batch: HS19051571-02

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: R339261 (0) **Instrument: UV-2450** **Method: REACTIVE CYANIDE**

MBLK Sample ID: **MBLK-R339261** Units: **mg/Kg** Analysis Date: **28-May-2019 12:00**
Client ID: Run ID: **UV-2450_339261** SeqNo: **5094189** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Reactive Cyanide	U	100								

LCS Sample ID: **LCS-R339261** Units: **mg/Kg** Analysis Date: **28-May-2019 12:00**
Client ID: Run ID: **UV-2450_339261** SeqNo: **5094188** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Reactive Cyanide	0.63	10.0	10	0	6.30	5 - 100				J

MS Sample ID: **HS19051202-02MS** Units: **mg/Kg** Analysis Date: **28-May-2019 12:00**
Client ID: Run ID: **UV-2450_339261** SeqNo: **5094190** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Reactive Cyanide	0.6	10.0	10	0.01	5.90	5 - 100				J

The following samples were analyzed in this batch: HS19051571-01

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: R339262 (0) **Instrument: WetChem_HS** **Method: REACTIVE SULFIDE**

MBLK Sample ID: **MBLK-R339262** Units: **mg/Kg** Analysis Date: **28-May-2019 14:00**
Client ID: Run ID: **WetChem_HS_339262** SeqNo: **5094201** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Reactive Sulfide	U	100								

LCS Sample ID: **LCS-R339262** Units: **mg/Kg** Analysis Date: **28-May-2019 14:00**
Client ID: Run ID: **WetChem_HS_339262** SeqNo: **5094200** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Reactive Sulfide	64	10.0	100	0	64.0	20 - 120				

MS Sample ID: **HS19051202-02MS** Units: **mg/Kg** Analysis Date: **28-May-2019 14:00**
Client ID: Run ID: **WetChem_HS_339262** SeqNo: **5094202** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Reactive Sulfide	60	10.0	100	0	60.0	20 - 120				

The following samples were analyzed in this batch: HS19051571-01

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: R339477 (0) **Instrument: WetChem_HS** **Method: PH SOIL BY SW9045D**

DUP Sample ID: **HS19051298-09DUP** Units: **pH Units** Analysis Date: **30-May-2019 13:30**
Client ID: Run ID: **WetChem_HS_339477** SeqNo: **5098702** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH	8.33	0.100					8.34	0.12	10	
Temp Deg C @pH	22.1	0					22.1	0	10	

The following samples were analyzed in this batch: HS19051571-01

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

QC BATCH REPORT

Batch ID: R339494 (0) **Instrument:** WetChem_HS **Method:** FLASH POINT BY PENSKY-MARTENS SW1010A

LCS Sample ID: **LCS-R339494** Units: **°F** Analysis Date: **30-May-2019 13:50**
Client ID: Run ID: **WetChem_HS_339494** SeqNo: **5099160** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ignitability	82.78	70.0	81	0	102	95 - 105				

DUP Sample ID: **HS19051571-01DUP** Units: **°F** Analysis Date: **30-May-2019 13:50**
Client ID: **NAPL-1620-NCS_Oil-20190524** Run ID: **WetChem_HS_339494** SeqNo: **5099161** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ignitability	79.78	70.0					78.78	1.26	20	

The following samples were analyzed in this batch: HS19051571-01

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: **HS19051571**

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
Date	
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020
Texas	TX104704231-19-23	30-Apr-2020

Sample Receipt Checklist

Client Name: PBW - Houston
Work Order: HS19051571

Date/Time Received: **24-May-2019 17:50**
Received by: **PMG**

Checklist completed by: *Paresh M. Giga* eSignature — 25-May-2019 Date

Reviewed by: *Dane J. Wacasey* eSignature — 29-May-2019 Date

Matrices: **Oil/Water**

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:205451
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.6c U/c	IR25	
Cooler(s)/Kit(s):	24587		
Date/Time sample(s) sent to storage:	5/24/19 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:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page __ of __

COC ID: 205451

ALS Project Manager:		ALS Work Order #:	

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Englewood Yard Englewo	A	8260_LL_W (5632528 Volatile Organics)
Work Order		Project Number	1598-04-Rev0 SR NID__	B	8270_LOW_W (5632532 Semivolatile Organics)
Company Name	Golder Associates Inc.	Bill To Company	Union Pacific Railroad- A/P	C	RCRA 8 Waters (5652643 RCRA 8 Metals) 8/12 TX
Send Report To	Eric Matzner	Invoice Attn	Accounts Payable	D	TX1005_W_Low (5643233 TPH TX1005)
Address	11231 Richmond Avenue Suite D104	Address	1400 Douglas Street Stop 0750	E	RCN_W (5652638 Reactive Cyanide - RCI)
				F	RS_W (5652638 Reactive Sulfide - RCI)
City/State/Zip	Houston, TX 77082	City/State/Zip	Omaha NE 681790750	G	pH_W_9040C (5632436 pH - RCI)
Phone	(832) 916-3691	Phone		H	IGN_W (5652637 Ignitability - RCI)
Fax		Fax		I	1311_METALS_HS (5640672 5652643 TCLP RCRA 8 H4 (TX12
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	Oil	5.24.19	14:30	Oil	8	1					X	X	X	X	X		
2	Water	5.24.19	14:30	Water	8	9	X	X	X	X							
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

HS19051571

Golder Associates Inc.

uston TX-Englewood Yard Englewood Modular Offic

Sampler(s) Please Print & Sign: Sarah Balke Sarah Balke

Shipment Method: Delivery

Required Turnaround Time: (Check Box) [X] 3 [ ] STD 10 Wk Days [ ] 5 Wk Days [ ] 2 Wk Days [ ] 24 Hour

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
Sarah Balke	5.24.19	16:05	RBuyung
RBuyung	5-24-19	17:50	5/24/19 17:50
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes: UPRR Houston Englewood

Cooler ID	Cooler Temp.
24587	VIC 3.6 +2 C/F 0.6

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

June 06, 2019

Eric Matzner
Golder Associates Inc.
11231 Richmond Avenue
Suite D104
Houston, TX 77082

Work Order: **HS19051893**

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

Dear Eric,

ALS Environmental received 1 sample(s) on May 31, 2019 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: DANE.WACASEY
Dane J. Wacasey

Client:	Golder Associates Inc.	**TRRP Laboratory Data Package Cover Page**
Project:	Houston TX-Wood Preserving Works	
WorkOrder:	**HS19051893**	

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:	**HS19051893**

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: 06/05/2019				
Project Name: Houston TX-Wood Preserving Works			Laboratory Job Number: HS19051893				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 141524, 141603, R339809				
#[1]	**A[2]**	**Description**	**Yes**	**No**	**NA[3]**	**NR[4]**	**ER#[5]**
R1	OI	**Chain-of-custody (C-O-C)**					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	**Sample and quality control (QC) identification**					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	**Test reports**					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
R4	O	**Surrogate recovery data**					
		Were surrogates added prior to extraction?	X				
		Were surrogate percent recoveries in all samples within the laboratory QC limits?		X			1
R5	OI	**Test reports/summary forms for blank samples**					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	**Laboratory control samples (LCS):**					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	**Matrix spike (MS) and matrix spike duplicate (MSD) data**					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			2
		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				3
		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				4

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group			LRC Date: 06/05/2019				
Project Name: Houston TX-Wood Preserving Works			Laboratory Job Number: HS19051893				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 141524, 141603, R339809				
#[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: 06/05/2019
Project Name: Houston TX-Wood Preserving Works	Laboratory Job Number: HS19051893
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 141524, 141603, R339809

ER#[5]	Description
1	Texas TPH by Method TX1005, Sample NAPL-1620-NCS_Oil-20190524, surrogate recoveries could not be determined due to dilution below the calibration range.
2	Batch R339809, Volatiles by Method SW8260, Sample HS19051517-15, MS was performed on an unrelated sample
3	This report contains additional analyses. The sample was originally reported in ALS work order HS19051571.
4	TPH TX 1006: ALS is NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package. Because TCEQ does not offer accreditation for TX 1006, the results are flagged with n.

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: HS19051893

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19051893-01	NAPL-1620-NCS_Oil-20190524	Oil	HS19051571-01 A	24-May-2019 14:30	31-May-2019 12:00	☐

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: NAPL-1620-NCS_Oil-20190524
Collection Date: 24-May-2019 14:30

ANALYTICAL REPORT
WorkOrder:HS19051893
Lab ID:HS19051893-01
Matrix:Oil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene	**210**		**2.5**	**25**	**mg/Kg**	5000	05-Jun-2019 12:52
Ethylbenzene	**2,200**		**35**	**250**	**mg/Kg**	50000	05-Jun-2019 11:37
m,p-Xylene	**940**		**7.9**	**50**	**mg/Kg**	5000	05-Jun-2019 12:52
o-Xylene	**380**		**5.0**	**25**	**mg/Kg**	5000	05-Jun-2019 12:52
Toluene	**870**		**30**	**250**	**mg/Kg**	50000	05-Jun-2019 11:37
Xylenes, Total	**1,300**		**5.0**	**25**	**mg/Kg**	5000	05-Jun-2019 12:52
Surr: 1,2-Dichloroethane-d4	*103*			*70-126*	*%REC*	*50000*	*05-Jun-2019 11:37*
Surr: 1,2-Dichloroethane-d4	*100*			*70-126*	*%REC*	*5000*	*05-Jun-2019 12:52*
Surr: 4-Bromofluorobenzene	*94.4*			*70-130*	*%REC*	*50000*	*05-Jun-2019 11:37*
Surr: 4-Bromofluorobenzene	*93.9*			*70-130*	*%REC*	*5000*	*05-Jun-2019 12:52*
Surr: Dibromofluoromethane	*89.6*			*70-130*	*%REC*	*5000*	*05-Jun-2019 12:52*
Surr: Dibromofluoromethane	*88.7*			*70-130*	*%REC*	*50000*	*05-Jun-2019 11:37*
Surr: Toluene-d8	*101*			*70-130*	*%REC*	*50000*	*05-Jun-2019 11:37*
Surr: Toluene-d8	*99.4*			*70-130*	*%REC*	*5000*	*05-Jun-2019 12:52*
TEXAS TPH BY TX1005		**Method:TX1005**			Prep:TX1005PR / 03-Jun-2019		Analyst: MBG
nC6 to nC12	**350,000**		**7300**	**49000**	**mg/Kg**	100	04-Jun-2019 03:04
>nC12 to nC28	**150,000**		**9600**	**49000**	**mg/Kg**	100	04-Jun-2019 03:04
>nC28 to nC35	**50,000**		**9600**	**49000**	**mg/Kg**	100	04-Jun-2019 03:04
Total Petroleum Hydrocarbon	**550,000**		**7300**	**49000**	**mg/Kg**	100	04-Jun-2019 03:04
Surr: 2-Fluorobiphenyl	*0*	*S*		*70-130*	*%REC*	*100*	*04-Jun-2019 03:04*
Surr: Trifluoromethyl benzene	*0*	*S*		*70-130*	*%REC*	*100*	*04-Jun-2019 03:04*

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Sample ID: NAPL-1620-NCS_Oil-20190524
Collection Date: 24-May-2019 14:30

ANALYTICAL REPORT
WorkOrder:HS19051893
Lab ID:HS19051893-01
Matrix:Oil

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
PETROLEUM HYDROCARBONS BY TX1006	**Method:TX1006**				Prep:TX1006PR / 04-Jun-2019		Analyst: MBG
Aliphatics nC6	U	n	4900	9800	mg/Kg	100	04-Jun-2019 18:14
Aliphatics >nC6 to nC8	**28,000**	n	**4900**	**9800**	**mg/Kg**	100	04-Jun-2019 18:14
Aliphatics >nC8 to nC10	**330,000**	n	**4900**	**9800**	**mg/Kg**	100	04-Jun-2019 18:14
Aliphatics >nC10 to nC12	**21,000**	n	**4900**	**9800**	**mg/Kg**	100	04-Jun-2019 18:14
Aliphatics >nC12 to nC16	**60,000**	n	**4900**	**9800**	**mg/Kg**	100	04-Jun-2019 18:14
Aliphatics >nC16 to nC21	**23,000**	n	**4900**	**9800**	**mg/Kg**	100	04-Jun-2019 18:14
Aliphatics >nC21 to nC35	**34,000**	n	**4900**	**9800**	**mg/Kg**	100	04-Jun-2019 18:14
Total Aliphatic Fraction	**496,000**	n	**4900**	**9800**	**mg/Kg**	100	04-Jun-2019 18:14
Aliphatics Relative % Distribution	**90**	n	**0**	**0**	**%**	100	04-Jun-2019 18:14
Aromatics >nC7 to nC8	U	n	4900	9800	mg/Kg	100	04-Jun-2019 20:39
Aromatics >nC8 to nC10	**22,000**	n	**4900**	**9800**	**mg/Kg**	100	04-Jun-2019 20:39
Aromatics >nC10 to nC12	**9,500**	Jn	**4900**	**9800**	**mg/Kg**	100	04-Jun-2019 20:39
Aromatics >nC12 to nC16	**20,000**	n	**4900**	**9800**	**mg/Kg**	100	04-Jun-2019 20:39
Aromatics >nC16 to nC21	**6,300**	Jn	**4900**	**9800**	**mg/Kg**	100	04-Jun-2019 20:39
Aromatics >nC21 to nC35	U	n	4900	9800	mg/Kg	100	04-Jun-2019 20:39
Total Aromatic Fraction	**57,800**	n	**4900**	**9800**	**mg/Kg**	100	04-Jun-2019 20:39
Aromatics Relative % Distribution	**10**	n	**0**	**0**	**%**	100	04-Jun-2019 20:39
Total Petroleum Hydrocarbons	**550,000**	n	**4900**	**9800**	**mg/Kg**	100	04-Jun-2019 18:14

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

WEIGHT LOG

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051893

Batch ID: 3124 **Method:** VOLATILES BY SW8260C

SampID	Container	Sample Wt/Vol	Final Volume	Weight Factor	Container Type
HS19051893-01	1	5.047 (g)	5 (mL)	0.99	Bulk (5030B)

Batch ID: 141524 **Method:** TEXAS TPH BY TX1005 **Prep:** TX 1005_S PR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19051893-01	1	1.02	10 (mL)	9.804

Batch ID: 141603 **Method:** PETROLEUM HYDROCARBONS BY TX1006 **Prep:** TX 1006_S PR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19051893-01	1	1.02	10 (mL)	9.804

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051893

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 141524	**Test Name :** TEXAS TPH BY TX1005			**Matrix:** Oil		
HS19051893-01	NAPL-1620-NCS_Oil-20190524	24 May 2019 14:30		03 Jun 2019 09:30	04 Jun 2019 03:04	100
Batch ID 141603	**Test Name :** PETROLEUM HYDROCARBONS BY TX1006			**Matrix:** Oil		
HS19051893-01	NAPL-1620-NCS_Oil-20190524	24 May 2019 14:30		04 Jun 2019 08:30	04 Jun 2019 20:39	100
HS19051893-01	NAPL-1620-NCS_Oil-20190524	24 May 2019 14:30		04 Jun 2019 08:30	04 Jun 2019 18:14	100
Batch ID R339809	**Test Name :** VOLATILES BY SW8260C			**Matrix:** Oil		
HS19051893-01	NAPL-1620-NCS_Oil-20190524	24 May 2019 14:30			05 Jun 2019 12:52	5000
HS19051893-01	NAPL-1620-NCS_Oil-20190524	24 May 2019 14:30			05 Jun 2019 11:37	50000

WorkOrder: HS19051893
InstrumentID: FID-12
Test Code: TX1005_S_REV3
Test Number: TX1005
Test Name: Texas TPH by TX1005

METHOD DETECTION / REPORTING LIMITS

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

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	nC6 to nC12	TPH-1005-1	25	23	7.4	50
A	>nC12 to nC28	TPH-1005-2	25	23	9.8	50
A	>nC28 to nC35	TPH-1005-4	25	23	9.8	50
A	Total Petroleum Hydrocarbon	TPH	25	23	7.4	50
S	2-Fluorobiphenyl	321-60-8	0	0	0	0
S	Trifluoromethyl benzene	98-08-8	0	0	0	0

WorkOrder: HS19051893
InstrumentID: FID-10
Test Code: TX1006_S
Test Number: TX1006
Test Name: Petroleum Hydrocarbons by

METHOD DETECTION / REPORTING LIMITS

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

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Aliphatics nC6	PHC6ALIP	0	0	5.0	10
A	Aliphatics >nC6 to nC8	PHCG68ALIP	0	0	5.0	10
A	Aliphatics >nC8 to nC10	PHCG810ALIP	0	0	5.0	10
A	Aliphatics >nC10 to nC12	PHCG1012ALIP	0	0	5.0	10
A	Aliphatics >nC12 to nC16	PHCG1216ALIP	0	0	5.0	10
A	Aliphatics >nC16 to nC21	PHCG1621ALIP	0	0	5.0	10
A	Aliphatics >nC21 to nC35	PHCG2135ALIP	0	0	5.0	10
A	Total Aliphatic Fraction	TOTALIPFRACT	0	0	5.0	10
A	Aliphatics Relative % Distribution	ALPRELPERDIST	0	0	0	0
A	Aromatics >nC7 to nC8	PHCG78AROM	0	0	5.0	10
A	Aromatics >nC8 to nC10	PHCG810AROM	0	0	5.0	10
A	Aromatics >nC10 to nC12	PHCG1012AROM	0	0	5.0	10
A	Aromatics >nC12 to nC16	PHCG1216AROM	0	0	5.0	10
A	Aromatics >nC16 to nC21	PHCG1621AROM	0	0	5.0	10
A	Aromatics >nC21 to nC35	PHCG2135AROM	0	0	5.0	10
A	Total Aromatic Fraction	TOTAROFRACT	0	0	5.0	10
A	Aromatics Relative % Distribution	ARORELPERCDIST	0	0	0	0
A	Total Petroleum Hydrocarbons	PHCG635AROMALIP	0	0	5.0	10

WorkOrder: HS19051893
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	m,p-Xylene	179601-23-1	0.0025	0.0030	0.0016	0.010
A	o-Xylene	95-47-6	0.0012	0.0015	0.0010	0.0050
A	Toluene	108-88-3	0.0012	0.0015	0.00060	0.0050
A	Xylenes, Total	1330-20-7	0.0012	0.0015	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: HS19051893

QC BATCH REPORT

Batch ID: 141524 (0) **Instrument: FID-12** **Method: TEXAS TPH BY TX1005**

MBLK Sample ID: **MBLK-141524** Units: **mg/Kg** Analysis Date: **03-Jun-2019 18:28**
Client ID: Run ID: **FID-12_339738** SeqNo: **5105219** PrepDate: **03-Jun-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	U	50								
>nC12 to nC28	U	50								
>nC28 to nC35	U	50								
Total Petroleum Hydrocarbon	U	50								
Surr: 2-Fluorobiphenyl	*22.82*	*0*	*25*	*0*	*91.3*	*70 - 130*				
Surr: Trifluoromethyl benzene	*23.28*	*0*	*25*	*0*	*93.1*	*70 - 130*				

LCS Sample ID: **LCS-141524** Units: **mg/Kg** Analysis Date: **03-Jun-2019 18:56**
Client ID: Run ID: **FID-12_339738** SeqNo: **5105220** PrepDate: **03-Jun-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	213.1	50	250	0	85.2	75 - 125				
>nC12 to nC28	224	50	250	0	89.6	75 - 125				
Surr: 2-Fluorobiphenyl	*23.45*	*0*	*25*	*0*	*93.8*	*70 - 130*				
Surr: Trifluoromethyl benzene	*21.76*	*0*	*25*	*0*	*87.0*	*70 - 130*				

LCSD Sample ID: **LCSD-141524** Units: **mg/Kg** Analysis Date: **03-Jun-2019 19:25**
Client ID: Run ID: **FID-12_339738** SeqNo: **5105221** PrepDate: **03-Jun-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	217.4	50	250	0	86.9	75 - 125	213.1	1.99	20	
>nC12 to nC28	243.9	50	250	0	97.6	75 - 125	224	8.5	20	
Surr: 2-Fluorobiphenyl	*25.23*	*0*	*25*	*0*	*101*	*70 - 130*	*23.45*	*7.3*	*20*	
Surr: Trifluoromethyl benzene	*23.22*	*0*	*25*	*0*	*92.9*	*70 - 130*	*21.76*	*6.51*	*20*	

MS Sample ID: **HS19051904-01MS** Units: **mg/Kg** Analysis Date: **03-Jun-2019 20:23**
Client ID: Run ID: **FID-12_339738** SeqNo: **5105223** PrepDate: **03-Jun-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	264.2	48	241.5	0	109	75 - 125				
>nC12 to nC28	268.9	48	241.5	0	111	75 - 125				
Surr: 2-Fluorobiphenyl	*26.7*	*0*	*24.15*	*0*	*111*	*70 - 130*				
Surr: Trifluoromethyl benzene	*25.89*	*0*	*24.15*	*0*	*107*	*70 - 130*				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051893

QC BATCH REPORT

Batch ID: 141524 (0) **Instrument: FID-12** **Method: TEXAS TPH BY TX1005**

MSD Sample ID: **HS19051904-01MSD** Units: **mg/Kg** Analysis Date: **03-Jun-2019 20:51**
Client ID: Run ID: **FID-12_339738** SeqNo: **5105224** PrepDate: **03-Jun-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	247.9	49	245.1	0	101	75 - 125	264.2	6.36	20	
>nC12 to nC28	253.2	49	245.1	0	103	75 - 125	268.9	6.02	20	
Surr: 2-Fluorobiphenyl	*24.42*	*0*	*24.51*	*0*	*99.6*	*70 - 130*	*26.7*	*8.93*	*20*	
Surr: Trifluoromethyl benzene	*24.6*	*0*	*24.51*	*0*	*100*	*70 - 130*	*25.89*	*5.08*	*20*	

The following samples were analyzed in this batch: HS19051893-01

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051893

QC BATCH REPORT

Batch ID: 141603 (0) **Instrument: FID-10** **Method: PETROLEUM HYDROCARBONS BY TX1006**

MBLK Sample ID: **MBLK-141603** Units: **mg/Kg** Analysis Date: **04-Jun-2019 16:47**
Client ID: Run ID: **FID-10_339825** SeqNo: **5107321** PrepDate: **04-Jun-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aliphatics nC6	U	10								
Aliphatics >nC6 to nC8	U	10								
Aliphatics >nC8 to nC10	U	10								
Aliphatics >nC10 to nC12	U	10								
Aliphatics >nC12 to nC16	U	10								
Aliphatics >nC16 to nC21	U	10								
Aliphatics >nC21 to nC35	U	10								
Total Aliphatic Fraction	U	10								
Aliphatics Relative % Distribution	0	0								
Total Petroleum Hydrocarbons	U	10								

MBLK Sample ID: **MBLK-141603** Units: **mg/Kg** Analysis Date: **04-Jun-2019 19:12**
Client ID: Run ID: **FID-10_339828** SeqNo: **5107356** PrepDate: **04-Jun-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aromatics >nC7 to nC8	U	10								
Aromatics >nC8 to nC10	U	10								
Aromatics >nC10 to nC12	U	10								
Aromatics >nC12 to nC16	U	10								
Aromatics >nC16 to nC21	U	10								
Aromatics >nC21 to nC35	U	10								
Total Aromatic Fraction	U	10								
Aromatics Relative % Distribution	0	0								

LCS Sample ID: **LCS-141603** Units: **mg/Kg** Analysis Date: **04-Jun-2019 17:16**
Client ID: Run ID: **FID-10_339825** SeqNo: **5107322** PrepDate: **04-Jun-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Petroleum Hydrocarbons	488.5	10	500	0	97.7	60 - 140				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051893

QC BATCH REPORT

Batch ID: 141603 (0) **Instrument: FID-10** **Method: PETROLEUM HYDROCARBONS BY TX1006**

LCSD Sample ID: **LCSD-141603** Units: **mg/Kg** Analysis Date: **04-Jun-2019 17:45**
Client ID: Run ID: **FID-10_339825** SeqNo: **5107323** PrepDate: **04-Jun-2019** DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Petroleum Hydrocarbons	477.1	10	500	0	95.4	60 - 140	488.5	2.36	30	

The following samples were analyzed in this batch: HS19051893-01

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051893

QC BATCH REPORT

Batch ID: R339809 (0) **Instrument: VOA8** **Method: VOLATILES BY SW8260C**

MBLK Sample ID: **MBLKW1-060519** Units: **ug/Kg** Analysis Date: **05-Jun-2019 08:42**
Client ID: Run ID: **VOA8_339809** SeqNo: **5107050** 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								
m,p-Xylene	U	10								
o-Xylene	U	5.0								
Toluene	U	5.0								
Xylenes, Total	U	5.0								
Surr: 1,2-Dichloroethane-d4	*50.63*	*0*	*50*	*0*	*101*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*46.76*	*0*	*50*	*0*	*93.5*	*80 - 120*				
Surr: Dibromofluoromethane	*44.43*	*0*	*50*	*0*	*88.9*	*80 - 119*				
Surr: Toluene-d8	*48.73*	*0*	*50*	*0*	*97.5*	*81 - 118*				

LCS Sample ID: **VLCSW1-060519** Units: **ug/Kg** Analysis Date: **05-Jun-2019 08:17**
Client ID: Run ID: **VOA8_339809** SeqNo: **5107049** PrepDate: DF: **1**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	52.39	5.0	50	0	105	75 - 124				
Ethylbenzene	52.99	5.0	50	0	106	70 - 123				
m,p-Xylene	103.1	10	100	0	103	77 - 125				
o-Xylene	52.32	5.0	50	0	105	78 - 122				
Toluene	53.9	5.0	50	0	108	76 - 122				
Xylenes, Total	155.4	5.0	150	0	104	77 - 128				
Surr: 1,2-Dichloroethane-d4	*50.49*	*0*	*50*	*0*	*101*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*51.3*	*0*	*50*	*0*	*103*	*80 - 120*				
Surr: Dibromofluoromethane	*45.1*	*0*	*50*	*0*	*90.2*	*80 - 119*				
Surr: Toluene-d8	*50.42*	*0*	*50*	*0*	*101*	*81 - 118*				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051893

QC BATCH REPORT

Batch ID: R339809 (0) **Instrument: VOA8** **Method: VOLATILES BY SW8260C**

MS Sample ID: **HS19051517-15MS** Units: **ug/Kg** Analysis Date: **05-Jun-2019 12:02**
Client ID: Run ID: **VOA8_339809** SeqNo: **5107471** PrepDate: DF: **100**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	3505	350	3500	0	100	70 - 130				
Ethylbenzene	4772	350	3500	0	136	70 - 130				S
m,p-Xylene	7169	700	7000	0	102	70 - 130				
o-Xylene	3496	350	3500	0	99.9	70 - 130				
Toluene	4012	350	3500	0	115	70 - 130				
Xylenes, Total	10670	350	10500	0	102	70 - 130				
Surr: 1,2-Dichloroethane-d4	*3437*	*0*	*3500*	*0*	*98.2*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*3433*	*0*	*3500*	*0*	*98.1*	*70 - 130*				
Surr: Dibromofluoromethane	*2725*	*0*	*3500*	*0*	*77.9*	*70 - 130*				
Surr: Toluene-d8	*3440*	*0*	*3500*	*0*	*98.3*	*70 - 130*				

MSD Sample ID: **HS19051517-15MSD** Units: **ug/Kg** Analysis Date: **05-Jun-2019 12:27**
Client ID: Run ID: **VOA8_339809** SeqNo: **5107472** PrepDate: DF: **100**

Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	3974	350	3500	0	114	70 - 130	3505	12.5	30	
Ethylbenzene	4088	350	3500	0	117	70 - 130	4772	15.5	30	
m,p-Xylene	7932	700	7000	0	113	70 - 130	7169	10.1	30	
o-Xylene	3903	350	3500	0	112	70 - 130	3496	11	30	
Toluene	4189	350	3500	0	120	70 - 130	4012	4.31	30	
Xylenes, Total	11840	350	10500	0	113	70 - 130	10670	10.4	30	
Surr: 1,2-Dichloroethane-d4	*3531*	*0*	*3500*	*0*	*101*	*70 - 126*	*3437*	*2.72*	*30*	
Surr: 4-Bromofluorobenzene	*3448*	*0*	*3500*	*0*	*98.5*	*70 - 130*	*3433*	*0.437*	*30*	
Surr: Dibromofluoromethane	*2740*	*0*	*3500*	*0*	*78.3*	*70 - 130*	*2725*	*0.52*	*30*	
Surr: Toluene-d8	*3566*	*0*	*3500*	*0*	*102*	*70 - 130*	*3440*	*3.62*	*30*	

The following samples were analyzed in this batch: HS19051893-01

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: **HS19051893**

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
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020
Texas	TX104704231-19-23	30-Apr-2020

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Work Order: HS19051893

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19051893-01	NAPL-1620-NCS_Oil-20190524	Login	31/05/2019 16:23:41	JRM	SPA123

Sample Receipt Checklist

Client Name: PBW - Houston
Work Order: HS19051893
Date/Time Received: **31-May-2019 12:00**
Received by: **PMG**

Checklist completed by: *Paresh M. Giga* eSignature 25-May-2019 Date
Reviewed by: *Dane J. Wacasey* eSignature 4-Jun-2019 Date

Matrices: **Oil**
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:205451
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	3.6c U/c	IR25
Cooler(s)/Kit(s):	24587	
Date/Time sample(s) sent to storage:	5/24/19 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: 05/31/19: Re-log of HS19051571 for added anlaysis of BTEX, TX1005 and TX1006 per Mr. Maztner email request.

Client Contacted: Date Contacted: Person Contacted:
Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page __ of __

COC ID: 205451

ALS Project Manager:		ALS Work Order #:	

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Englewood Yard Englewo	A	~~8260_LL_W (5632528 Volatile Organics)~~ (DW 5/31/19) 8260 BTEX
Work Order		Project Number	1598-04-Rev0 SR NID__	B	8270_LOW_W (5632532 Semivolatile Organics)
Company Name	Golder Associates Inc.	Bill To Company	Union Pacific Railroad- A/P	C	RCRA 8 Waters (5652643 RCRA 8 Metals) 12 TX
Send Report To	Eric Matzner	Invoice Attn	Accounts Payable	D	~~TX1005_W_Low~~ (DW 5/31/19) (5643233 TPH TX1005) + TX1006
Address	11231 Richmond Avenue Suite D104	Address	1400 Douglas Street Stop 0750	E	RCN_W (5652638 Reactive Cyanide - RCI)
				F	RS_W (5652638 Reactive Sulfide - RCI)
City/State/Zip	Houston, TX 77082	City/State/Zip	Omaha NE 681790750	G	pH_W_9040C (5632436 pH - RCI)
Phone	(832) 916-3691	Phone	REVISED 5/31/19 (DW)	H	IGN_W (5652637 Ignitability - RCI)
Fax		Fax		I	1311_METALS_HS (5640672 5652643 TCLP RCRA 8 + 4 (TX12)
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	Oil	5.24.19	14:30	Oil	8	1	X			X	X	X	X	X	X		
2	Water	5.24.19	14:30	Water	8	9	X	X	X	X							
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

HS19051893
Golder Associates Inc.
Houston TX-Wood Preserving Works

Sampler(s) Please Print & Sign	Shipment Method	Required Turnaround Time: (Check Box)	Results Due Date:
Sarah Balke Sarah Balke	Delivery	☐ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☒ 3	

Relinquished by:	Date:	Time:	Received by:
Sarah Balke	5.24.19	16:05	
Relinquished by:	Date:	Time:	Received by (Laboratory):
	5-24-19	17:50	5/24/19 17:50
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes: UPRR Houston Englewood

Cooler ID	Cooler Temp.
	UIC
24587	3.6
	+2.1
	CF-0.6

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.