



July 31, 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 July 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 July (photographs of from the weekly inspections are 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)). However, as discussed in the April 2019 update, water has collected within the NAPL collection sumps. The water in Sump 1 was observed as being dark brown in color (no odor or observable characteristics of petroleum hydrocarbons were observed). The water in the sumps was first pumped down in May (May 9 and May 24, 2019) where some NAPL was recovered and transferred to a frac tank during the May 24th pump down. Separate samples of the water and NAPL were collected to recharacterize the recovered fluids for disposal. Analytical from the NAPL and fluids are provided in Attachment B. Based on the presence of NAPL in the recovered fluids, the recovered fluids were considered recyclable and transported to the Intergulf Corp. Facility in Pasadena, TX for recycling. Another

HAND DELIVERED



pump down of the sumps was conducted on July 25, 2019. Copies of the bill of lading for recycling of the recovered fluids from the May pump down will be provided in the next monthly update.

- None of the tar-like material seeps were noted around the NAPL Collection Systems, including the area on the south end of stall B106 along the concrete joint with the NAPL Collection System where the tar-like material had been previously noted.
- For areas outside the NAPL Collection System, very small amounts of tar-like material were noted near or within stalls 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. Approximately 2.5 gallons of the tar-like material was recovered during July.
- As discussed in the June 2019 update, areas of brown stains on the concrete pavement and evidence of seeps of a dark brown to black oily looking 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 and C-Row. Beginning in late May, 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 about weekly or every other week through July 2, 2019, when most of the water seeps had dried up or were too small to be recovered with a vacuum truck. During the weekly inspections, small amounts of the black oily looking water was noted in some cracks in the pavement and concrete with a few puddles observed near Slots A091 and A101. However, the amount of water had decreased compared to areas observed in May and June. A sample of the recovered water stored in the tote was collected on June 6, 2019 for characterization to evaluate if there are any petroleum hydrocarbons present. Total petroleum hydrocarbon (TPH) concentrations were detected at 108 mg/L (C₆-C₃₅) in the tote sample. The initial sample of the water stored in the tote had a low ignitability result (128°F), which suggested the fluids may be characteristically hazardous based on ignitability. However, a confirmation sample from the tote collected on June 26, 2019 indicated that the ignitability (>212°F) was above the hazardous criteria and the fluids were not classified as characteristically hazardous. The analytical reports for the tote samples are provided in Attachment C.

Weekly site inspections of the NAPL Collection System and Englewood Intermodal Yard concrete pavement near the collection system will continue to be conducted.

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.
Principal / Program Leader

ECM

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

Attachment NAPL Collection System Inspection Photographs -May

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ATTACHMENT A

Weekly Inspection Photolog



Client Name:
Union Pacific Railroad

Site Location:
Englewood Intermodal Yard/Houston Wood Preserving Works, 4910 Liberty Road, Houston, Texas

Project No.
19119232

Photo No.
1

Date:
07/02/19

Description:

NAPL Collection Sump at B100:
View of B099/B100 slots, looking north.



Photo No.
2

Date:
07/02/19

Description:

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





Client Name:
Union Pacific Railroad

Site Location:
Englewood Intermodal Yard/Houston Wood Preserving
Works, 4910 Liberty Road, Houston, Texas

Project No.
19119232

Photo No.
3

Date:
07/02/19

Description:

Slot B057:

View of slot B057, v.
little tar-like material in
crack in asphalt.



Photo No.
4

Date:
07/02/19

Description:

Slot B096:

View of slot B096, tar-
like material seep in
concrete joint.





Client Name:
Union Pacific Railroad

Site Location:
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Works, 4910 Liberty Road, Houston, Texas

Project No.
19119232

Photo No.
5

Date:
07/02/19

Description:

Slots B097:

View of Slot B097 and adjacent slots, looking north, brown staining along cracks in asphalt, no standing water noted.



Photo No.
6

Date:
07/02/19

Description:

Slot B102:

View of slot B102 looking north, tar-like material observed in concrete joint.





Client Name:
Union Pacific Railroad

Site Location:
Englewood Intermodal Yard/Houston Wood Preserving Works, 4910 Liberty Road, Houston, Texas

Project No.
19119232

Photo No.
7

Date:
07/02/19

Description:

Slot B105:

View of slot B105 looking north, little tar-like material seep at in asphalt crack.



Photo No.
8

Date:
07/02/19

Description:

Slot B108:

View of slot B108, tar-like material seep in asphalt crack.





Client Name:
Union Pacific Railroad

Site Location:
Englewood Intermodal Yard/Houston Wood Preserving
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Project No.
19119232

Photo No.
9

Date:
07/02/19

Description:

B099 NAPL Collection

Sump:

View of B099 Sump
note brown stained
water in the inflow
protector.



Photo No.
10

Date:
07/02/19

Description:

Slot A101:

View of slot A101,
looking north, standing
water with brown
staining.





Client Name:
Union Pacific Railroad

Site Location:
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Project No.
19119232

Photo No.
11

Date:
07/10/19

Description:

Slot A021:

View of slot A021 looking south, tar-like material seep in concrete/asphalt seam.



Photo No.
12

Date:
07/10/19

Description:

Slot B013:

View of slot B013 looking north, v. little amount of tar-like material seep in asphalt crack.





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Union Pacific Railroad

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Project No.
 19119232

Photo No.
13

Date:
 07/10/19

Description:

Slot B096:
 View of slot B096, tar-like material seep in concrete joint.



Photo No.
14

Date:
 07/10/19

Description:

Slot B096/A096:
 View of well between slot B096 and A096, looking north, brown staining along joints and asphalt cracks.





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Site Location:
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Project No.
 19119232

Photo No.
15

Date:
 07/10/19

Description:

Slot B101:

View of slot B101,
 looking east, tar-like
 material seep in asphalt
 crack.



Photo No.
16

Date:
 07/10/19

Description:

Slot B102:

View of B102, looking
 north, v. little amount
 tar-like material seep
 along seam in concrete.





Client Name:
Union Pacific Railroad

Site Location:
 Englewood Intermodal Yard/Houston Wood Preserving
 Works, 4910 Liberty Road, Houston, Texas

Project No.
 19119232

Photo No.
17

Date:
 07/10/19

Description:

Slot B101:

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



Photo No.
18

Date:
 07/10/19

Description:

B103/B104 NAPL Collection Sump:

View of B103/B104 Sump, no sheen or odor noted in the water collected in the sump.





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Project No.
19119232

Photo No.
19

Date:
07/10/19

Description:

Slot B105:

View of slot B105, tar-like material seep from crack in asphalt.



Photo No.
20

Date:
07/16/19

Description:

Slot A010:

View of slot A010, looking south, v. little tar-like material noted in the concrete joint.





Client Name:
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Site Location:
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Project No.
 19119232

Photo No.
21

Date:
 07/16/19

Description:

Slot A091:
 View of slot A091, looking west, standing dark brown water along asphalt crack, slight sheen noted, no odor noted.



Photo No.
22

Date:
 07/16/19

Description:

B099/B100 NAPL Collection Sump:
 View of B099/B100 Sump, dark brown water, no sheen and odor noted in the water collected in the sump.





Client Name:
Union Pacific Railroad

Site Location:
 Englewood Intermodal Yard/Houston Wood Preserving
 Works, 4910 Liberty Road, Houston, Texas

Project No.
 19119232

Photo No.
23

Date:
 07/16/19

Description:

Slots B080-B096:
 View of slots B080 through B096, looking west, some brown staining along asphalt cracks, no standing water but small amount of brown water noted in cracks.



Photo No.
24

Date:
 07/16/19

Description:

Slot B102:
 View of Slot B102, looking north, tar-like material seep in concrete joint.





Client Name:
Union Pacific Railroad

Site Location:
 Englewood Intermodal Yard/Houston Wood Preserving
 Works, 4910 Liberty Road, Houston, Texas

Project No.
 19119232

Photo No.
25

Date:
 07/16/19

Description:

Slot B103:

View of slot B103, very small amount of tar-like material along seam near NAPL collection system excavation.



Photo No.
26

Date:
 07/16/19

Description:

B103/B104 NAPL Collection Sump:

View of B103/B104 NAPL Collection Sump, no odor or sheen noted in the sump.





Client Name:
Union Pacific Railroad

Site Location:
Englewood Intermodal Yard/Houston Wood Preserving
Works, 4910 Liberty Road, Houston, Texas

Project No.
19119232

Photo No.
27

Date:
07/16/19

Description:

Slot B105:

View of slot B105, tar-like material along crack in asphalt.



Photo No.
28

Date:
07/16/19

Description:

Slot B108:

View of Slot B108, after removal of tar-like material from seep in asphalt cracks.





Client Name:
Union Pacific Railroad

Site Location:
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Works, 4910 Liberty Road, Houston, Texas

Project No.
19119232

Photo No.
29

Date:
07/25/19

Description:

Slot B057:

View of slot B057, looking north, little tar-like material along crack in asphalt.



Photo No.
30

Date:
07/25/19

Description:

Slots B086-B100:

View of Slots B086 through B100, some brown staining along asphalt cracks, no standing water observed.





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Works, 4910 Liberty Road, Houston, Texas

Project No.
19119232

Photo No.
31

Date:
07/25/19

Description:

Slot B096:

View of slot B096, tar-like material along crack in asphalt.



Photo No.
32

Date:
07/25/19

Description:

Slot B098:

View of Slot B098, residue noted in asphalt cracks.





Client Name:
Union Pacific Railroad

Site Location:
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Works, 4910 Liberty Road, Houston, Texas

Project No.
19119232

Photo No.
33

Date:
07/25/19

Description:

**B099/B100 NAPL
Collection Sump:**

View of the B099/B100
NAPL Collection Sump
prior to pumpdown
event, sheen and slight
odor noted.



Photo No.
34

Date:
07/25/19

Description:

**B099/B100 NAPL
Collection Sump:**

View of the B099/B100
NAPL Collection Sump
at the end of the
pumpdown event, no
NAPL noted in sump.





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 Works, 4910 Liberty Road, Houston, Texas

Project No.
 19119232

Photo No.
35

Date:
 07/25/19

Description:

Slot B101:

View of Slot B101, tar-like material seep and brown water in asphalt crack.



Photo No.
36

Date:
 07/25/19

Description:

Slot B105:

View of Slot B105, tar-like material seep in asphalt crack.





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Union Pacific Railroad

Site Location:
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Project No.
19119232

Photo No.
37

Date:
07/25/19

Description:

Slot B108:

View of Slot B108, v.
little tar-like material
seep in asphalt cracks.



Photo No.
38

Date:
07/25/19

Description:

Slots B098-B106:

View of Slots B098-
B106, looking east from
B106, NAPL collection
system excavation area
and brown staining
along asphalt cracks.



ATTACHMENT B

NAPL Collection System Recovered Fluid Analytical Reports



10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
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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.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051571

**TRRP Laboratory Data
Package Cover Page**

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: HS19051571

**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: 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 DCs 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 | <input type="checkbox"/> |
| HS19051571-02 | WSW-1620-NCS_Water-20190524 | Water | | 24-May-2019 14:30 | 24-May-2019 17:50 | <input type="checkbox"/> |

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 | MLL | 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 | MLL | 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 | MLL | 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 |
| <i>Surr: 1,2-Dichloroethane-d4</i> | <i>104</i> | | | <i>70-126</i> | <i>%REC</i> | <i>100</i> | <i>29-May-2019 07:34</i> |
| <i>Surr: 4-Bromofluorobenzene</i> | <i>93.8</i> | | | <i>81-113</i> | <i>%REC</i> | <i>100</i> | <i>29-May-2019 07:34</i> |
| <i>Surr: Dibromofluoromethane</i> | <i>102</i> | | | <i>77-123</i> | <i>%REC</i> | <i>100</i> | <i>29-May-2019 07:34</i> |
| <i>Surr: Toluene-d8</i> | <i>104</i> | | | <i>82-127</i> | <i>%REC</i> | <i>100</i> | <i>29-May-2019 07:34</i> |

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 |
| <i>Surr: 2,4,6-Tribromophenol</i> | 0 | JS | | 34-129 | %REC | 100 | 29-May-2019 22:37 |
| <i>Surr: 2-Fluorobiphenyl</i> | 0 | JS | | 40-125 | %REC | 100 | 29-May-2019 22:37 |
| <i>Surr: 2-Fluorophenol</i> | 0 | JS | | 20-120 | %REC | 100 | 29-May-2019 22:37 |
| <i>Surr: 4-Terphenyl-d14</i> | 0 | JS | | 40-135 | %REC | 100 | 29-May-2019 22:37 |
| <i>Surr: Nitrobenzene-d5</i> | 0 | JS | | 41-120 | %REC | 100 | 29-May-2019 22:37 |
| <i>Surr: Phenol-d6</i> | 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 |
| <i>Surr: 2-Fluorobiphenyl</i> | 99.7 | | | 70-130 | %REC | 1 | 30-May-2019 12:13 |
| <i>Surr: Trifluoromethyl benzene</i> | 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

| SampleID | 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

| SampleID | 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

| SampleID | 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

| SampleID | 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

| SampleID | 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

| SampleID | 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 PENSKEY-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 | | | | | | | | |
| <i>Surr: 2-Fluorobiphenyl</i> | 2.059 | 0 | 2.5 | 0 | 82.3 | 70 - 130 | | | | |
| <i>Surr: Trifluoromethyl benzene</i> | 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 | | | | |
| <i>Surr: 2-Fluorobiphenyl</i> | 2.446 | 0 | 2.5 | 0 | 97.9 | 70 - 130 | | | | |
| <i>Surr: Trifluoromethyl benzene</i> | 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 | |
| <i>Surr: 2-Fluorobiphenyl</i> | 2.572 | 0 | 2.5 | 0 | 103 | 70 - 130 | 2.446 | 4.99 | 20 | |
| <i>Surr: Trifluoromethyl benzene</i> | 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 | | | | |
| <i>Surr: 2-Fluorobiphenyl</i> | 2.389 | 0 | 2.395 | 0 | 99.7 | 70 - 130 | | | | |
| <i>Surr: Trifluoromethyl benzene</i> | 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 |
| <i>Surr: 2-Fluorobiphenyl</i> | <i>2.415</i> | <i>0</i> | <i>2.406</i> | <i>0</i> | <i>100</i> | <i>70 - 130</i> | <i>2.389</i> | <i>1.07</i> | <i>20</i> |
| <i>Surr: Trifluoromethyl benzene</i> | <i>2.409</i> | <i>0</i> | <i>2.406</i> | <i>0</i> | <i>100</i> | <i>70 - 130</i> | <i>2.452</i> | <i>1.76</i> | <i>20</i> |

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 | MLQ | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD %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 | MLQ | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD %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 | MLQ | 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 | MLQ | 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 | RPD Limit | RPD 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 | RPD Limit | RPD 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 | RPD Limit | RPD 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 | RPD Limit | RPD 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 | RPD Limit | RPD 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:

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 | SQL | 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 | MLQ | 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 | |
| <i>Surr: 4-Terphenyl-d14</i> | 5.46 | 0.20 | 5 | 0 | 109 | 40 - 135 | | | | |
| <i>Surr: Nitrobenzene-d5</i> | 4.573 | 0.20 | 5 | 0 | 91.5 | 41 - 120 | | | | |
| <i>Surr: Phenol-d6</i> | 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 | MLQ | 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 | MLQ | 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 | RPD Limit Qual | |
| <i>Surr: 4-Terphenyl-d14</i> | 5.718 | 0.20 | 5 | 0 | 114 | 40 - 135 | | | | |
| <i>Surr: Nitrobenzene-d5</i> | 4.888 | 0.20 | 5 | 0 | 97.8 | 41 - 120 | | | | |
| <i>Surr: Phenol-d6</i> | 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 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 | MLQ | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %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 | MLQ | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit Qual | |
| <i>Surr: 4-Terphenyl-d14</i> | 5.61 | 0.20 | 5 | 0 | 112 | 40 - 135 | 5.718 | 1.9 | 20 | |
| <i>Surr: Nitrobenzene-d5</i> | 4.775 | 0.20 | 5 | 0 | 95.5 | 41 - 120 | 4.888 | 2.34 | 20 | |
| <i>Surr: Phenol-d6</i> | 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 | SQL | 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 | MLQ | 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 | | | | | | | |
| <i>Surr: 1,2-Dichloroethane-d4</i> | <i>52</i> | <i>1.0</i> | <i>50</i> | <i>0</i> | <i>104</i> | <i>70 - 123</i> | | | |
| <i>Surr: 4-Bromofluorobenzene</i> | <i>49.38</i> | <i>1.0</i> | <i>50</i> | <i>0</i> | <i>98.8</i> | <i>82 - 115</i> | | | |
| <i>Surr: Dibromofluoromethane</i> | <i>51.41</i> | <i>1.0</i> | <i>50</i> | <i>0</i> | <i>103</i> | <i>73 - 126</i> | | | |
| <i>Surr: Toluene-d8</i> | <i>51.27</i> | <i>1.0</i> | <i>50</i> | <i>0</i> | <i>103</i> | <i>81 - 120</i> | | | |

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 | MLQ | 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 | MLL | 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 | | | |
| <i>Surr: 1,2-Dichloroethane-d4</i> | <i>54.89</i> | <i>1.0</i> | <i>50</i> | <i>0</i> | <i>110</i> | <i>70 - 130</i> | | | |
| <i>Surr: 4-Bromofluorobenzene</i> | <i>49.54</i> | <i>1.0</i> | <i>50</i> | <i>0</i> | <i>99.1</i> | <i>82 - 115</i> | | | |
| <i>Surr: Dibromofluoromethane</i> | <i>50.17</i> | <i>1.0</i> | <i>50</i> | <i>0</i> | <i>100</i> | <i>73 - 126</i> | | | |
| <i>Surr: Toluene-d8</i> | <i>52.01</i> | <i>1.0</i> | <i>50</i> | <i>0</i> | <i>104</i> | <i>81 - 120</i> | | | |

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 | | | |
| <i>Surr: 1,2-Dichloroethane-d4</i> | <i>53.21</i> | <i>1.0</i> | <i>50</i> | <i>0</i> | <i>106</i> | <i>70 - 126</i> | | | |
| <i>Surr: 4-Bromofluorobenzene</i> | <i>49.95</i> | <i>1.0</i> | <i>50</i> | <i>0</i> | <i>99.9</i> | <i>81 - 113</i> | | | |
| <i>Surr: Dibromofluoromethane</i> | <i>49.99</i> | <i>1.0</i> | <i>50</i> | <i>0</i> | <i>100.0</i> | <i>77 - 123</i> | | | |
| <i>Surr: Toluene-d8</i> | <i>50.81</i> | <i>1.0</i> | <i>50</i> | <i>0</i> | <i>102</i> | <i>82 - 127</i> | | | |

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 | MLQ | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %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 | MLQ | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %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 | |
| <i>Surr: 1,2-Dichloroethane-d4</i> | 53.4 | 1.0 | 50 | 0 | 107 | 70 - 126 | 53.21 | 0.35 | 20 | |
| <i>Surr: 4-Bromofluorobenzene</i> | 49.28 | 1.0 | 50 | 0 | 98.6 | 81 - 113 | 49.95 | 1.35 | 20 | |
| <i>Surr: Dibromofluoromethane</i> | 50.09 | 1.0 | 50 | 0 | 100 | 77 - 123 | 49.99 | 0.191 | 20 | |
| <i>Surr: Toluene-d8</i> | 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:

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:

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 | MLQ | 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:

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:

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 Quantitation 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
Date: 25-May-2019

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

Matrices: Oil/Water

Carrier name: Client

- Shipping container/cooler in good condition? Yes [checked] No [] Not Present []
Custody seals intact on shipping container/cooler? Yes [] No [] Not Present [checked]
Custody seals intact on sample bottles? Yes [] No [] Not Present [checked]
VOA/TX1005/TX1006 Solids in hermetically sealed vials? Yes [] No [] Not Present [checked]
Chain of custody present? Yes [checked] No []
Chain of custody signed when relinquished and received? Yes [checked] No []
Samplers name present on COC? Yes [checked] No []
Chain of custody agrees with sample labels? Yes [checked] No []
Samples in proper container/bottle? Yes [checked] No []
Sample containers intact? Yes [checked] No []
Sufficient sample volume for indicated test? Yes [checked] No []
All samples received within holding time? Yes [checked] No []
Container/Temp Blank temperature in compliance? Yes [checked] No []

1 Page(s)
COC IDs:205451

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 [checked] No [] No VOA vials submitted []
Water - pH acceptable upon receipt? Yes [checked] No [] N/A []
pH adjusted? Yes [] No [checked] N/A []
pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:



Cincinnati, OH
+1 513 733 5336

Everett, WA
+1 425 356 2600

Fort Collins, CO
+1 970 490 1511

Holland, MI
+1 616 399 6070

Chain of Custody Form

Page 1 of 1

COC ID: 205451

Houston, TX
+1 281 530 5656

Middletown, PA
+1 717 944 5541

Spring City, PA
+1 610 948 4903

Salt Lake City, UT
+1 801 266 7700

South Charleston, WV
+1 304 356 3168

York, PA
+1 717 505 5280

| 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 & Waters (5652643 RCRA Metals) (12 TX) | | | | | | | | | | |
| Send Report To | Eric Matzner | Invoice Attn | Accounts Payable | D | TX1005_W_Low (5643233 TPH TX1005) | | | | | | | | | | |
| Address | 11231 Richmond Avenue | Address | 1400 Douglas Street | E | RCN_W (5652638 Reactive Cyanide - RCI) | | | | | | | | | | |
| | Suite D104 | | Stop 0750 | 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 8F4) (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.
Houston TX-Englewood Yard Englewood Modular Office



| | | | | | | | | | | | |
|--|------------------|------------------------------------|--|---|--------------|--|--|-------------------|--|--|--|
| Sampler(s) Please Print & Sign <i>Sarah Balke</i> | | Shipment Method <i>Delivery</i> | | Required Turnaround Time: (Check Box) <input checked="" type="checkbox"/> 3 <input type="checkbox"/> STD 10 Wk Days <input type="checkbox"/> 5 Wk Days <input type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hour | | | | Results Due Date: | | | |
| Relinquished by: <i>Sue Balke</i> | Date: 5-24-19 | Time: 16:05 | Received by: <i>RB</i> | Notes: UPRR Houston Englewood | | | | | | | |
| Relinquished by: <i>RB</i> | Date: 5-24-19 | Time: 17:50 | Received by (Laboratory): <i>RB</i> | Cooler ID | Cooler Temp. | QC Package: (Check One Box Below) | | | | | |
| Logged by (Laboratory): | Date: | Time: | Checked by (Laboratory): | 24587 | 3.60 | <input type="checkbox"/> Level II Std QC | <input checked="" type="checkbox"/> TRRP Checklist | | | | |
| Preservative Key: 1-HCl 2-HNO ₃ 3-H ₂ SO ₄ 4-NaOH 5-Na ₂ S ₂ O ₃ 6-NaHSO ₄ 7-Other 8-4°C 9-5035 | | | | | | <input type="checkbox"/> Level III Std QC/Raw Data | <input type="checkbox"/> TRRP Level IV | | | | |
| | | | | | | <input type="checkbox"/> Level IV SW846/CLP | | | | | |
| | | | | | | <input type="checkbox"/> Other | | | | | |

- 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.

Copyright 2011 by ALS Environmental.



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.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19051893

**TRRP Laboratory Data
Package Cover Page**

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 effects 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. | |
| <p>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).</p> | | |

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 | HS1905157 1-01 A | 24-May-2019 14:30 | 31-May-2019 12:00 | <input type="checkbox"/> |

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 | MLL | 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

| SamplID | 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

| SamplID | 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

| SamplID | 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 | 5000 0 |

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 | PHCG6ALIP | 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 | RPD Limit Qual | |
| nC6 to nC12 | U | 50 | | | | | | | | |
| >nC12 to nC28 | U | 50 | | | | | | | | |
| >nC28 to nC35 | U | 50 | | | | | | | | |
| Total Petroleum Hydrocarbon | U | 50 | | | | | | | | |
| <i>Surr: 2-Fluorobiphenyl</i> | 22.82 | 0 | 25 | 0 | 91.3 | 70 - 130 | | | | |
| <i>Surr: Trifluoromethyl benzene</i> | 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 | 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 | | | | |
| <i>Surr: 2-Fluorobiphenyl</i> | 23.45 | 0 | 25 | 0 | 93.8 | 70 - 130 | | | | |
| <i>Surr: Trifluoromethyl benzene</i> | 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 | 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 | |
| <i>Surr: 2-Fluorobiphenyl</i> | 25.23 | 0 | 25 | 0 | 101 | 70 - 130 | 23.45 | 7.3 | 20 | |
| <i>Surr: Trifluoromethyl benzene</i> | 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 | 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 | | | | |
| <i>Surr: 2-Fluorobiphenyl</i> | 26.7 | 0 | 24.15 | 0 | 111 | 70 - 130 | | | | |
| <i>Surr: Trifluoromethyl benzene</i> | 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 |
| <i>Surr: 2-Fluorobiphenyl</i> | 24.42 | 0 | 24.51 | 0 | 99.6 | 70 - 130 | 26.7 | 8.93 | 20 |
| <i>Surr: Trifluoromethyl benzene</i> | 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 | MLQ | 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 | MLQ | 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 | MLQ | 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 | MLQ | 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 | MLQ | 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 | | | | | | | |
| <i>Surr: 1,2-Dichloroethane-d4</i> | <i>50.63</i> | <i>0</i> | <i>50</i> | <i>0</i> | <i>101</i> | <i>76 - 125</i> | | | |
| <i>Surr: 4-Bromofluorobenzene</i> | <i>46.76</i> | <i>0</i> | <i>50</i> | <i>0</i> | <i>93.5</i> | <i>80 - 120</i> | | | |
| <i>Surr: Dibromofluoromethane</i> | <i>44.43</i> | <i>0</i> | <i>50</i> | <i>0</i> | <i>88.9</i> | <i>80 - 119</i> | | | |
| <i>Surr: Toluene-d8</i> | <i>48.73</i> | <i>0</i> | <i>50</i> | <i>0</i> | <i>97.5</i> | <i>81 - 118</i> | | | |

| 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 | MLQ | 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 | | | |
| <i>Surr: 1,2-Dichloroethane-d4</i> | <i>50.49</i> | <i>0</i> | <i>50</i> | <i>0</i> | <i>101</i> | <i>76 - 125</i> | | | |
| <i>Surr: 4-Bromofluorobenzene</i> | <i>51.3</i> | <i>0</i> | <i>50</i> | <i>0</i> | <i>103</i> | <i>80 - 120</i> | | | |
| <i>Surr: Dibromofluoromethane</i> | <i>45.1</i> | <i>0</i> | <i>50</i> | <i>0</i> | <i>90.2</i> | <i>80 - 119</i> | | | |
| <i>Surr: Toluene-d8</i> | <i>50.42</i> | <i>0</i> | <i>50</i> | <i>0</i> | <i>101</i> | <i>81 - 118</i> | | | |

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 | MLQ | 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 | | | | |
| <i>Surr: 1,2-Dichloroethane-d4</i> | <i>3437</i> | <i>0</i> | <i>3500</i> | <i>0</i> | <i>98.2</i> | <i>70 - 126</i> | | | | |
| <i>Surr: 4-Bromofluorobenzene</i> | <i>3433</i> | <i>0</i> | <i>3500</i> | <i>0</i> | <i>98.1</i> | <i>70 - 130</i> | | | | |
| <i>Surr: Dibromofluoromethane</i> | <i>2725</i> | <i>0</i> | <i>3500</i> | <i>0</i> | <i>77.9</i> | <i>70 - 130</i> | | | | |
| <i>Surr: Toluene-d8</i> | <i>3440</i> | <i>0</i> | <i>3500</i> | <i>0</i> | <i>98.3</i> | <i>70 - 130</i> | | | | |

| MSD | | | | | | | | | | |
|------------------------------------|-------------|------------------------------------|-------------|------------------------------|-----------------------|-----------------|---|--------------|----------------|------|
| Sample ID: HS19051517-15MSD | | | | | | | | | | |
| Instrument: VOA8 | | | | Method: VOLATILES BY SW8260C | | | | | | |
| 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 | MLQ | 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 | |
| <i>Surr: 1,2-Dichloroethane-d4</i> | <i>3531</i> | <i>0</i> | <i>3500</i> | <i>0</i> | <i>101</i> | <i>70 - 126</i> | <i>3437</i> | <i>2.72</i> | <i>30</i> | |
| <i>Surr: 4-Bromofluorobenzene</i> | <i>3448</i> | <i>0</i> | <i>3500</i> | <i>0</i> | <i>98.5</i> | <i>70 - 130</i> | <i>3433</i> | <i>0.437</i> | <i>30</i> | |
| <i>Surr: Dibromofluoromethane</i> | <i>2740</i> | <i>0</i> | <i>3500</i> | <i>0</i> | <i>78.3</i> | <i>70 - 130</i> | <i>2725</i> | <i>0.52</i> | <i>30</i> | |
| <i>Surr: Toluene-d8</i> | <i>3566</i> | <i>0</i> | <i>3500</i> | <i>0</i> | <i>102</i> | <i>70 - 130</i> | <i>3440</i> | <i>3.62</i> | <i>30</i> | |

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 Quantitation 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
Date: 25-May-2019

Reviewed by: Dane J. Wacasey
eSignature
Date: 4-Jun-2019

Matrices: Oil

Carrier name: Client

- Shipping container/cooler in good condition? Yes [checked] No [] Not Present []
Custody seals intact on shipping container/cooler? Yes [] No [] Not Present [checked]
Custody seals intact on sample bottles? Yes [] No [] Not Present [checked]
VOA/TX1005/TX1006 Solids in hermetically sealed vials? Yes [] No [] Not Present [checked]
Chain of custody present? Yes [checked] No []
Chain of custody signed when relinquished and received? Yes [checked] No []
Samplers name present on COC? Yes [checked] No []
Chain of custody agrees with sample labels? Yes [checked] No []
Samples in proper container/bottle? Yes [checked] No []
Sample containers intact? Yes [checked] No []
Sufficient sample volume for indicated test? Yes [checked] No []
All samples received within holding time? Yes [checked] No []
Container/Temp Blank temperature in compliance? Yes [checked] 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 [checked] No [] No VOA vials submitted []
Water - pH acceptable upon receipt? Yes [] No [] N/A [checked]
pH adjusted? Yes [] No [checked] N/A []

pH adjusted by:

Login Notes: 05/31/19: Re-log of HS19051571 for added anlysis 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

Chain of Custody Form

Houston, TX
+1 281 530 5656

Spring City, PA
+1 610 948 4903

South Charleston, WV
+1 304 356 3168

Everett, WA
+1 425 356 2600

Holland, MI
+1 616 399 6070

Page 1 of 1

Middletown, PA
+1 717 944 5541

Salt Lake City, UT
+1 801 266 7700

York, PA
+1 717 505 5280

COC ID: 205451

| | | | | | | | |
|----------------------|-------------------------|---------------------|-----------------------------------|----------------------|--|-------------------|--|
| Customer Information | | Project Information | | ALS Project Manager: | | ALS Work Order #: | |
| Purchase Order | UPRR/Kevin Peterburs | Project Name | Houston TX-Englewood Yard Englewo | A | 8260_LL_W (5632528 Volatile Organics) | 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 Metals) | 8/12 TX | |
| Send Report To | Eric Matzner | Invoice Attn | Accounts Payable | D | TX1005_W_Low (5643233 TPH TX1005) | TX1006 | |
| Address | 11231 Richmond Avenue | Address | 1400 Douglas Street | E | RCN_W (5652638 Reactive Cyanide - RCI) | | |
| | Suite D104 | | Stop 0750 | 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 8/4) | TX12 | |
| e-Mail Address | Eric_Matzner@golder.com | e-Mail Address | | J | | | |

REVISED
5/31/19 (DW)

| 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 | | | |
| 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 <i>Sarah Balke</i> | | Shipment Method <i>Delivery</i> | | Required Turnaround Time: (Check Box) <input checked="" type="checkbox"/> 3 <input type="checkbox"/> STD 10 Wk Days <input type="checkbox"/> 5 Wk Days <input type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hour | | Results Due Date: | |
| Relinquished by: <i>Sarah Balke</i> | Date: 5-24-19 | Time: 16:05 | Received by: <i>RB</i> | Notes: UPRR Houston Englewood | | | |
| Relinquished by: <i>RB</i> | Date: 5-24-19 | Time: 17:50 | Received by (Laboratory): <i>RB</i> | Cooler ID 24587 | Cooler Temp. 3.60 | QC Package: (Check One Box Below) | |
| Logged by (Laboratory): <i>RB</i> | Date: | Time: | Checked by (Laboratory): | | | <input type="checkbox"/> Level II Std QC | <input checked="" type="checkbox"/> TRRP Checklist |
| Preservative Key: 1-HCl 2-HNO ₃ 3-H ₂ SO ₄ 4-NaOH 5-Na ₂ S ₂ O ₃ 6-NaHSO ₄ 7-Other 8-4°C 9-5035 | | | | | | <input type="checkbox"/> Level III Sirt QC/Raw Data | <input type="checkbox"/> TRRP Level IV |
| | | | | | | <input type="checkbox"/> Level IV SW846/CLP | |
| | | | | | | <input type="checkbox"/> Other | |

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

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ATTACHMENT C

Tote Water Analytical Reports



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

June 14, 2019

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

Work Order: **HS19060363**

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

Dear Eric,

ALS Environmental received 1 sample(s) on Jun 06, 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.
Project: Houston TX-Wood Preserving Works IDWW
Work Order: HS19060363

SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---------------|----------------------------|--------|-------|-------------------|-------------------|--------------------------|
| HS19060363-01 | WW-1620-ToteWater-20190606 | Water | | 06-Jun-2019 11:00 | 06-Jun-2019 13:40 | <input type="checkbox"/> |

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works IDWW
Work Order: HS19060363

CASE NARRATIVE**Work Order Comments**

- 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 °C.
-

GC Semivolatiles by Method TX1005**Batch ID: 141892****Sample ID: HS19060422-02MSD**

- MSD performed on an unrelated sample.
-

GCMS Semivolatiles by Method SW8270**Batch ID: 141877****Sample ID: WW-1620-ToteWater-20190606 (HS19060363-01)**

- The GCMS semi-volatile extract of this sample was run at a dilution due to a high level of matrix interference.
-

GCMS Volatiles by Method SW8260**Batch ID: R340491****Sample ID: WW-1620-ToteWater-20190606 (HS19060363-01)**

- Lowest practical dilution for sample HS19060363-01 due to a high level of matrix interference.
-

Metals by Method SW7470**Batch ID: 141843**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
-

Metals by Method SW6020**Batch ID: 141816****Sample ID: HS19060190-03MS**

- MS and MSD performed on an unrelated sample.

Sample ID: WW-1620-ToteWater-20190606 (HS19060363-01)

- Dilution due to high concentration of Sodium.
-

WetChemistry by Method SW1010**Batch ID: R340447**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
-

WetChemistry by Method SW9040C**Batch ID: R340325**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
-

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works IDWW
Work Order: HS19060363

CASE NARRATIVE

WetChemistry by Method SM4500 S2-F

Batch ID: R340220

Sample ID: HS19060333-02MS

- MS performed on an unrelated sample.

WetChemistry by Method SW9014

Batch ID: 141976

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
-

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works IDWW
 Sample ID: WW-1620-ToteWater-20190606
 Collection Date: 06-Jun-2019 11:00

ANALYTICAL REPORT
 WorkOrder:HS19060363
 Lab ID:HS19060363-01
 Matrix:Water

| ANALYSES | RESULT | QUAL | REPORT LIMIT | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---------------------------------------|-------------|----------------------|--------------|-------------|-----------------|-------------------|
| LOW LEVEL VOLATILES BY SW8260C | | Method:SW8260 | | | | Analyst: PC |
| Benzene | < 0.25 | | 0.25 | mg/L | 250 | 14-Jun-2019 08:02 |
| Ethylbenzene | < 0.25 | | 0.25 | mg/L | 250 | 14-Jun-2019 08:02 |
| Toluene | < 0.25 | | 0.25 | mg/L | 250 | 14-Jun-2019 08:02 |
| Xylenes, Total | 0.47 | | 0.25 | mg/L | 250 | 14-Jun-2019 08:02 |
| <i>Surr: 1,2-Dichloroethane-d4</i> | 100 | | 70-126 | %REC | 250 | 14-Jun-2019 08:02 |
| <i>Surr: 4-Bromofluorobenzene</i> | 95.2 | | 81-113 | %REC | 250 | 14-Jun-2019 08:02 |
| <i>Surr: Dibromofluoromethane</i> | 103 | | 77-123 | %REC | 250 | 14-Jun-2019 08:02 |
| <i>Surr: Toluene-d8</i> | 98.4 | | 82-127 | %REC | 250 | 14-Jun-2019 08:02 |

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

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works IDWW
 Sample ID: WW-1620-ToteWater-20190606
 Collection Date: 06-Jun-2019 11:00

ANALYTICAL REPORT
 WorkOrder:HS19060363
 Lab ID:HS19060363-01
 Matrix:Water

| ANALYSES | RESULT | QUAL | REPORT LIMIT | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---------------|----------------------|---------------|-------------|---------------------------|-------------------|
| LOW-LEVEL SEMIVOLATILES BY 8270D | | Method:SW8270 | | | Prep:SW3510 / 11-Jun-2019 | Analyst: GEY |
| 1,2,4-Trichlorobenzene | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| 2,4,5-Trichlorophenol | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| 2,4,6-Trichlorophenol | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| 2,4-Dichlorophenol | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| 2,4-Dimethylphenol | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| 2,4-Dinitrophenol | < 0.010 | | 0.010 | mg/L | 10 | 14-Jun-2019 14:38 |
| 2,4-Dinitrotoluene | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| 2,6-Dinitrotoluene | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| 2-Chloronaphthalene | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| 2-Chlorophenol | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| 2-Methylnaphthalene | 0.031 | | 0.0010 | mg/L | 10 | 14-Jun-2019 14:38 |
| 2-Methylphenol | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| 2-Nitroaniline | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| 2-Nitrophenol | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| 3&4-Methylphenol | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| 3,3'-Dichlorobenzidine | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| 3-Nitroaniline | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| 4,6-Dinitro-2-methylphenol | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| 4-Bromophenyl phenyl ether | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| 4-Chloro-3-methylphenol | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| 4-Chloroaniline | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| 4-Chlorophenyl phenyl ether | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| 4-Nitroaniline | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| 4-Nitrophenol | < 0.010 | | 0.010 | mg/L | 10 | 14-Jun-2019 14:38 |
| Acenaphthene | < 0.0010 | | 0.0010 | mg/L | 10 | 14-Jun-2019 14:38 |
| Acenaphthylene | < 0.0010 | | 0.0010 | mg/L | 10 | 14-Jun-2019 14:38 |
| Anthracene | < 0.0010 | | 0.0010 | mg/L | 10 | 14-Jun-2019 14:38 |
| Benz(a)anthracene | < 0.0010 | | 0.0010 | mg/L | 10 | 14-Jun-2019 14:38 |
| Benzidine | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| Benzo(a)pyrene | < 0.0010 | | 0.0010 | mg/L | 10 | 14-Jun-2019 14:38 |
| Benzo(b)fluoranthene | < 0.0010 | | 0.0010 | mg/L | 10 | 14-Jun-2019 14:38 |
| Benzo(g,h,i)perylene | < 0.0010 | | 0.0010 | mg/L | 10 | 14-Jun-2019 14:38 |
| Benzo(k)fluoranthene | < 0.0010 | | 0.0010 | mg/L | 10 | 14-Jun-2019 14:38 |
| Benzyl alcohol | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| Bis(2-chloroethoxy)methane | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| Bis(2-chloroethyl)ether | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| Bis(2-chloroisopropyl)ether | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| Bis(2-ethylhexyl)phthalate | 0.0056 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| Butyl benzyl phthalate | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |

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

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works IDWW
 Sample ID: WW-1620-ToteWater-20190606
 Collection Date: 06-Jun-2019 11:00

ANALYTICAL REPORT
 WorkOrder:HS19060363
 Lab ID:HS19060363-01
 Matrix:Water

| ANALYSES | RESULT | QUAL | REPORT LIMIT | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---------------|----------------------|---------------|-----------------------------|-----------------|-------------------|
| LOW-LEVEL SEMIVOLATILES BY 8270D | | Method:SW8270 | | Prep:SW3510 / 11-Jun-2019 | | Analyst: GEY |
| Carbazole | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| Chrysene | < 0.0010 | | 0.0010 | mg/L | 10 | 14-Jun-2019 14:38 |
| Di-n-butyl phthalate | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| Di-n-octyl phthalate | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| Dibenz(a,h)anthracene | < 0.0010 | | 0.0010 | mg/L | 10 | 14-Jun-2019 14:38 |
| Dibenzofuran | < 0.0010 | | 0.0010 | mg/L | 10 | 14-Jun-2019 14:38 |
| Diethyl phthalate | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| Dimethyl phthalate | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| Fluoranthene | < 0.0010 | | 0.0010 | mg/L | 10 | 14-Jun-2019 14:38 |
| Fluorene | 0.0015 | | 0.0010 | mg/L | 10 | 14-Jun-2019 14:38 |
| Hexachlorobenzene | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| Hexachlorobutadiene | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| Hexachlorocyclopentadiene | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| Hexachloroethane | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| Indeno(1,2,3-cd)pyrene | < 0.0010 | | 0.0010 | mg/L | 10 | 14-Jun-2019 14:38 |
| Isophorone | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| N-Nitrosodi-n-propylamine | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| N-Nitrosodimethylamine | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| N-Nitrosodiphenylamine | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| Naphthalene | 0.016 | | 0.0010 | mg/L | 10 | 14-Jun-2019 14:38 |
| Nitrobenzene | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| Pentachlorophenol | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| Phenanthrene | 0.0034 | | 0.0010 | mg/L | 10 | 14-Jun-2019 14:38 |
| Phenol | < 0.0020 | | 0.0020 | mg/L | 10 | 14-Jun-2019 14:38 |
| Pyrene | < 0.0010 | | 0.0010 | mg/L | 10 | 14-Jun-2019 14:38 |
| Pyridine | < 0.010 | | 0.010 | mg/L | 10 | 14-Jun-2019 14:38 |
| <i>Surr: 2,4,6-Tribromophenol</i> | 45.2 | | 34-129 | %REC | 10 | 14-Jun-2019 14:38 |
| <i>Surr: 2-Fluorobiphenyl</i> | 59.3 | | 40-125 | %REC | 10 | 14-Jun-2019 14:38 |
| <i>Surr: 2-Fluorophenol</i> | 50.2 | | 20-120 | %REC | 10 | 14-Jun-2019 14:38 |
| <i>Surr: 4-Terphenyl-d14</i> | 90.0 | | 40-135 | %REC | 10 | 14-Jun-2019 14:38 |
| <i>Surr: Nitrobenzene-d5</i> | 82.2 | | 41-120 | %REC | 10 | 14-Jun-2019 14:38 |
| <i>Surr: Phenol-d6</i> | 47.5 | | 20-120 | %REC | 10 | 14-Jun-2019 14:38 |
| LOW-LEVEL TEXAS TPH BY TX1005 | | Method:TX1005 | | Prep:TX1005PR / 11-Jun-2019 | | Analyst: MBG |
| nC6 to nC12 | 22 | | 0.49 | mg/L | 1 | 12-Jun-2019 22:53 |
| >nC12 to nC28 | 75 | | 0.49 | mg/L | 1 | 12-Jun-2019 22:53 |
| >nC28 to nC35 | 11 | | 0.49 | mg/L | 1 | 12-Jun-2019 22:53 |
| Total Petroleum Hydrocarbon | 108 | | 0.49 | mg/L | 1 | 12-Jun-2019 22:53 |
| <i>Surr: 2-Fluorobiphenyl</i> | 91.0 | | 70-130 | %REC | 1 | 12-Jun-2019 22:53 |
| <i>Surr: Trifluoromethyl benzene</i> | 70.9 | | 70-130 | %REC | 1 | 12-Jun-2019 22:53 |

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

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works IDWW
 Sample ID: WW-1620-ToteWater-20190606
 Collection Date: 06-Jun-2019 11:00

ANALYTICAL REPORT
 WorkOrder:HS19060363
 Lab ID:HS19060363-01
 Matrix:Water

| ANALYSES | RESULT | QUAL | REPORT LIMIT | UNITS | DILUTION FACTOR | DATE ANALYZED |
|--|------------|---------------------------|--------------|----------------------------|-----------------|-------------------|
| ICP-MS METALS BY SW6020A | | Method:SW6020 | | Prep:SW3010A / 10-Jun-2019 | | Analyst: JHD |
| Arsenic | 0.894 | | 0.0100 | mg/L | 5 | 11-Jun-2019 13:17 |
| Barium | 0.608 | | 0.0200 | mg/L | 5 | 11-Jun-2019 13:17 |
| Cadmium | < 0.0100 | | 0.0100 | mg/L | 5 | 11-Jun-2019 13:17 |
| Chromium | 0.352 | | 0.0200 | mg/L | 5 | 11-Jun-2019 13:17 |
| Lead | 0.336 | | 0.0100 | mg/L | 5 | 11-Jun-2019 13:17 |
| Selenium | 0.0143 | | 0.0100 | mg/L | 5 | 11-Jun-2019 13:17 |
| Silver | 0.0152 | | 0.0100 | mg/L | 5 | 11-Jun-2019 13:17 |
| MERCURY BY SW7470A | | Method:SW7470 | | Prep:SW7470 / 10-Jun-2019 | | Analyst: FO |
| Mercury | < 0.000200 | | 0.000200 | mg/L | 1 | 10-Jun-2019 15:34 |
| SULFIDE BY SM4500 S2-F | | Method:SM4500 S2-F | | | | Analyst: RG |
| Sulfide | 12.8 | | 1.00 | mg/L | 1 | 10-Jun-2019 11:45 |
| FLASH POINT BY PENSKY-MARTENS SW1010A | | Method:SW1010 | | | | Analyst: KAH |
| Ignitability | 128 | | 70.0 | °F | 1 | 13-Jun-2019 14:00 |
| CYANIDE - SW9014 | | Method:SW9014 | | Prep:SW9010C / 12-Jun-2019 | | Analyst: MZD |
| Cyanide | 0.0680 | | 0.0200 | mg/L | 1 | 13-Jun-2019 09:10 |
| PH BY SW9040C | | Method:SW9040C | | | | Analyst: KMU |
| pH | 9.96 | H | 0.100 | pH Units | 1 | 12-Jun-2019 12:00 |
| Temp Deg C @pH | 22.3 | H | 0 | DEG C | 1 | 12-Jun-2019 12:00 |

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

WEIGHT LOG

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works IDWW
WorkOrder: HS19060363

Batch ID: 141816 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

| SampID | Container | Sample Wt/Vol | Final Volume | Prep Factor |
|---------------|-----------|---------------|--------------|-------------|
| HS19060363-01 | 1 | 10 | 10 (mL) | 1 |

Batch ID: 141843 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

| SampID | Container | Sample Wt/Vol | Final Volume | Prep Factor |
|---------------|-----------|---------------|--------------|-------------|
| HS19060363-01 | 1 | 10 (mL) | 10 (mL) | 1 |

Batch ID: 141877 **Method:** LOW-LEVEL SEMIVOLATILES BY 8270D **Prep:** 3510_B_LOW

| SampID | Container | Sample Wt/Vol | Final Volume | Prep Factor |
|---------------|-----------|---------------|--------------|-------------|
| HS19060363-01 | 1 | 990 | 1 (mL) | 0.00101 |

Batch ID: 141892 **Method:** LOW-LEVEL TEXAS TPH BY TX1005 **Prep:** TX 1005_W PR

| SampID | Container | Sample Wt/Vol | Final Volume | Prep Factor |
|---------------|-----------|---------------|--------------|-------------|
| HS19060363-01 | 1 | 30.62 | 3 (mL) | 0.09798 |

Batch ID: 141976 **Method:** CYANIDE - SW9014 **Prep:** CN_TW_PR

| SampID | Container | Sample Wt/Vol | Final Volume | Prep Factor |
|---------------|-----------|---------------|--------------|-------------|
| HS19060363-01 | 1 | 50 | 50 (mL) | 1 |

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works IDWW
WorkOrder: HS19060363

DATES REPORT

| Sample ID | Client Samp ID | Collection Date | TCLP Date | Prep Date | Analysis Date | DF |
|-------------------------|---|-------------------|----------------------|-------------------|-------------------|-----|
| Batch ID 141816 | Test Name : ICP-MS METALS BY SW6020A | | Matrix: Water | | | |
| HS19060363-01 | WW-1620-ToteWater-20190606 | 06 Jun 2019 11:00 | | 10 Jun 2019 10:00 | 11 Jun 2019 13:17 | 5 |
| Batch ID 141843 | Test Name : MERCURY BY SW7470A | | Matrix: Water | | | |
| HS19060363-01 | WW-1620-ToteWater-20190606 | 06 Jun 2019 11:00 | | 10 Jun 2019 10:30 | 10 Jun 2019 15:34 | 1 |
| Batch ID 141877 | Test Name : LOW-LEVEL SEMIVOLATILES BY 8270D | | Matrix: Water | | | |
| HS19060363-01 | WW-1620-ToteWater-20190606 | 06 Jun 2019 11:00 | | 11 Jun 2019 11:25 | 14 Jun 2019 14:38 | 10 |
| Batch ID 141892 | Test Name : LOW-LEVEL TEXAS TPH BY TX1005 | | Matrix: Water | | | |
| HS19060363-01 | WW-1620-ToteWater-20190606 | 06 Jun 2019 11:00 | | 11 Jun 2019 09:30 | 12 Jun 2019 22:53 | 1 |
| Batch ID 141976 | Test Name : CYANIDE - SW9014 | | Matrix: Water | | | |
| HS19060363-01 | WW-1620-ToteWater-20190606 | 06 Jun 2019 11:00 | | 12 Jun 2019 13:30 | 13 Jun 2019 09:10 | 1 |
| Batch ID R340220 | Test Name : SULFIDE BY SM4500 S2-F | | Matrix: Water | | | |
| HS19060363-01 | WW-1620-ToteWater-20190606 | 06 Jun 2019 11:00 | | | 10 Jun 2019 11:45 | 1 |
| Batch ID R340325 | Test Name : PH BY SW9040C | | Matrix: Water | | | |
| HS19060363-01 | WW-1620-ToteWater-20190606 | 06 Jun 2019 11:00 | | | 12 Jun 2019 12:00 | 1 |
| Batch ID R340447 | Test Name : FLASH POINT BY PENSKEY-MARTENS SW1010A | | Matrix: Water | | | |
| HS19060363-01 | WW-1620-ToteWater-20190606 | 06 Jun 2019 11:00 | | | 13 Jun 2019 14:00 | 1 |
| Batch ID R340491 | Test Name : LOW LEVEL VOLATILES BY SW8260C | | Matrix: Water | | | |
| HS19060363-01 | WW-1620-ToteWater-20190606 | 06 Jun 2019 11:00 | | | 14 Jun 2019 08:02 | 250 |

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works IDWW
WorkOrder: HS19060363

QC BATCH REPORT

| | | |
|-------------------------------|---------------------------|--|
| Batch ID: 141892 (0) | Instrument: FID-10 | Method: LOW-LEVEL TEXAS TPH BY TX1005 |
|-------------------------------|---------------------------|--|

| MBLK | Sample ID: MBLK-141892 | Units: mg/L | Analysis Date: 12-Jun-2019 16:38 | | | | | | | |
|-------------------------------|-------------------------------|-----------------------|---|---------------|------|---------------|---------------|------|-----------|------|
| Client ID: | Run ID: FID-10_340391 | SeqNo: 5119869 | PrepDate: 11-Jun-2019 | DF: 1 | | | | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
| nC6 to nC12 | < 0.50 | 0.50 | | | | | | | | |
| >nC12 to nC28 | < 0.50 | 0.50 | | | | | | | | |
| >nC28 to nC35 | < 0.50 | 0.50 | | | | | | | | |
| Total Petroleum Hydrocarbon | < 0.50 | 0.50 | | | | | | | | |
| Surr: 2-Fluorobiphenyl | 2.431 | 0 | 2.5 | 0 | 97.2 | 70 - 130 | | | | |
| Surr: Trifluoromethyl benzene | 2.741 | 0 | 2.5 | 0 | 110 | 70 - 130 | | | | |

| LCS | Sample ID: LCS-141892 | Units: mg/L | Analysis Date: 12-Jun-2019 17:06 | | | | | | | |
|-------------------------------|------------------------------|-----------------------|---|---------------|------|---------------|---------------|------|-----------|------|
| Client ID: | Run ID: FID-10_340391 | SeqNo: 5119870 | PrepDate: 11-Jun-2019 | DF: 1 | | | | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
| nC6 to nC12 | 26.48 | 0.50 | 25 | 0 | 106 | 75 - 125 | | | | |
| >nC12 to nC28 | 20.76 | 0.50 | 25 | 0 | 83.0 | 75 - 125 | | | | |
| Surr: 2-Fluorobiphenyl | 2.678 | 0 | 2.5 | 0 | 107 | 70 - 130 | | | | |
| Surr: Trifluoromethyl benzene | 2.522 | 0 | 2.5 | 0 | 101 | 70 - 130 | | | | |

| LCSD | Sample ID: LCSD-141892 | Units: mg/L | Analysis Date: 12-Jun-2019 17:35 | | | | | | | |
|-------------------------------|-------------------------------|-----------------------|---|---------------|------|---------------|---------------|-------|-----------|------|
| Client ID: | Run ID: FID-10_340391 | SeqNo: 5119871 | PrepDate: 11-Jun-2019 | DF: 1 | | | | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
| nC6 to nC12 | 27.35 | 0.50 | 25 | 0 | 109 | 75 - 125 | 26.48 | 3.22 | 20 | |
| >nC12 to nC28 | 21.26 | 0.50 | 25 | 0 | 85.1 | 75 - 125 | 20.76 | 2.42 | 20 | |
| Surr: 2-Fluorobiphenyl | 2.755 | 0 | 2.5 | 0 | 110 | 70 - 130 | 2.678 | 2.82 | 20 | |
| Surr: Trifluoromethyl benzene | 2.543 | 0 | 2.5 | 0 | 102 | 70 - 130 | 2.522 | 0.844 | 20 | |

| MS | Sample ID: HS19060422-02MS | Units: mg/L | Analysis Date: 12-Jun-2019 18:33 | | | | | | | |
|-------------------------------|-----------------------------------|-----------------------|---|---------------|------|---------------|---------------|------|-----------|------|
| Client ID: | Run ID: FID-10_340391 | SeqNo: 5119873 | PrepDate: 11-Jun-2019 | DF: 1 | | | | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
| nC6 to nC12 | 28.77 | 0.49 | 24.67 | 0 | 117 | 75 - 125 | | | | |
| >nC12 to nC28 | 32.88 | 0.49 | 24.67 | 13.8 | 77.3 | 75 - 125 | | | | |
| Surr: 2-Fluorobiphenyl | 2.19 | 0 | 2.467 | 0 | 88.8 | 70 - 130 | | | | |
| Surr: Trifluoromethyl benzene | 2.549 | 0 | 2.467 | 0 | 103 | 70 - 130 | | | | |

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works IDWW
WorkOrder: HS19060363

QC BATCH REPORT

Batch ID: 141892 (0) **Instrument:** FID-10 **Method:** LOW-LEVEL TEXAS TPH BY TX1005

| MSD | | Sample ID: HS19060422-02MSD | | | Units: mg/L | | Analysis Date: 12-Jun-2019 19:02 | | | |
|--------------------------------------|--------|------------------------------------|---------|---------------|-----------------------|---------------|---|------|--------------|------|
| Client ID: | | Run ID: FID-10_340391 | | | SeqNo: 5119874 | | PrepDate: 11-Jun-2019 | | DF: 1 | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
| nC6 to nC12 | 25.73 | 0.49 | 24.41 | 0 | 105 | 75 - 125 | 28.77 | 11.2 | 20 | |
| >nC12 to nC28 | 30.25 | 0.49 | 24.41 | 13.8 | 67.4 | 75 - 125 | 32.88 | 8.35 | 20 | S |
| <i>Surr: 2-Fluorobiphenyl</i> | 2.527 | 0 | 2.441 | 0 | 103 | 70 - 130 | 2.19 | 14.3 | 20 | |
| <i>Surr: Trifluoromethyl benzene</i> | 2.492 | 0 | 2.441 | 0 | 102 | 70 - 130 | 2.549 | 2.28 | 20 | |

The following samples were analyzed in this batch: HS19060363-01

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works IDWW
WorkOrder: HS19060363

QC BATCH REPORT

Batch ID: 141816 (0) **Instrument:** ICPMS06 **Method:** ICP-MS METALS BY SW6020A

| MBLK | | Sample ID: MBLKF1-141816 | | | Units: mg/L | | Analysis Date: 10-Jun-2019 23:26 | | | |
|-------------|-----------|---------------------------------|---------|---------------|-----------------------|---------------|---|------|--------------|------|
| Client ID: | | Run ID: ICPMS06_340137 | | | SeqNo: 5115572 | | PrepDate: 10-Jun-2019 | | DF: 1 | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
| Arsenic | < 0.00200 | 0.00200 | | | | | | | | |
| Barium | < 0.00400 | 0.00400 | | | | | | | | |
| Cadmium | < 0.00200 | 0.00200 | | | | | | | | |
| Chromium | < 0.00400 | 0.00400 | | | | | | | | |
| Lead | < 0.00200 | 0.00200 | | | | | | | | |
| Selenium | < 0.00200 | 0.00200 | | | | | | | | |
| Silver | < 0.00200 | 0.00200 | | | | | | | | |

| MBLK | | Sample ID: MBLK-141816 | | | Units: mg/L | | Analysis Date: 10-Jun-2019 23:24 | | | |
|-------------|-----------|-------------------------------|---------|---------------|-----------------------|---------------|---|------|--------------|------|
| Client ID: | | Run ID: ICPMS06_340137 | | | SeqNo: 5115571 | | PrepDate: 10-Jun-2019 | | DF: 1 | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
| Arsenic | < 0.00200 | 0.00200 | | | | | | | | |
| Barium | < 0.00400 | 0.00400 | | | | | | | | |
| Cadmium | < 0.00200 | 0.00200 | | | | | | | | |
| Chromium | < 0.00400 | 0.00400 | | | | | | | | |
| Lead | < 0.00200 | 0.00200 | | | | | | | | |
| Selenium | < 0.00200 | 0.00200 | | | | | | | | |
| Silver | < 0.00200 | 0.00200 | | | | | | | | |

| LCS | | Sample ID: LCS-141816 | | | Units: mg/L | | Analysis Date: 10-Jun-2019 23:28 | | | |
|------------|---------|-------------------------------|---------|---------------|-----------------------|---------------|---|------|--------------|------|
| Client ID: | | Run ID: ICPMS06_340137 | | | SeqNo: 5115573 | | PrepDate: 10-Jun-2019 | | DF: 1 | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
| Arsenic | 0.04876 | 0.00200 | 0.05 | 0 | 97.5 | 80 - 120 | | | | |
| Barium | 0.04856 | 0.00400 | 0.05 | 0 | 97.1 | 80 - 120 | | | | |
| Cadmium | 0.04965 | 0.00200 | 0.05 | 0 | 99.3 | 80 - 120 | | | | |
| Chromium | 0.04711 | 0.00400 | 0.05 | 0 | 94.2 | 80 - 120 | | | | |
| Lead | 0.04792 | 0.00200 | 0.05 | 0 | 95.8 | 80 - 120 | | | | |
| Selenium | 0.05163 | 0.00200 | 0.05 | 0 | 103 | 80 - 120 | | | | |
| Silver | 0.04865 | 0.00200 | 0.05 | 0 | 97.3 | 80 - 120 | | | | |

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works IDWW
WorkOrder: HS19060363

QC BATCH REPORT

| Batch ID: 141816 (0) | | Instrument: ICPMS06 | | | Method: ICP-MS METALS BY SW6020A | | | | | |
|------------------------|---------|------------------------------------|---------|---------------|----------------------------------|---------------|---|------|--------------|------|
| MS | | Sample ID: HS19060190-03MS | | | Units: mg/L | | Analysis Date: 11-Jun-2019 13:35 | | | |
| Client ID: | | Run ID: ICPMS06_340236 | | | SeqNo: 5116777 | | PrepDate: 10-Jun-2019 | | DF: 5 | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
| Arsenic | 0.05389 | 0.0100 | 0.05 | 0.003749 | 100 | 80 - 120 | | | | |
| Barium | 0.9511 | 0.0200 | 0.05 | 0.936 | 30.1 | 80 - 120 | | | | SO |
| Cadmium | 0.0495 | 0.0100 | 0.05 | 0.000032 | 98.9 | 80 - 120 | | | | |
| Chromium | 0.04758 | 0.0200 | 0.05 | -0.000229 | 95.6 | 80 - 120 | | | | |
| Lead | 0.0494 | 0.0100 | 0.05 | 0.000088 | 98.6 | 80 - 120 | | | | |
| Selenium | 0.05124 | 0.0100 | 0.05 | 0.002589 | 97.3 | 80 - 120 | | | | |
| Silver | 0.04941 | 0.0100 | 0.05 | 0.000021 | 98.8 | 80 - 120 | | | | |
| MSD | | Sample ID: HS19060190-03MSD | | | Units: mg/L | | Analysis Date: 11-Jun-2019 13:37 | | | |
| Client ID: | | Run ID: ICPMS06_340236 | | | SeqNo: 5116778 | | PrepDate: 10-Jun-2019 | | DF: 5 | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
| Arsenic | 0.05468 | 0.0100 | 0.05 | 0.003749 | 102 | 80 - 120 | 0.05389 | 1.45 | 20 | |
| Barium | 0.9286 | 0.0200 | 0.05 | 0.936 | -14.8 | 80 - 120 | 0.9511 | 2.39 | 20 | SO |
| Cadmium | 0.0458 | 0.0100 | 0.05 | 0.000032 | 91.5 | 80 - 120 | 0.0495 | 7.76 | 20 | |
| Chromium | 0.04978 | 0.0200 | 0.05 | -0.000229 | 100 | 80 - 120 | 0.04758 | 4.52 | 20 | |
| Lead | 0.04844 | 0.0100 | 0.05 | 0.000088 | 96.7 | 80 - 120 | 0.0494 | 1.95 | 20 | |
| Selenium | 0.05355 | 0.0100 | 0.05 | 0.002589 | 102 | 80 - 120 | 0.05124 | 4.4 | 20 | |
| Silver | 0.0483 | 0.0100 | 0.05 | 0.000021 | 96.6 | 80 - 120 | 0.04941 | 2.26 | 20 | |
| PDS | | Sample ID: HS19060190-03PDS | | | Units: mg/L | | Analysis Date: 11-Jun-2019 13:39 | | | |
| Client ID: | | Run ID: ICPMS06_340236 | | | SeqNo: 5116779 | | PrepDate: 10-Jun-2019 | | DF: 5 | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
| Arsenic | 0.4822 | 0.0100 | 0.5 | 0.003749 | 95.7 | 75 - 125 | | | | |
| Barium | 1.334 | 0.0200 | 0.5 | 0.936 | 79.6 | 75 - 125 | | | | |
| Cadmium | 0.4625 | 0.0100 | 0.5 | 0 | 92.5 | 75 - 125 | | | | |
| Chromium | 0.4754 | 0.0200 | 0.5 | 0 | 95.1 | 75 - 125 | | | | |
| Lead | 0.4745 | 0.0100 | 0.5 | 0 | 94.9 | 75 - 125 | | | | |
| Selenium | 0.4611 | 0.0100 | 0.5 | 0 | 92.2 | 75 - 125 | | | | |
| Silver | 0.4787 | 0.0100 | 0.5 | 0 | 95.7 | 75 - 125 | | | | |

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works IDWW
WorkOrder: HS19060363

QC BATCH REPORT

| Batch ID: 141816 (0) | | Instrument: ICPMS06 | | Method: ICP-MS METALS BY SW6020A | | | | | | |
|------------------------|-----------------------------------|-----------------------|------------------------------|---|------|---------------|---------------|------|-------|------|
| SD | Sample ID: HS19060190-03SD | Units: mg/L | | Analysis Date: 11-Jun-2019 13:34 | | | | | | |
| Client ID: | Run ID: ICPMS06_340236 | SeqNo: 5116776 | PrepDate: 10-Jun-2019 | DF: 25 | | | | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %D | Limit | Qual |
| Arsenic | 0.01081 | 0.0500 | | | | | 0.003749 | 0 | 10 | J |
| Barium | 0.9171 | 0.100 | | | | | 0.936 | 2.03 | 10 | |
| Cadmium | < 0.0500 | 0.0500 | | | | | 0.000032 | 0 | 10 | |
| Chromium | < 0.100 | 0.100 | | | | | -0.000229 | 0 | 10 | |
| Lead | < 0.0500 | 0.0500 | | | | | 0.000088 | 0 | 10 | |
| Selenium | < 0.0500 | 0.0500 | | | | | 0.002589 | 0 | 10 | |
| Silver | < 0.0500 | 0.0500 | | | | | 0.000021 | 0 | 10 | |

The following samples were analyzed in this batch: HS19060363-01

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works IDWW
WorkOrder: HS19060363

QC BATCH REPORT

| | | |
|-------------------------------|-------------------------|-----------------------------------|
| Batch ID: 141843 (0) | Instrument: HG03 | Method: MERCURY BY SW7470A |
|-------------------------------|-------------------------|-----------------------------------|

| | | | | | | | | | | |
|-------------|-------------------------------|-----------------------|---|---------------|------|---------------|---------------|----------|-----------|----------|
| MBLK | Sample ID: MBLK-141843 | Units: mg/L | Analysis Date: 10-Jun-2019 14:55 | | | | | | | |
| Client ID: | Run ID: HG03_340167 | SeqNo: 5114696 | PrepDate: 10-Jun-2019 DF: 1 | | | | | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD %RPD | RPD Limit | RPD Qual |

Mercury < 0.000200 0.000200

| | | | | | | | | | | |
|------------|------------------------------|-----------------------|---|---------------|------|---------------|---------------|----------|-----------|----------|
| LCS | Sample ID: LCS-141843 | Units: mg/L | Analysis Date: 10-Jun-2019 14:57 | | | | | | | |
| Client ID: | Run ID: HG03_340167 | SeqNo: 5114697 | PrepDate: 10-Jun-2019 DF: 1 | | | | | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD %RPD | RPD Limit | RPD Qual |

Mercury 0.00516 0.000200 0.005 0 103 80 - 120

| | | | | | | | | | | |
|------------|-----------------------------------|-----------------------|---|---------------|------|---------------|---------------|----------|-----------|----------|
| MS | Sample ID: HS19060190-03MS | Units: mg/L | Analysis Date: 10-Jun-2019 15:00 | | | | | | | |
| Client ID: | Run ID: HG03_340167 | SeqNo: 5114699 | PrepDate: 10-Jun-2019 DF: 1 | | | | | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD %RPD | RPD Limit | RPD Qual |

Mercury 0.00503 0.000200 0.005 0.00003 100 75 - 125

| | | | | | | | | | | |
|------------|------------------------------------|-----------------------|---|---------------|------|---------------|---------------|----------|-----------|----------|
| MSD | Sample ID: HS19060190-03MSD | Units: mg/L | Analysis Date: 10-Jun-2019 15:02 | | | | | | | |
| Client ID: | Run ID: HG03_340167 | SeqNo: 5114700 | PrepDate: 10-Jun-2019 DF: 1 | | | | | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD %RPD | RPD Limit | RPD Qual |

Mercury 0.00499 0.000200 0.005 0.00003 99.2 75 - 125 0.00503 0.798 20

The following samples were analyzed in this batch: HS19060363-01

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works IDWW
WorkOrder: HS19060363

QC BATCH REPORT

| Batch ID: 141877 (0) | | Instrument: SV-7 | | Method: LOW-LEVEL SEMIVOLATILES BY 8270D | | | | | | |
|-----------------------------|------------------------|------------------|-----------------------|--|----------------------------------|---------------|---------------|------|-----------|------|
| MBLK | Sample ID: MBLK-141877 | Units: ug/L | | | Analysis Date: 11-Jun-2019 14:44 | | | | | |
| Client ID: | Run ID: SV-7_340239 | SeqNo: 5116734 | PrepDate: 11-Jun-2019 | DF: 1 | | | | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
| 1,2,4-Trichlorobenzene | < 0.20 | 0.20 | | | | | | | | |
| 2,4,5-Trichlorophenol | < 0.20 | 0.20 | | | | | | | | |
| 2,4,6-Trichlorophenol | < 0.20 | 0.20 | | | | | | | | |
| 2,4-Dichlorophenol | < 0.20 | 0.20 | | | | | | | | |
| 2,4-Dimethylphenol | < 0.20 | 0.20 | | | | | | | | |
| 2,4-Dinitrophenol | < 1.0 | 1.0 | | | | | | | | |
| 2,4-Dinitrotoluene | < 0.20 | 0.20 | | | | | | | | |
| 2,6-Dinitrotoluene | < 0.20 | 0.20 | | | | | | | | |
| 2-Chloronaphthalene | < 0.20 | 0.20 | | | | | | | | |
| 2-Chlorophenol | < 0.20 | 0.20 | | | | | | | | |
| 2-Methylnaphthalene | < 0.10 | 0.10 | | | | | | | | |
| 2-Methylphenol | < 0.20 | 0.20 | | | | | | | | |
| 2-Nitroaniline | < 0.20 | 0.20 | | | | | | | | |
| 2-Nitrophenol | < 0.20 | 0.20 | | | | | | | | |
| 3&4-Methylphenol | < 0.20 | 0.20 | | | | | | | | |
| 3,3'-Dichlorobenzidine | < 0.20 | 0.20 | | | | | | | | |
| 3-Nitroaniline | < 0.20 | 0.20 | | | | | | | | |
| 4,6-Dinitro-2-methylphenol | < 0.20 | 0.20 | | | | | | | | |
| 4-Bromophenyl phenyl ether | < 0.20 | 0.20 | | | | | | | | |
| 4-Chloro-3-methylphenol | < 0.20 | 0.20 | | | | | | | | |
| 4-Chloroaniline | < 0.20 | 0.20 | | | | | | | | |
| 4-Chlorophenyl phenyl ether | < 0.20 | 0.20 | | | | | | | | |
| 4-Nitroaniline | < 0.20 | 0.20 | | | | | | | | |
| 4-Nitrophenol | < 1.0 | 1.0 | | | | | | | | |
| Acenaphthene | < 0.10 | 0.10 | | | | | | | | |
| Acenaphthylene | < 0.10 | 0.10 | | | | | | | | |
| Anthracene | < 0.10 | 0.10 | | | | | | | | |
| Benz(a)anthracene | < 0.10 | 0.10 | | | | | | | | |
| Benzo(a)pyrene | < 0.10 | 0.10 | | | | | | | | |
| Benzo(b)fluoranthene | < 0.10 | 0.10 | | | | | | | | |
| Benzo(g,h,i)perylene | < 0.10 | 0.10 | | | | | | | | |
| Benzo(k)fluoranthene | < 0.10 | 0.10 | | | | | | | | |
| Benzyl alcohol | < 0.20 | 0.20 | | | | | | | | |
| Bis(2-chloroethoxy)methane | < 0.20 | 0.20 | | | | | | | | |

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works IDWW
WorkOrder: HS19060363

QC BATCH REPORT

| Batch ID: 141877 (0) | | Instrument: SV-7 | | Method: LOW-LEVEL SEMIVOLATILES BY 8270D | | | | | | |
|-----------------------------|------------------------|------------------|-----------------------|--|----------------------------------|---------------|---------------|------|-----------|------|
| MBLK | Sample ID: MBLK-141877 | Units: ug/L | | | Analysis Date: 11-Jun-2019 14:44 | | | | | |
| Client ID: | Run ID: SV-7_340239 | SeqNo: 5116734 | PrepDate: 11-Jun-2019 | DF: 1 | | | | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
| Bis(2-chloroethyl)ether | < 0.20 | 0.20 | | | | | | | | |
| Bis(2-chloroisopropyl)ether | < 0.20 | 0.20 | | | | | | | | |
| Bis(2-ethylhexyl)phthalate | < 0.20 | 0.20 | | | | | | | | |
| Butyl benzyl phthalate | < 0.20 | 0.20 | | | | | | | | |
| Carbazole | < 0.20 | 0.20 | | | | | | | | |
| Chrysene | < 0.10 | 0.10 | | | | | | | | |
| Dibenz(a,h)anthracene | < 0.10 | 0.10 | | | | | | | | |
| Dibenzofuran | < 0.10 | 0.10 | | | | | | | | |
| Diethyl phthalate | < 0.20 | 0.20 | | | | | | | | |
| Dimethyl phthalate | < 0.20 | 0.20 | | | | | | | | |
| Di-n-butyl phthalate | < 0.20 | 0.20 | | | | | | | | |
| Di-n-octyl phthalate | < 0.20 | 0.20 | | | | | | | | |
| Fluoranthene | < 0.10 | 0.10 | | | | | | | | |
| Fluorene | < 0.10 | 0.10 | | | | | | | | |
| Hexachlorobenzene | < 0.20 | 0.20 | | | | | | | | |
| Hexachlorobutadiene | < 0.20 | 0.20 | | | | | | | | |
| Hexachlorocyclopentadiene | < 0.20 | 0.20 | | | | | | | | |
| Hexachloroethane | < 0.20 | 0.20 | | | | | | | | |
| Indeno(1,2,3-cd)pyrene | < 0.10 | 0.10 | | | | | | | | |
| Isophorone | < 0.20 | 0.20 | | | | | | | | |
| Naphthalene | < 0.10 | 0.10 | | | | | | | | |
| Nitrobenzene | < 0.20 | 0.20 | | | | | | | | |
| N-Nitrosodimethylamine | < 0.20 | 0.20 | | | | | | | | |
| N-Nitrosodi-n-propylamine | < 0.20 | 0.20 | | | | | | | | |
| N-Nitrosodiphenylamine | < 0.20 | 0.20 | | | | | | | | |
| Pentachlorophenol | < 0.20 | 0.20 | | | | | | | | |
| Phenanthrene | < 0.10 | 0.10 | | | | | | | | |
| Phenol | < 0.20 | 0.20 | | | | | | | | |
| Pyrene | < 0.10 | 0.10 | | | | | | | | |
| Pyridine | < 1.0 | 1.0 | | | | | | | | |
| Surr: 2,4,6-Tribromophenol | 3.856 | 0.20 | 5 | 0 | 77.1 | 34 - 129 | | | | |
| Surr: 2-Fluorobiphenyl | 4.416 | 0.20 | 5 | 0 | 88.3 | 40 - 125 | | | | |
| Surr: 2-Fluorophenol | 3.783 | 0.20 | 5 | 0 | 75.7 | 20 - 120 | | | | |
| Surr: 4-Terphenyl-d14 | 4.591 | 0.20 | 5 | 0 | 91.8 | 40 - 135 | | | | |

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works IDWW
WorkOrder: HS19060363

QC BATCH REPORT

Batch ID: 141877 (0) **Instrument:** SV-7 **Method:** LOW-LEVEL SEMIVOLATILES BY 8270D

| | | | | | | | | | |
|-------------|-------------------------------|-----------------------|---------|------------------------------|---|---------------|---------------|----------|----------------|
| MBLK | Sample ID: MBLK-141877 | Units: ug/L | | | Analysis Date: 11-Jun-2019 14:44 | | | | |
| Client ID: | Run ID: SV-7_340239 | SeqNo: 5116734 | | PrepDate: 11-Jun-2019 | | DF: 1 | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD %RPD | RPD Limit Qual |

| | | | | | | | | | |
|------------------------------|-------|------|---|---|------|----------|--|--|--|
| <i>Surr: Nitrobenzene-d5</i> | 4.106 | 0.20 | 5 | 0 | 82.1 | 41 - 120 | | | |
| <i>Surr: Phenol-d6</i> | 3.818 | 0.20 | 5 | 0 | 76.4 | 20 - 120 | | | |

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works IDWW
WorkOrder: HS19060363

QC BATCH REPORT

| Batch ID: 141877 (0) | | Instrument: SV-7 | | Method: LOW-LEVEL SEMIVOLATILES BY 8270D | | | | | | |
|-----------------------------|-----------------------|------------------|---------|--|----------------------------------|---------------|---------------|------|-----------|------|
| LCS | Sample ID: LCS-141877 | Units: ug/L | | | Analysis Date: 11-Jun-2019 13:08 | | | | | |
| Client ID: | Run ID: SV-7_340239 | SeqNo: 5116730 | | PrepDate: 11-Jun-2019 | | DF: 1 | | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
| 1,2,4-Trichlorobenzene | 4.673 | 0.20 | 5 | 0 | 93.5 | 45 - 120 | | | | |
| 2,4,5-Trichlorophenol | 5.052 | 0.20 | 5 | 0 | 101 | 46 - 120 | | | | |
| 2,4,6-Trichlorophenol | 4.805 | 0.20 | 5 | 0 | 96.1 | 42 - 120 | | | | |
| 2,4-Dichlorophenol | 4.873 | 0.20 | 5 | 0 | 97.5 | 49 - 120 | | | | |
| 2,4-Dimethylphenol | 4.611 | 0.20 | 5 | 0 | 92.2 | 35 - 120 | | | | |
| 2,4-Dinitrophenol | 4.151 | 1.0 | 5 | 0 | 83.0 | 15 - 120 | | | | |
| 2,4-Dinitrotoluene | 4.791 | 0.20 | 5 | 0 | 95.8 | 50 - 122 | | | | |
| 2,6-Dinitrotoluene | 5.024 | 0.20 | 5 | 0 | 100 | 50 - 120 | | | | |
| 2-Chloronaphthalene | 4.938 | 0.20 | 5 | 0 | 98.8 | 50 - 120 | | | | |
| 2-Chlorophenol | 4.765 | 0.20 | 5 | 0 | 95.3 | 40 - 120 | | | | |
| 2-Methylnaphthalene | 4.805 | 0.10 | 5 | 0 | 96.1 | 50 - 120 | | | | |
| 2-Methylphenol | 4.818 | 0.20 | 5 | 0 | 96.4 | 45 - 120 | | | | |
| 2-Nitroaniline | 4.54 | 0.20 | 5 | 0 | 90.8 | 28 - 139 | | | | |
| 2-Nitrophenol | 5.102 | 0.20 | 5 | 0 | 102 | 40 - 120 | | | | |
| 3&4-Methylphenol | 4.605 | 0.20 | 5 | 0 | 92.1 | 35 - 120 | | | | |
| 3,3'-Dichlorobenzidine | 5.549 | 0.20 | 5 | 0 | 111 | 15 - 120 | | | | |
| 3-Nitroaniline | 4.379 | 0.20 | 5 | 0 | 87.6 | 30 - 120 | | | | |
| 4,6-Dinitro-2-methylphenol | 4.283 | 0.20 | 5 | 0 | 85.7 | 25 - 121 | | | | |
| 4-Bromophenyl phenyl ether | 4.788 | 0.20 | 5 | 0 | 95.8 | 45 - 120 | | | | |
| 4-Chloro-3-methylphenol | 4.889 | 0.20 | 5 | 0 | 97.8 | 47 - 120 | | | | |
| 4-Chloroaniline | 4.601 | 0.20 | 5 | 0 | 92.0 | 20 - 120 | | | | |
| 4-Chlorophenyl phenyl ether | 4.94 | 0.20 | 5 | 0 | 98.8 | 50 - 120 | | | | |
| 4-Nitroaniline | 4.449 | 0.20 | 5 | 0 | 89.0 | 30 - 133 | | | | |
| 4-Nitrophenol | 4.844 | 1.0 | 5 | 0 | 96.9 | 30 - 130 | | | | |
| Acenaphthene | 4.383 | 0.10 | 5 | 0 | 87.7 | 45 - 120 | | | | |
| Acenaphthylene | 4.571 | 0.10 | 5 | 0 | 91.4 | 47 - 120 | | | | |
| Anthracene | 4.874 | 0.10 | 5 | 0 | 97.5 | 45 - 120 | | | | |
| Benz(a)anthracene | 4.888 | 0.10 | 5 | 0 | 97.8 | 40 - 120 | | | | |
| Benzidine | 4.452 | 0.20 | 5 | 0 | 89.0 | 10 - 120 | | | | |
| Benzo(a)pyrene | 5.533 | 0.10 | 5 | 0 | 111 | 45 - 120 | | | | |
| Benzo(b)fluoranthene | 5.996 | 0.10 | 5 | 0 | 120 | 50 - 120 | | | | |
| Benzo(g,h,i)perylene | 4.992 | 0.10 | 5 | 0 | 99.8 | 42 - 127 | | | | |
| Benzo(k)fluoranthene | 5.301 | 0.10 | 5 | 0 | 106 | 45 - 127 | | | | |
| Benzyl alcohol | 4.534 | 0.20 | 5 | 0 | 90.7 | 35 - 122 | | | | |

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works IDWW
WorkOrder: HS19060363

QC BATCH REPORT

| Batch ID: 141877 (0) | | Instrument: SV-7 | | Method: LOW-LEVEL SEMIVOLATILES BY 8270D | | | | | | |
|-----------------------------|-----------------------|------------------|---------|--|----------------------------------|---------------|---------------|------|-----------|------|
| LCS | Sample ID: LCS-141877 | Units: ug/L | | | Analysis Date: 11-Jun-2019 13:08 | | | | | |
| Client ID: | Run ID: SV-7_340239 | SeqNo: 5116730 | | PrepDate: 11-Jun-2019 | | DF: 1 | | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
| Bis(2-chloroethoxy)methane | 4.397 | 0.20 | 5 | 0 | 87.9 | 45 - 120 | | | | |
| Bis(2-chloroethyl)ether | 5.238 | 0.20 | 5 | 0 | 105 | 37 - 121 | | | | |
| Bis(2-chloroisopropyl)ether | 4.152 | 0.20 | 5 | 0 | 83.0 | 40 - 120 | | | | |
| Bis(2-ethylhexyl)phthalate | 5.317 | 0.20 | 5 | 0 | 106 | 40 - 139 | | | | |
| Butyl benzyl phthalate | 5.2 | 0.20 | 5 | 0 | 104 | 47 - 123 | | | | |
| Carbazole | 3.54 | 0.20 | 5 | 0 | 70.8 | 42 - 128 | | | | |
| Chrysene | 4.957 | 0.10 | 5 | 0 | 99.1 | 43 - 120 | | | | |
| Dibenz(a,h)anthracene | 5.67 | 0.10 | 5 | 0 | 113 | 45 - 125 | | | | |
| Dibenzofuran | 4.857 | 0.10 | 5 | 0 | 97.1 | 50 - 120 | | | | |
| Diethyl phthalate | 4.78 | 0.20 | 5 | 0 | 95.6 | 41 - 120 | | | | |
| Dimethyl phthalate | 4.767 | 0.20 | 5 | 0 | 95.3 | 40 - 122 | | | | |
| Di-n-butyl phthalate | 5.08 | 0.20 | 5 | 0 | 102 | 45 - 123 | | | | |
| Di-n-octyl phthalate | 5.713 | 0.20 | 5 | 0 | 114 | 45 - 129 | | | | |
| Fluoranthene | 5.1 | 0.10 | 5 | 0 | 102 | 45 - 125 | | | | |
| Fluorene | 4.919 | 0.10 | 5 | 0 | 98.4 | 49 - 120 | | | | |
| Hexachlorobenzene | 4.477 | 0.20 | 5 | 0 | 89.5 | 48 - 120 | | | | |
| Hexachlorobutadiene | 4.698 | 0.20 | 5 | 0 | 94.0 | 40 - 120 | | | | |
| Hexachlorocyclopentadiene | 2.956 | 0.20 | 5 | 0 | 59.1 | 34 - 136 | | | | |
| Hexachloroethane | 4.522 | 0.20 | 5 | 0 | 90.4 | 40 - 120 | | | | |
| Indeno(1,2,3-cd)pyrene | 5.17 | 0.10 | 5 | 0 | 103 | 41 - 128 | | | | |
| Isophorone | 4.218 | 0.20 | 5 | 0 | 84.4 | 40 - 121 | | | | |
| Naphthalene | 4.552 | 0.10 | 5 | 0 | 91.0 | 45 - 120 | | | | |
| Nitrobenzene | 3.994 | 0.20 | 5 | 0 | 79.9 | 44 - 120 | | | | |
| N-Nitrosodimethylamine | 3.622 | 0.20 | 5 | 0 | 72.4 | 30 - 121 | | | | |
| N-Nitrosodi-n-propylamine | 4.227 | 0.20 | 5 | 0 | 84.5 | 40 - 120 | | | | |
| N-Nitrosodiphenylamine | 4.61 | 0.20 | 5 | 0 | 92.2 | 40 - 125 | | | | |
| Pentachlorophenol | 3.321 | 0.20 | 5 | 0 | 66.4 | 19 - 121 | | | | |
| Phenanthrene | 4.646 | 0.10 | 5 | 0 | 92.9 | 45 - 121 | | | | |
| Phenol | 4.847 | 0.20 | 5 | 0 | 96.9 | 20 - 124 | | | | |
| Pyrene | 5.066 | 0.10 | 5 | 0 | 101 | 40 - 130 | | | | |
| Pyridine | 3.853 | 1.0 | 5 | 0 | 77.1 | 15 - 120 | | | | |
| Surr: 2,4,6-Tribromophenol | 4.778 | 0.20 | 5 | 0 | 95.6 | 34 - 129 | | | | |
| Surr: 2-Fluorobiphenyl | 4.715 | 0.20 | 5 | 0 | 94.3 | 40 - 125 | | | | |
| Surr: 2-Fluorophenol | 4.166 | 0.20 | 5 | 0 | 83.3 | 20 - 120 | | | | |

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works IDWW
WorkOrder: HS19060363

QC BATCH REPORT

| Batch ID: 141877 (0) | | Instrument: SV-7 | | Method: LOW-LEVEL SEMIVOLATILES BY 8270D | | | | | | |
|------------------------------|------------------------------|-----------------------|---------|--|---|---------------|---------------|----------|----------------|--|
| LCS | Sample ID: LCS-141877 | Units: ug/L | | | Analysis Date: 11-Jun-2019 13:08 | | | | | |
| Client ID: | Run ID: SV-7_340239 | SeqNo: 5116730 | | PrepDate: 11-Jun-2019 | | DF: 1 | | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD %RPD | RPD Limit Qual | |
| <i>Surr: 4-Terphenyl-d14</i> | 4.833 | 0.20 | 5 | 0 | 96.7 | 40 - 135 | | | | |
| <i>Surr: Nitrobenzene-d5</i> | 3.993 | 0.20 | 5 | 0 | 79.9 | 41 - 120 | | | | |
| <i>Surr: Phenol-d6</i> | 4.379 | 0.20 | 5 | 0 | 87.6 | 20 - 120 | | | | |

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works IDWW
WorkOrder: HS19060363

QC BATCH REPORT

| Batch ID: 141877 (0) | | Instrument: SV-7 | | Method: LOW-LEVEL SEMIVOLATILES BY 8270D | | | | | | |
|-----------------------------|--------|------------------------|---------|--|------|----------------------------------|---------------|-------|-----------|------|
| LCSD | | Sample ID: LCSD-141877 | | Units: ug/L | | Analysis Date: 11-Jun-2019 13:28 | | | | |
| Client ID: | | Run ID: SV-7_340239 | | SeqNo: 5116731 | | PrepDate: 11-Jun-2019 | | DF: 1 | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
| 1,2,4-Trichlorobenzene | 4.726 | 0.20 | 5 | 0 | 94.5 | 45 - 120 | 4.673 | 1.13 | 20 | |
| 2,4,5-Trichlorophenol | 5.162 | 0.20 | 5 | 0 | 103 | 46 - 120 | 5.052 | 2.15 | 20 | |
| 2,4,6-Trichlorophenol | 4.822 | 0.20 | 5 | 0 | 96.4 | 42 - 120 | 4.805 | 0.351 | 20 | |
| 2,4-Dichlorophenol | 4.905 | 0.20 | 5 | 0 | 98.1 | 49 - 120 | 4.873 | 0.65 | 20 | |
| 2,4-Dimethylphenol | 4.632 | 0.20 | 5 | 0 | 92.6 | 35 - 120 | 4.611 | 0.446 | 20 | |
| 2,4-Dinitrophenol | 4.129 | 1.0 | 5 | 0 | 82.6 | 15 - 120 | 4.151 | 0.544 | 50 | |
| 2,4-Dinitrotoluene | 4.988 | 0.20 | 5 | 0 | 99.8 | 50 - 122 | 4.791 | 4.02 | 20 | |
| 2,6-Dinitrotoluene | 4.943 | 0.20 | 5 | 0 | 98.9 | 50 - 120 | 5.024 | 1.62 | 20 | |
| 2-Chloronaphthalene | 4.72 | 0.20 | 5 | 0 | 94.4 | 50 - 120 | 4.938 | 4.5 | 20 | |
| 2-Chlorophenol | 4.498 | 0.20 | 5 | 0 | 90.0 | 40 - 120 | 4.765 | 5.76 | 20 | |
| 2-Methylnaphthalene | 4.746 | 0.10 | 5 | 0 | 94.9 | 50 - 120 | 4.805 | 1.24 | 20 | |
| 2-Methylphenol | 4.666 | 0.20 | 5 | 0 | 93.3 | 45 - 120 | 4.818 | 3.2 | 20 | |
| 2-Nitroaniline | 4.382 | 0.20 | 5 | 0 | 87.6 | 28 - 139 | 4.54 | 3.54 | 20 | |
| 2-Nitrophenol | 5.08 | 0.20 | 5 | 0 | 102 | 40 - 120 | 5.102 | 0.43 | 20 | |
| 3&4-Methylphenol | 4.589 | 0.20 | 5 | 0 | 91.8 | 35 - 120 | 4.605 | 0.352 | 20 | |
| 3,3'-Dichlorobenzidine | 5.711 | 0.20 | 5 | 0 | 114 | 15 - 120 | 5.549 | 2.88 | 20 | |
| 3-Nitroaniline | 3.728 | 0.20 | 5 | 0 | 74.6 | 30 - 120 | 4.379 | 16.1 | 20 | |
| 4,6-Dinitro-2-methylphenol | 4.493 | 0.20 | 5 | 0 | 89.9 | 25 - 121 | 4.283 | 4.79 | 30 | |
| 4-Bromophenyl phenyl ether | 4.926 | 0.20 | 5 | 0 | 98.5 | 45 - 120 | 4.788 | 2.83 | 20 | |
| 4-Chloro-3-methylphenol | 4.697 | 0.20 | 5 | 0 | 93.9 | 47 - 120 | 4.889 | 4 | 20 | |
| 4-Chloroaniline | 4.273 | 0.20 | 5 | 0 | 85.5 | 20 - 120 | 4.601 | 7.38 | 20 | |
| 4-Chlorophenyl phenyl ether | 5.044 | 0.20 | 5 | 0 | 101 | 50 - 120 | 4.94 | 2.08 | 20 | |
| 4-Nitroaniline | 4.573 | 0.20 | 5 | 0 | 91.5 | 30 - 133 | 4.449 | 2.75 | 20 | |
| 4-Nitrophenol | 4.214 | 1.0 | 5 | 0 | 84.3 | 30 - 130 | 4.844 | 13.9 | 20 | |
| Acenaphthene | 4.336 | 0.10 | 5 | 0 | 86.7 | 45 - 120 | 4.383 | 1.08 | 20 | |
| Acenaphthylene | 4.552 | 0.10 | 5 | 0 | 91.0 | 47 - 120 | 4.571 | 0.41 | 20 | |
| Anthracene | 4.897 | 0.10 | 5 | 0 | 97.9 | 45 - 120 | 4.874 | 0.453 | 20 | |
| Benz(a)anthracene | 4.792 | 0.10 | 5 | 0 | 95.8 | 40 - 120 | 4.888 | 1.99 | 20 | |
| Benzidine | 4.135 | 0.20 | 5 | 0 | 82.7 | 10 - 120 | 4.452 | 7.38 | 30 | |
| Benzo(a)pyrene | 5.715 | 0.10 | 5 | 0 | 114 | 45 - 120 | 5.533 | 3.24 | 20 | |
| Benzo(b)fluoranthene | 5.945 | 0.10 | 5 | 0 | 119 | 50 - 120 | 5.996 | 0.859 | 20 | |
| Benzo(g,h,i)perylene | 5.149 | 0.10 | 5 | 0 | 103 | 42 - 127 | 4.992 | 3.1 | 20 | |
| Benzo(k)fluoranthene | 5.221 | 0.10 | 5 | 0 | 104 | 45 - 127 | 5.301 | 1.52 | 20 | |
| Benzyl alcohol | 4.483 | 0.20 | 5 | 0 | 89.7 | 35 - 122 | 4.534 | 1.12 | 20 | |

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works IDWW
WorkOrder: HS19060363

QC BATCH REPORT

| Batch ID: 141877 (0) | | Instrument: SV-7 | | Method: LOW-LEVEL SEMIVOLATILES BY 8270D | | | | | | |
|-----------------------------|--------|------------------------|---------|--|------|----------------------------------|---------------|--------|-----------|------|
| LCSD | | Sample ID: LCSD-141877 | | Units: ug/L | | Analysis Date: 11-Jun-2019 13:28 | | | | |
| Client ID: | | Run ID: SV-7_340239 | | SeqNo: 5116731 | | PrepDate: 11-Jun-2019 | | DF: 1 | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
| Bis(2-chloroethoxy)methane | 4.277 | 0.20 | 5 | 0 | 85.5 | 45 - 120 | 4.397 | 2.77 | 20 | |
| Bis(2-chloroethyl)ether | 4.754 | 0.20 | 5 | 0 | 95.1 | 37 - 121 | 5.238 | 9.68 | 20 | |
| Bis(2-chloroisopropyl)ether | 3.765 | 0.20 | 5 | 0 | 75.3 | 40 - 120 | 4.152 | 9.79 | 20 | |
| Bis(2-ethylhexyl)phthalate | 4.804 | 0.20 | 5 | 0 | 96.1 | 40 - 139 | 5.317 | 10.1 | 20 | |
| Butyl benzyl phthalate | 4.898 | 0.20 | 5 | 0 | 98.0 | 47 - 123 | 5.2 | 5.99 | 20 | |
| Carbazole | 4.109 | 0.20 | 5 | 0 | 82.2 | 42 - 128 | 3.54 | 14.9 | 20 | |
| Chrysene | 4.776 | 0.10 | 5 | 0 | 95.5 | 43 - 120 | 4.957 | 3.7 | 20 | |
| Dibenz(a,h)anthracene | 5.954 | 0.10 | 5 | 0 | 119 | 45 - 125 | 5.67 | 4.89 | 20 | |
| Dibenzofuran | 4.716 | 0.10 | 5 | 0 | 94.3 | 50 - 120 | 4.857 | 2.94 | 20 | |
| Diethyl phthalate | 4.558 | 0.20 | 5 | 0 | 91.2 | 41 - 120 | 4.78 | 4.77 | 20 | |
| Dimethyl phthalate | 4.72 | 0.20 | 5 | 0 | 94.4 | 40 - 122 | 4.767 | 0.999 | 20 | |
| Di-n-butyl phthalate | 4.944 | 0.20 | 5 | 0 | 98.9 | 45 - 123 | 5.08 | 2.71 | 20 | |
| Di-n-octyl phthalate | 5.344 | 0.20 | 5 | 0 | 107 | 45 - 129 | 5.713 | 6.67 | 20 | |
| Fluoranthene | 5.113 | 0.10 | 5 | 0 | 102 | 45 - 125 | 5.1 | 0.248 | 20 | |
| Fluorene | 4.813 | 0.10 | 5 | 0 | 96.3 | 49 - 120 | 4.919 | 2.18 | 20 | |
| Hexachlorobenzene | 4.763 | 0.20 | 5 | 0 | 95.3 | 48 - 120 | 4.477 | 6.19 | 20 | |
| Hexachlorobutadiene | 4.552 | 0.20 | 5 | 0 | 91.0 | 40 - 120 | 4.698 | 3.15 | 20 | |
| Hexachlorocyclopentadiene | 2.983 | 0.20 | 5 | 0 | 59.7 | 34 - 136 | 2.956 | 0.906 | 20 | |
| Hexachloroethane | 4.359 | 0.20 | 5 | 0 | 87.2 | 40 - 120 | 4.522 | 3.68 | 20 | |
| Indeno(1,2,3-cd)pyrene | 5.252 | 0.10 | 5 | 0 | 105 | 41 - 128 | 5.17 | 1.56 | 20 | |
| Isophorone | 4.167 | 0.20 | 5 | 0 | 83.3 | 40 - 121 | 4.218 | 1.22 | 20 | |
| Naphthalene | 4.418 | 0.10 | 5 | 0 | 88.4 | 45 - 120 | 4.552 | 3 | 20 | |
| Nitrobenzene | 4.082 | 0.20 | 5 | 0 | 81.6 | 44 - 120 | 3.994 | 2.18 | 20 | |
| N-Nitrosodimethylamine | 3.515 | 0.20 | 5 | 0 | 70.3 | 30 - 121 | 3.622 | 2.99 | 20 | |
| N-Nitrosodi-n-propylamine | 3.87 | 0.20 | 5 | 0 | 77.4 | 40 - 120 | 4.227 | 8.83 | 20 | |
| N-Nitrosodiphenylamine | 4.606 | 0.20 | 5 | 0 | 92.1 | 40 - 125 | 4.61 | 0.0921 | 20 | |
| Pentachlorophenol | 3.331 | 0.20 | 5 | 0 | 66.6 | 19 - 121 | 3.321 | 0.296 | 20 | |
| Phenanthrene | 4.682 | 0.10 | 5 | 0 | 93.6 | 45 - 121 | 4.646 | 0.781 | 20 | |
| Phenol | 4.523 | 0.20 | 5 | 0 | 90.5 | 20 - 124 | 4.847 | 6.91 | 20 | |
| Pyrene | 4.961 | 0.10 | 5 | 0 | 99.2 | 40 - 130 | 5.066 | 2.09 | 20 | |
| Pyridine | 3.738 | 1.0 | 5 | 0 | 74.8 | 15 - 120 | 3.853 | 3.03 | 20 | |
| Surr: 2,4,6-Tribromophenol | 5.022 | 0.20 | 5 | 0 | 100 | 34 - 129 | 4.778 | 4.98 | 20 | |
| Surr: 2-Fluorobiphenyl | 4.53 | 0.20 | 5 | 0 | 90.6 | 40 - 125 | 4.715 | 4.01 | 20 | |
| Surr: 2-Fluorophenol | 3.909 | 0.20 | 5 | 0 | 78.2 | 20 - 120 | 4.166 | 6.39 | 20 | |

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works IDWW
WorkOrder: HS19060363

QC BATCH REPORT

| Batch ID: 141877 (0) | | Instrument: SV-7 | | Method: LOW-LEVEL SEMIVOLATILES BY 8270D | | | | | | |
|------------------------------|-------------------------------|-----------------------|---------|--|---|---------------|---------------|------|----------------|--|
| LCSD | Sample ID: LCSD-141877 | Units: ug/L | | | Analysis Date: 11-Jun-2019 13:28 | | | | | |
| Client ID: | Run ID: SV-7_340239 | SeqNo: 5116731 | | PrepDate: 11-Jun-2019 | | DF: 1 | | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit Qual | |
| <i>Surr: 4-Terphenyl-d14</i> | 5.133 | 0.20 | 5 | 0 | 103 | 40 - 135 | 4.833 | 6.03 | 20 | |
| <i>Surr: Nitrobenzene-d5</i> | 3.91 | 0.20 | 5 | 0 | 78.2 | 41 - 120 | 3.993 | 2.1 | 20 | |
| <i>Surr: Phenol-d6</i> | 4.175 | 0.20 | 5 | 0 | 83.5 | 20 - 120 | 4.379 | 4.77 | 20 | |

The following samples were analyzed in this batch: HS19060363-01

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works IDWW
WorkOrder: HS19060363

QC BATCH REPORT

| Batch ID: R340491 (0) | | Instrument: VOA9 | | Method: LOW LEVEL VOLATILES BY SW8260C | | | | | | |
|------------------------------------|-----------------------------------|-----------------------|---------|--|---|---------------|----------------|------|----------------|--|
| MBLK | Sample ID: VBLKW-190613 | Units: ug/L | | | Analysis Date: 13-Jun-2019 23:48 | | | | | |
| Client ID: | Run ID: VOA9_340491 | SeqNo: 5122227 | | PrepDate: | | | DF: 1 | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit Qual | |
| Benzene | < 1.0 | 1.0 | | | | | | | | |
| Ethylbenzene | < 1.0 | 1.0 | | | | | | | | |
| Toluene | < 1.0 | 1.0 | | | | | | | | |
| Xylenes, Total | < 1.0 | 1.0 | | | | | | | | |
| <i>Surr: 1,2-Dichloroethane-d4</i> | 48.22 | 1.0 | 50 | 0 | 96.4 | 70 - 123 | | | | |
| <i>Surr: 4-Bromofluorobenzene</i> | 47.32 | 1.0 | 50 | 0 | 94.6 | 82 - 115 | | | | |
| <i>Surr: Dibromofluoromethane</i> | 49.54 | 1.0 | 50 | 0 | 99.1 | 73 - 126 | | | | |
| <i>Surr: Toluene-d8</i> | 50.27 | 1.0 | 50 | 0 | 101 | 81 - 120 | | | | |
| LCS | Sample ID: VLC SW-190613 | Units: ug/L | | | Analysis Date: 13-Jun-2019 22:58 | | | | | |
| Client ID: | Run ID: VOA9_340491 | SeqNo: 5122226 | | PrepDate: | | | DF: 1 | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit Qual | |
| Benzene | 19.34 | 1.0 | 20 | 0 | 96.7 | 74 - 120 | | | | |
| Ethylbenzene | 18.4 | 1.0 | 20 | 0 | 92.0 | 77 - 117 | | | | |
| Toluene | 18.88 | 1.0 | 20 | 0 | 94.4 | 77 - 118 | | | | |
| Xylenes, Total | 58.94 | 1.0 | 60 | 0 | 98.2 | 75 - 122 | | | | |
| <i>Surr: 1,2-Dichloroethane-d4</i> | 46.43 | 1.0 | 50 | 0 | 92.9 | 70 - 130 | | | | |
| <i>Surr: 4-Bromofluorobenzene</i> | 48.58 | 1.0 | 50 | 0 | 97.2 | 82 - 115 | | | | |
| <i>Surr: Dibromofluoromethane</i> | 50.69 | 1.0 | 50 | 0 | 101 | 73 - 126 | | | | |
| <i>Surr: Toluene-d8</i> | 49.2 | 1.0 | 50 | 0 | 98.4 | 81 - 120 | | | | |
| MS | Sample ID: HS19060352-01MS | Units: ug/L | | | Analysis Date: 14-Jun-2019 01:02 | | | | | |
| Client ID: | Run ID: VOA9_340491 | SeqNo: 5122229 | | PrepDate: | | | DF: 500 | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit Qual | |
| Benzene | 47560 | 500 | 10000 | 35900 | 117 | 70 - 127 | | | | |
| Ethylbenzene | 13170 | 500 | 10000 | 1142 | 120 | 70 - 124 | | | | |
| Toluene | 20820 | 500 | 10000 | 9873 | 109 | 70 - 123 | | | | |
| Xylenes, Total | 40820 | 500 | 30000 | 4165 | 122 | 70 - 130 | | | | |
| <i>Surr: 1,2-Dichloroethane-d4</i> | 23820 | 500 | 25000 | 0 | 95.3 | 70 - 126 | | | | |
| <i>Surr: 4-Bromofluorobenzene</i> | 24480 | 500 | 25000 | 0 | 97.9 | 81 - 113 | | | | |
| <i>Surr: Dibromofluoromethane</i> | 25650 | 500 | 25000 | 0 | 103 | 77 - 123 | | | | |
| <i>Surr: Toluene-d8</i> | 25090 | 500 | 25000 | 0 | 100 | 82 - 127 | | | | |

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works IDWW
WorkOrder: HS19060363

QC BATCH REPORT

| | | | | | | | | | |
|--------------------------------|------------------------------------|-------------------------|---------|---|------|----------------|---------------|------|----------------|
| Batch ID: R340491 (0) | | Instrument: VOA9 | | Method: LOW LEVEL VOLATILES BY SW8260C | | | | | |
| MSD | Sample ID: HS19060352-01MSD | Units: ug/L | | Analysis Date: 14-Jun-2019 01:27 | | | | | |
| Client ID: | Run ID: VOA9_340491 | SeqNo: 5122230 | | PrepDate: | | DF: 500 | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit Qual |

| | | | | | | | | | |
|------------------------------------|--------------|------------|--------------|----------|-------------|-----------------|--------------|--------------|-----------|
| Benzene | 43240 | 500 | 10000 | 35900 | 73.4 | 70 - 127 | 47560 | 9.51 | 20 |
| Ethylbenzene | 11640 | 500 | 10000 | 1142 | 105 | 70 - 124 | 13170 | 12.3 | 20 |
| Toluene | 18860 | 500 | 10000 | 9873 | 89.9 | 70 - 123 | 20820 | 9.86 | 20 |
| Xylenes, Total | 36990 | 500 | 30000 | 4165 | 109 | 70 - 130 | 40820 | 9.83 | 20 |
| <i>Surr: 1,2-Dichloroethane-d4</i> | <i>23930</i> | <i>500</i> | <i>25000</i> | <i>0</i> | <i>95.7</i> | <i>70 - 126</i> | <i>23820</i> | <i>0.442</i> | <i>20</i> |
| <i>Surr: 4-Bromofluorobenzene</i> | <i>23720</i> | <i>500</i> | <i>25000</i> | <i>0</i> | <i>94.9</i> | <i>81 - 113</i> | <i>24480</i> | <i>3.16</i> | <i>20</i> |
| <i>Surr: Dibromofluoromethane</i> | <i>25310</i> | <i>500</i> | <i>25000</i> | <i>0</i> | <i>101</i> | <i>77 - 123</i> | <i>25650</i> | <i>1.33</i> | <i>20</i> |
| <i>Surr: Toluene-d8</i> | <i>24390</i> | <i>500</i> | <i>25000</i> | <i>0</i> | <i>97.6</i> | <i>82 - 127</i> | <i>25090</i> | <i>2.85</i> | <i>20</i> |

The following samples were analyzed in this batch: HS19060363-01

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works IDWW
WorkOrder: HS19060363

QC BATCH REPORT

| | | |
|-------------------------------|----------------------------|---------------------------------|
| Batch ID: 141976 (0) | Instrument: UV-2450 | Method: CYANIDE - SW9014 |
|-------------------------------|----------------------------|---------------------------------|

| | | | | | | | | | | |
|-------------|-------------------------------|-----------------------|---|---------------|------|---------------|---------------|----------|-----------|----------|
| MBLK | Sample ID: MBLK-141976 | Units: mg/L | Analysis Date: 13-Jun-2019 09:10 | | | | | | | |
| Client ID: | Run ID: UV-2450_340406 | SeqNo: 5120431 | PrepDate: 12-Jun-2019 DF: 1 | | | | | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD %RPD | RPD Limit | RPD Qual |

Cyanide < 0.00500 0.00500

| | | | | | | | | | | |
|------------|-------------------------------|-----------------------|---|---------------|------|---------------|---------------|----------|-----------|----------|
| LCS | Sample ID: LCS-141976 | Units: mg/L | Analysis Date: 13-Jun-2019 09:10 | | | | | | | |
| Client ID: | Run ID: UV-2450_340406 | SeqNo: 5120430 | PrepDate: 12-Jun-2019 DF: 1 | | | | | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD %RPD | RPD Limit | RPD Qual |

Cyanide 0.18 0.00500 0.2 0 90.0 80 - 120

| | | | | | | | | | | |
|------------|-----------------------------------|-----------------------|---|---------------|------|---------------|---------------|----------|-----------|----------|
| MS | Sample ID: HS19060177-01MS | Units: mg/L | Analysis Date: 13-Jun-2019 09:10 | | | | | | | |
| Client ID: | Run ID: UV-2450_340406 | SeqNo: 5120428 | PrepDate: 12-Jun-2019 DF: 1 | | | | | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD %RPD | RPD Limit | RPD Qual |

Cyanide 0.191 0.00500 0.2 0.003 94.0 80 - 120

| | | | | | | | | | | |
|------------|------------------------------------|-----------------------|---|---------------|------|---------------|---------------|----------|-----------|----------|
| MSD | Sample ID: HS19060177-01MSD | Units: mg/L | Analysis Date: 13-Jun-2019 09:10 | | | | | | | |
| Client ID: | Run ID: UV-2450_340406 | SeqNo: 5120429 | PrepDate: 12-Jun-2019 DF: 1 | | | | | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD %RPD | RPD Limit | RPD Qual |

Cyanide 0.191 0.00500 0.2 0.003 94.0 80 - 120 0.191 0 20

The following samples were analyzed in this batch: HS19060363-01

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works IDWW
WorkOrder: HS19060363

QC BATCH REPORT

| Batch ID: R340220 (0) | | Instrument: WetChem_HS | | Method: SULFIDE BY SM4500 S2-F | | | | | | |
|-------------------------|-----------------------------------|------------------------|---------|--------------------------------|---|---------------|---------------|-------|----------------|--|
| MBLK | Sample ID: MBLK-R340220 | Units: mg/L | | | Analysis Date: 10-Jun-2019 11:45 | | | | | |
| Client ID: | Run ID: WetChem_HS_340220 | SeqNo: 5115915 | | PrepDate: | | | DF: 1 | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit Qual | |
| Sulfide | < 1.00 | 1.00 | | | | | | | | |
| LCS | Sample ID: LCS-340220 | Units: mg/L | | | Analysis Date: 10-Jun-2019 11:45 | | | | | |
| Client ID: | Run ID: WetChem_HS_340220 | SeqNo: 5115938 | | PrepDate: | | | DF: 1 | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit Qual | |
| Sulfide | 21.52 | 1.00 | 25 | 0 | 86.1 | 85 - 115 | | | | |
| LCSD | Sample ID: LCSD-340220 | Units: mg/L | | | Analysis Date: 10-Jun-2019 11:45 | | | | | |
| Client ID: | Run ID: WetChem_HS_340220 | SeqNo: 5115939 | | PrepDate: | | | DF: 1 | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit Qual | |
| Sulfide | 21.72 | 1.00 | 25 | 0 | 86.9 | 85 - 115 | 21.52 | 0.925 | 20 | |
| MS | Sample ID: HS19060333-02MS | Units: mg/L | | | Analysis Date: 10-Jun-2019 11:45 | | | | | |
| Client ID: | Run ID: WetChem_HS_340220 | SeqNo: 5115940 | | PrepDate: | | | DF: 1 | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit Qual | |
| Sulfide | 21.88 | 1.00 | 25 | 2.88 | 76.0 | 80 - 120 | | | S | |

The following samples were analyzed in this batch: HS19060363-01

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works IDWW
WorkOrder: HS19060363

QC BATCH REPORT

| | | | | | | | | | | |
|--------------------------------|------------------------------------|-------------------------------|---------|---|------|---------------|---------------|------|-----------|------|
| Batch ID: R340325 (0) | | Instrument: WetChem_HS | | Method: PH BY SW9040C | | | | | | |
| DUP | Sample ID: HS19060370-01DUP | Units: pH Units | | Analysis Date: 12-Jun-2019 12:00 | | | | | | |
| Client ID: | Run ID: WetChem_HS_340325 | SeqNo: 5118263 | | PrepDate: | | DF: 1 | | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |

| | | | | | | | | | | |
|----------------|------|-------|--|--|--|--|------|-------|----|--|
| pH | 6.78 | 0.100 | | | | | 6.77 | 0.148 | 10 | |
| Temp Deg C @pH | 21.3 | 0 | | | | | 21.2 | 0.471 | 10 | |

The following samples were analyzed in this batch:

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works IDWW
WorkOrder: HS19060363

QC BATCH REPORT

Batch ID: R340447 (0) Instrument: WetChem_HS Method: FLASH POINT BY PENSKY-MARTENS SW1010A

| | | | | | | | | | |
|------------|----------------------------------|-----------------------|-----------|---------------|---|---------------|---------------|----------|----------------|
| LCS | Sample ID: LCS-R340447 | Units: °F | | | Analysis Date: 13-Jun-2019 14:00 | | | | |
| Client ID: | Run ID: WetChem_HS_340447 | SeqNo: 5120974 | PrepDate: | DF: 1 | | | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD %RPD | RPD Limit Qual |

Ignitability 83.7 70.0 81 0 103 95 - 105

| | | | | | | | | | |
|------------|------------------------------------|-----------------------|-----------|---------------|---|---------------|---------------|----------|----------------|
| DUP | Sample ID: HS19060303-01DUP | Units: °F | | | Analysis Date: 13-Jun-2019 14:00 | | | | |
| Client ID: | Run ID: WetChem_HS_340447 | SeqNo: 5120975 | PrepDate: | DF: 1 | | | | | |
| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | RPD %RPD | RPD Limit Qual |

Ignitability 117.7 70.0 119.7 1.68 20

The following samples were analyzed in this batch:

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works IDWW
WorkOrder: HS19060363

**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 Quantitation Limit |
| SD | Serial Dilution |
| SDL | Sample Detection Limit |
| TRRP | Texas Risk Reduction Program |

| Unit Reported | Description |
|----------------------|----------------------|
| mg/L | Milligrams per Liter |

CERTIFICATIONS,ACCREDITATIONS & LICENSES

| Agency | Number | Expire Date |
|-----------------|-------------------|--------------------|
| 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 |



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Holland, MI
+1 616 399 6070

Chain of Custody Form

Page 1 of 1

COC ID: 205126

HS19060363

WV

Golder Associates Inc.

Houston TX-Wood Preserving Works IDWW

ALS Project Manager:



| Customer Information | | Project Information | | ALS Project Manager: | |
|----------------------|---------------------------------------|---------------------|----------------------------------|----------------------|---|
| Purchase Order | UPRR/Kevin Peterburs | Project Name | Houston TX-Wood Preserving Works | A | 8260_LL_W (5635947 BTEX (IDWW)) |
| Work Order | | Project Number | 1620-08-Rev0 (IDWW) | B | TX1005_W_Low (5643233 TPH TX1005) |
| Company Name | Golder Associates Inc. | Bill To Company | Union Pacific Railroad- A/P | C | 8270_LOW_W (5632532 SemiVolatiles (w/pyridine)) |
| Send Report To | Eric Matzner | Invoice Attn | Accounts Payable | D | ICP_TW (5652643 RCRA 8 Metals) |
| Address | 2201 Double Creek Drive Suite 4004 | Address | 1400 Douglas Street Stop 0750 | E | CN_TW_9014 (5652638 Cyanide - RCI) |
| | | | | F | SULFD_4500S F (5652638 Sulfide - RCI) |
| City/State/Zip | Round Rock, TX 78664 | City/State/Zip | Omaha NE 681790750 | G | pH_W_9040C (5632436 pH - RCI) |
| Phone | (512) 671-3434 | Phone | | H | IGN_W (5652637 Ignitability - RCI) |
| Fax | (512) 671-3446 | Fax | | I | |
| e-Mail Address | Eric_Matzner@golder.com | e-Mail Address | | J | |

| No. | Sample Description | Date | Time | Matrix | Pres. | # Bottles | A | B | C | D | E | F | G | H | I | J | Hold |
|-----|-------------------------------|----------|------|------------------|--------------------|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|------|
| 1 | WG 1620 IDW W-2019 | | | Water | 1,2,4,8 | 12 | X | X | X | X | X | X | X | X | X | X | |
| 2 | WW-1620-TotWater-20190606 | 06/06/19 | 1100 | Water | 1,2,4,8 | 12 | X | X | X | X | X | X | X | X | | | |
| 3 | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | |

Sampler(s) Please Print & Sign
 Jacqueline Engel

Shipment Method: _____ Required Turnaround Time: (Check Box) STD 10 Wk Days 5 Wk Days 2 Wk Days 24 Hour Results Due Date: _____

Relinquished by: Date: 06/06/19 Time: 1245 Received by: _____

Relinquished by: Date: _____ Time: _____ Received by (Laboratory): R Cigs 6/6/19 13:40

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

Notes: UPRR Houston HWPW 1620

Cooler ID: 24587 Cooler Temp.: 5.9C

QC Package: (Check One Box Below) Level II Std QC RRP Checklist Level III Std QC/Row Date RRP Level IV Level IV SW846/CLP Other

Preservative Key: 1-HCl 2-HNO₃ 3-H₂SO₄ 4-NaOH 5-Na₂S₂O₃ 6-NaHSO₄ 7-Other 8-4°C 9-5035

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

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| CUSTODY SEAL | | Seal Broken By: |
|------------------|-------------|-----------------|
| Date: 6/6/19 | Time: 12:50 | NA |
| Name: J. Lopez | | Date: |
| Company: Solides | | 6.6.19 |



ALS
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June 28, 2019

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

Work Order: **HS19061365**

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

Dear Eric,

ALS Environmental received 1 sample(s) on Jun 26, 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.
Project: Houston TX-Wood Preserving Works
Work Order: HS19061365

SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---------------|-----------------------------|--------|-------|-------------------|-------------------|--------------------------|
| HS19061365-01 | WSW-1620-NCS_Water-20190626 | Water | | 26-Jun-2019 11:20 | 26-Jun-2019 12:10 | <input type="checkbox"/> |

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Work Order: HS19061365

CASE NARRATIVE

Work Order Comments

- The analysis for VOCs was subcontracted to Pace Analytical in Mount Juliet, TN. Final report attached.
-

WetChemistry by Method SW1010

Batch ID: R341420

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
-

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works
 Sample ID: WSW-1620-NCS_Water-20190626
 Collection Date: 26-Jun-2019 11:20

ANALYTICAL REPORT

WorkOrder:HS19061365
 Lab ID:HS19061365-01
 Matrix:Water

| ANALYSES | RESULT | QUAL | REPORT LIMIT | UNITS | DILUTION FACTOR | DATE ANALYZED |
|--|--------------|---------------------------|--------------|-------|-----------------|-------------------|
| FLASH POINT BY PENSKY-MARTENS SW1010A | | Method:SW1010 | | | | Analyst: KAH |
| Ignitability | > 212 | | 70.0 | °F | 1 | 27-Jun-2019 15:00 |
| SUBCONTRACT ANALYSIS -VOC ANALYSIS | | Method:SUBCONTRACT | | | | Analyst: SUB |
| Subcontracted Analyses | See Attached | | | NA | 1 | 28-Jun-2019 14:45 |

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

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19061365

DATES REPORT

| Sample ID | Client Samp ID | Collection Date | TCLP Date | Prep Date | Analysis Date | DF |
|-------------------------|-----------------------------|---|-----------|-----------|----------------------|----|
| Batch ID R341420 | | Test Name : FLASH POINT BY PENSKEY-MARTENS SW1010A | | | Matrix: Water | |
| HS19061365-01 | WSW-1620-NCS_Water-20190626 | 26 Jun 2019 11:20 | | | 27 Jun 2019 15:00 | 1 |
| Batch ID R341501 | | Test Name : SUBCONTRACT ANALYSIS -VOC ANALYSIS | | | Matrix: Water | |
| HS19061365-01 | WSW-1620-NCS_Water-20190626 | 26 Jun 2019 11:20 | | | 28 Jun 2019 14:45 | 1 |

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19061365

QC BATCH REPORT

Batch ID: R341420 (0) **Instrument:** WetChem_HS **Method:** FLASH POINT BY PENSKY-MARTENS SW1010A

LCS Sample ID: **LCS-R341420** Units: °F Analysis Date: **27-Jun-2019 15:00**
 Client ID: Run ID: **WetChem_HS_341420** SeqNo: **5143447** PrepDate: DF: **1**
 Analyte Result PQL SPK Val SPK Ref Value %REC Control Limit RPD Ref Value %RPD RPD Limit Qual

Ignitability 83.62 70.0 81 0 103 95 - 105

DUP Sample ID: **HS19061365-01DUP** Units: °F Analysis Date: **27-Jun-2019 15:00**
 Client ID: **WSW-1620-NCS_Water-20190626** Run ID: **WetChem_HS_341420** SeqNo: **5143448** PrepDate: DF: **1**
 Analyte Result PQL SPK Val SPK Ref Value %REC Control Limit RPD Ref Value %RPD RPD Limit Qual

Ignitability > 212 70.0 0 0 20

The following samples were analyzed in this batch:

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS19061365

**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 Quantitation Limit |
| SD | Serial Dilution |
| SDL | Sample Detection Limit |
| TRRP | Texas Risk Reduction Program |

CERTIFICATIONS,ACCREDITATIONS & LICENSES

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

Sample Receipt Checklist

Client Name: PBW
Work Order: HS19061365

Date/Time Received: 26-Jun-2019 12:10
Received by: AC

Checklist completed by: Asad Chaudhry
eSignature
Date: 26-Jun-2019

Reviewed by: Dane J. Wacasey
eSignature
Date: 26-Jun-2019

Matrices: Water

Carrier name: Client

- Shipping container/cooler in good condition? Yes [checked] No [] Not Present []
Custody seals intact on shipping container/cooler? Yes [] No [] Not Present [checked]
Custody seals intact on sample bottles? Yes [] No [] Not Present [checked]
VOA/TX1005/TX1006 Solids in hermetically sealed vials? Yes [] No [] Not Present [checked]
Chain of custody present? Yes [checked] No []
Chain of custody signed when relinquished and received? Yes [checked] No []
Samplers name present on COC? Yes [checked] No []
Chain of custody agrees with sample labels? Yes [checked] No []
Samples in proper container/bottle? Yes [checked] No []
Sample containers intact? Yes [checked] No []
Sufficient sample volume for indicated test? Yes [checked] No []
All samples received within holding time? Yes [checked] No []
Container/Temp Blank temperature in compliance? Yes [] No [checked]

1 Page(s)
COC IDs:203864

Temperature(s)/Thermometer(s): 7.6c C/UC IR 11
Cooler(s)/Kit(s): 45181
Date/Time sample(s) sent to storage: 06/26/2019 12:45
Water - VOA vials have zero headspace? Yes [checked] No [] No VOA vials submitted []
Water - pH acceptable upon receipt? Yes [] No [] N/A [checked]
pH adjusted? Yes [] No [] N/A [checked]
pH adjusted by:

Login Notes: Sx received on Ice. Cooling in process.

Client Contacted: Date Contacted: Person Contacted:
Contacted By: Regarding:
Comments:
Corrective Action:



Cincinnati, OH
+1 513 733 5336

Everett, WA
+1 425 356 2600

Fort Collins, CO
+1 970 490 1511

Holland, MI
+1 616 399 6070

Chain of Custody Form

Page 1 of 1

COC ID: 203864

Houston, TX
+1 281 530 5656

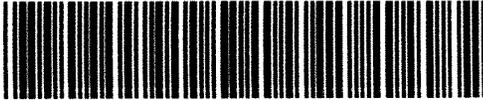
Middletown, PA
+1 717 944 5541

Spring City, PA
+1 610 948 4903

Salt Lake City, UT
+1 801 266 7700

South Charleston, WV
+1 304 356 3168

York, PA
+1 717 505 5280

| Customer Information | | Project Information | | ALS Project Manager: | | ALS Work Order #: | |
|----------------------|---------------------------------------|---------------------|----------------------------------|---------------------------------------|---|-------------------|--|
| Purchase Order | | Project Name | | Parameter/Method Request for Analysis | | | |
| Purchase Order | UPRR/Kevin Peterburs | Project Name | Houston TX-Wood Preserving Works | A | SUB_VOC (5632528 Volatile Organics (Pace Mt Juliet, TN)) | | |
| Work Order | | Project Number | 1620-08-Rev1 SR 92688 IDWW | B | IGN_W (5652637 Ignitability - RCI) | | |
| Company Name | Golder Associates Inc. | Bill To Company | Union Pacific Railroad- A/P | C | | | |
| Send Report To | Eric Matzner | Invoice Attn | Accounts Payable | D | | | |
| Address | 2201 Double Creek Drive Suite 4004 | Address | 1400 Douglas Street Stop 0750 | E | <p style="text-align: center;">HS19061365</p> <p style="text-align: center;">Golder Associates Inc. Houston TX-Wood Preserving Works</p>  | | |
| | | | | F | | | |
| City/State/Zip | Round Rock, TX 78664 | City/State/Zip | Omaha NE 681790750 | G | | | |
| Phone | (512) 671-3434 | Phone | | H | | | |
| Fax | (512) 671-3446 | Fax | | I | | | |
| e-Mail Address | Eric_Matzner@golder.com | e-Mail Address | | J | | | |

| No. | Sample Description | Date | Time | Matrix | Pres. | # Bottles | A | B | C | D | E | F | G | H | I | J | Hold |
|-----|---------------------------------|---------|-------|--------|-------|-----------|---|---|---|---|---|---|---|---|---|---|------|
| 1 | WSW-1620-NV5 Water- 25190626 | 6-26-19 | 11:20 | Water | 1,7 | 4 | X | X | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | |

| | | | | | | | | |
|---|--|--|--|---|--|---|--------------------------|--|
| Sampler(s) Please Print & Sign Sarah Balke <i>Sarah Balke</i> | | Shipment Method Delivery | | Required Turnaround Time: (Check Box) <input type="checkbox"/> STD 10 Wk Days <input type="checkbox"/> 5 Wk Days <input type="checkbox"/> 2 Wk Days <input checked="" type="checkbox"/> 24 Hour | | | Results Due Date: | |
| Relinquished by: <i>Sarah Balke</i> | | Date: 12:10 Time: 6-26-19 | | Received by: AC | | Notes: UPRR Houston HWPW 1620 | | |
| Relinquished by: | | Date: 12:10 Time: 6-26-19 | | Received by (Laboratory): | | QC Package: (Check One Box Below) <input checked="" type="checkbox"/> Level II Std QC <input type="checkbox"/> TRRP Checklist <input type="checkbox"/> Level III Std QC/Raw Data <input type="checkbox"/> TRRP Level IV <input type="checkbox"/> Level IV SW846/CLP <input type="checkbox"/> Other | | |
| Logged by (Laboratory): | | Date: Time: | | Checked by (Laboratory): | | Cooler ID: 45181 Cooler Temp: 7.6 CFID: CFO10 | | |

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental. *COOLER RECEIVED ON ICE.*
 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. *COOLING IN PROCESS*
 3. The Chain of Custody is a legal document. All information must be completed accurately.

Copyright 2011 by ALS Environmental.

June 28, 2019

1 Cp

2 Tc

3 Ss

4 Cn

5 Tr

6 Sr

7 Qc

8 Gl

9 Al

10 Sc

ALS Environmental - Houston, TX

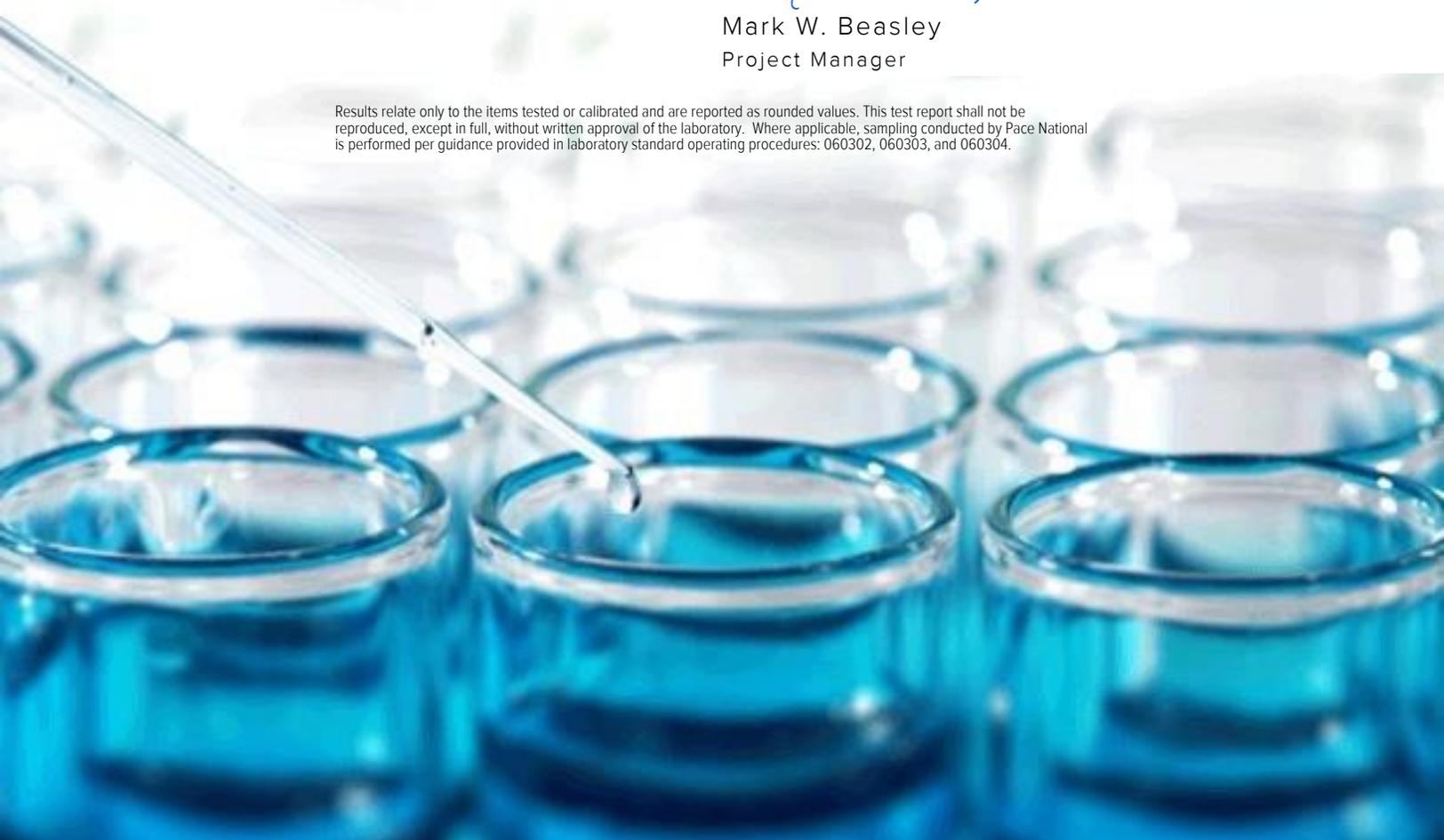
Sample Delivery Group: L1113340
Samples Received: 06/27/2019
Project Number: HS19061365-01
Description:

Report To: Dane Wacasey
10450 Stancliff Rd.
Suite 210
Houston, TX 77099

Entire Report Reviewed By:

Mark W. Beasley
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.





| | | |
|--|-----------|------------------------|
| Cp: Cover Page | 1 | ¹Cp |
| Tc: Table of Contents | 2 | ²Tc |
| Ss: Sample Summary | 3 | ³Ss |
| Cn: Case Narrative | 4 | ⁴Cn |
| Tr: TRRP Summary | 5 | ⁵Tr |
| TRRP form R | 6 | ⁶Sr |
| TRRP form S | 7 | ⁷Qc |
| TRRP Exception Reports | 8 | ⁸Gl |
| Sr: Sample Results | 9 | ⁹Al |
| WSW-1620-NCS_WATER-20190626 L1113340-01 | 9 | ¹⁰Sc |
| Qc: Quality Control Summary | 10 | |
| Volatile Organic Compounds (GC/MS) by Method 8260B | 10 | |
| Gl: Glossary of Terms | 13 | |
| Al: Accreditations & Locations | 14 | |
| Sc: Sample Chain of Custody | 15 | |



WSW-1620-NCS_WATER-20190626 L1113340-01 GW

Collected by: _____ Collected date/time: 06/26/19 11:20 Received date/time: 06/27/19 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst | Location |
|--|-----------|----------|-----------------------|--------------------|---------|----------------|
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG1303140 | 5 | 06/28/19 03:19 | 06/28/19 03:19 | BMB | Mt. Juliet, TN |

- ¹Cp
- ²Tc
- ³Ss
- ⁴Cn
- ⁵Tr
- ⁶Sr
- ⁷Qc
- ⁸Gl
- ⁹Al
- ¹⁰Sc



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Mark W. Beasley
Project Manager

- ¹ Cp
- ² Tc
- ³ Ss
- ⁴ Cn
- ⁵ Tr
- ⁶ Sr
- ⁷ Qc
- ⁸ Gl
- ⁹ Al
- ¹⁰ Sc



This data package consists of this signature page, the laboratory review checklist, and the following reportable data as applicable:

- 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.

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

Mark W. Beasley
Project Manager

Laboratory Review Checklist: Reportable Data



| Laboratory Name: Pace Analytical National | | LRC Date: 06/28/2019 14:42 | | | | | |
|---|----------------|--|-----|----|-----------------|-----------------|------------------|
| Project Name: | | Laboratory Job Number: L1113340-01 | | | | | |
| Reviewer Name: Mark W. Beasley | | Prep Batch Number(s): WG1303140 | | | | | |
| # ¹ | A ² | Description | Yes | No | NA ³ | NR ⁴ | ER# ⁵ |
| R1 | OI | Chain-of-custody (C-O-C) | | | | | |
| | | Did samples meet the laboratory's standard conditions of sample acceptability upon receipt? | X | | | | |
| | | Were all departures from standard conditions described in an exception report? | | | X | | |
| R2 | OI | Sample and quality control (QC) identification | | | | | |
| | | Are all field sample ID numbers cross-referenced to the laboratory ID numbers? | X | | | | |
| | | Are all laboratory ID numbers cross-referenced to the corresponding QC data? | X | | | | |
| R3 | OI | Test reports | | | | | |
| | | Were all samples prepared and analyzed within holding times? | X | | | | |
| | | Other than those results < MQL, were all other raw values bracketed by calibration standards? | X | | | | |
| | | Were calculations checked by a peer or supervisor? | X | | | | |
| | | Were all analyte identifications checked by a peer or supervisor? | X | | | | |
| | | Were sample detection limits reported for all analytes not detected? | X | | | | |
| | | Were all results for soil and sediment samples reported on a dry weight basis? | X | | | | |
| | | Were % moisture (or solids) reported for all soil and sediment samples? | | | X | | |
| | | Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035? | | | X | | |
| | | If required for the project, are TICs reported? | | | X | | |
| R4 | O | Surrogate recovery data | | | | | |
| | | Were surrogates added prior to extraction? | X | | | | |
| | | Were surrogate percent recoveries in all samples within the laboratory QC limits? | X | | | | |
| R5 | OI | Test reports/summary forms for blank samples | | | | | |
| | | Were appropriate type(s) of blanks analyzed? | X | | | | |
| | | Were blanks analyzed at the appropriate frequency? | X | | | | |
| | | Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures? | X | | | | |
| | | Were blank concentrations < MQL? | X | | | | |
| R6 | OI | Laboratory control samples (LCS): | | | | | |
| | | Were all COCs included in the LCS? | X | | | | |
| | | Was each LCS taken through the entire analytical procedure, including prep and cleanup steps? | X | | | | |
| | | Were LCSs analyzed at the required frequency? | X | | | | |
| | | Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits? | X | | | | |
| | | Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs? | X | | | | |
| | | Was the LCSD RPD within QC limits? | | X | | | 1 |
| R7 | OI | Matrix spike (MS) and matrix spike duplicate (MSD) data | | | | | |
| | | Were the project/method specified analytes included in the MS and MSD? | | | X | | |
| | | Were MS/MSD analyzed at the appropriate frequency? | | | X | | |
| | | Were MS (and MSD, if applicable) %Rs within the laboratory QC limits? | | | X | | |
| | | Were MS/MSD RPDs within laboratory QC limits? | | | X | | |
| R8 | OI | Analytical duplicate data | | | | | |
| | | Were appropriate analytical duplicates analyzed for each matrix? | | | X | | |
| | | Were analytical duplicates analyzed at the appropriate frequency? | | | X | | |
| | | Were RPDs or relative standard deviations within the laboratory QC limits? | | | X | | |
| R9 | OI | Method quantitation limits (MQLs): | | | | | |
| | | Are the MQLs for each method analyte included in the laboratory data package? | X | | | | |
| | | Do the MQLs correspond to the concentration of the lowest non-zero calibration standard? | X | | | | |
| | | Are unadjusted MQLs and DCSs included in the laboratory data package? | X | | | | |
| R10 | OI | Other problems/anomalies | | | | | |
| | | Are all known problems/anomalies/special conditions noted in this LRC and ER? | X | | | | |
| | | Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results? | X | | | | |
| | | Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package? | X | | | | |

1. 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.

2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);

3. NA = Not applicable;

4. NR = Not reviewed;

5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).



| Laboratory Name: Pace Analytical National | | LRC Date: 06/28/2019 14:42 | | | | | |
|--|----------------|--|-----|----|-----------------|-----------------|------------------|
| Project Name: | | Laboratory Job Number: L1113340-01 | | | | | |
| Reviewer Name: Mark W. Beasley | | Prep Batch Number(s): WG1303140 | | | | | |
| # 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 5.5.10) | | | | | |
| | | Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst? | X | | | | |
| | | Were data associated with manual integrations flagged on the raw data? | X | | | | |
| S6 | O | Dual column confirmation | | | | | |
| | | Did dual column confirmation results meet the method-required QC? | | | X | | |
| S7 | O | Tentatively identified compounds (TICs) | | | | | |
| | | If TICs were requested, were the mass spectra and TIC data subject to appropriate checks? | | | X | | |
| S8 | I | Interference Check Sample (ICS) results | | | | | |
| | | Were percent recoveries within method QC limits? | | | X | | |
| S9 | I | Serial dilutions, post digestion spikes, and method of standard additions | | | | | |
| | | Were percent differences, recoveries, and the linearity within the QC limits specified in the method? | | | X | | |
| S10 | OI | Method detection limit (MDL) studies | | | | | |
| | | Was a MDL study performed for each reported analyte? | X | | | | |
| | | Is the MDL either adjusted or supported by the analysis of DCSs? | X | | | | |
| S11 | OI | Proficiency test reports | | | | | |
| | | Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies? | X | | | | |
| S12 | OI | Standards documentation | | | | | |
| | | Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources? | X | | | | |
| S13 | OI | Compound/analyte identification procedures | | | | | |
| | | Are the procedures for compound/analyte identification documented? | X | | | | |
| S14 | OI | Demonstration of analyst competency (DOC) | | | | | |
| | | Was DOC conducted consistent with NELAC Chapter 5? | X | | | | |
| | | Is documentation of the analyst's competency up-to-date and on file? | X | | | | |
| S15 | OI | Verification/validation documentation for methods (NELAC Chapter 5) | | | | | |
| | | Are all the methods used to generate the data documented, verified, and validated, where applicable? | X | | | | |
| S16 | OI | Laboratory standard operating procedures (SOPs) | | | | | |
| | | Are laboratory SOPs current and on file for each method performed | X | | | | |
| <p>1. 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.</p> <p>2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);</p> <p>3. NA = Not applicable;</p> <p>4. NR = Not reviewed;</p> <p>5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).</p> | | | | | | | |



| Laboratory Name: Pace Analytical National | | LRC Date: 06/28/2019 14:42 | |
|--|---|------------------------------------|--|
| Project Name: | | Laboratory Job Number: L1113340-01 | |
| Reviewer Name: Mark W. Beasley | | Prep Batch Number(s): WG1303140 | |
| ER # ¹ | Description | | |
| 1 | 8260B WG1303140 Bromomethane: Relative Percent Difference is outside of established control limits. | | |
| <p>1. 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.</p> <p>2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);</p> <p>3. NA = Not applicable;</p> <p>4. NR = Not reviewed;</p> <p>5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).</p> | | | |



Collected date/time: 06/26/19 11:20

L1113340

Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result | Qualifier | SDL | Unadj. MQL | MQL | Dilution | Analysis | Batch |
|-----------------------------|---------|-----------|----------|------------|----------|----------|------------------|-----------|
| | mg/l | | mg/l | mg/l | mg/l | | date / time | |
| Acetone | 0.298 | | 0.0500 | 0.0500 | 0.250 | 5 | 06/28/2019 03:19 | WG1303140 |
| Benzene | U | | 0.00166 | 0.00100 | 0.00500 | 5 | 06/28/2019 03:19 | WG1303140 |
| Bromodichloromethane | U | | 0.00190 | 0.00100 | 0.00500 | 5 | 06/28/2019 03:19 | WG1303140 |
| Bromoform | U | | 0.00234 | 0.00100 | 0.00500 | 5 | 06/28/2019 03:19 | WG1303140 |
| Bromomethane | U | J3 | 0.00433 | 0.00500 | 0.0250 | 5 | 06/28/2019 03:19 | WG1303140 |
| Carbon disulfide | 0.00431 | J | 0.00138 | 0.00100 | 0.00500 | 5 | 06/28/2019 03:19 | WG1303140 |
| Carbon tetrachloride | U | | 0.00190 | 0.00100 | 0.00500 | 5 | 06/28/2019 03:19 | WG1303140 |
| Chlorobenzene | U | | 0.00174 | 0.00100 | 0.00500 | 5 | 06/28/2019 03:19 | WG1303140 |
| Bromochloromethane | U | | 0.00260 | 0.00500 | 0.0250 | 5 | 06/28/2019 03:19 | WG1303140 |
| Chlorodibromomethane | U | | 0.00164 | 0.00100 | 0.00500 | 5 | 06/28/2019 03:19 | WG1303140 |
| Chloroethane | U | | 0.00226 | 0.00500 | 0.0250 | 5 | 06/28/2019 03:19 | WG1303140 |
| Chloroform | U | | 0.00162 | 0.00500 | 0.0250 | 5 | 06/28/2019 03:19 | WG1303140 |
| Chloromethane | U | | 0.00138 | 0.00250 | 0.0125 | 5 | 06/28/2019 03:19 | WG1303140 |
| 1,1-Dichloroethane | U | | 0.00130 | 0.00100 | 0.00500 | 5 | 06/28/2019 03:19 | WG1303140 |
| 1,2-Dichloroethane | U | | 0.00180 | 0.00100 | 0.00500 | 5 | 06/28/2019 03:19 | WG1303140 |
| 1,1-Dichloroethene | U | | 0.00199 | 0.00100 | 0.00500 | 5 | 06/28/2019 03:19 | WG1303140 |
| cis-1,2-Dichloroethene | U | | 0.00130 | 0.00100 | 0.00500 | 5 | 06/28/2019 03:19 | WG1303140 |
| trans-1,2-Dichloroethene | U | | 0.00198 | 0.00100 | 0.00500 | 5 | 06/28/2019 03:19 | WG1303140 |
| 1,2-Dichloropropane | U | | 0.00153 | 0.00100 | 0.00500 | 5 | 06/28/2019 03:19 | WG1303140 |
| cis-1,3-Dichloropropene | U | | 0.00209 | 0.00100 | 0.00500 | 5 | 06/28/2019 03:19 | WG1303140 |
| trans-1,3-Dichloropropene | U | | 0.00210 | 0.00100 | 0.00500 | 5 | 06/28/2019 03:19 | WG1303140 |
| Ethylbenzene | 0.00715 | | 0.00192 | 0.00100 | 0.00500 | 5 | 06/28/2019 03:19 | WG1303140 |
| 2-Hexanone | U | | 0.0191 | 0.0100 | 0.0500 | 5 | 06/28/2019 03:19 | WG1303140 |
| 2-Butanone (MEK) | 0.0595 | | 0.0196 | 0.0100 | 0.0500 | 5 | 06/28/2019 03:19 | WG1303140 |
| Methylene Chloride | U | | 0.00500 | 0.00500 | 0.0250 | 5 | 06/28/2019 03:19 | WG1303140 |
| 4-Methyl-2-pentanone (MIBK) | 0.0113 | J | 0.0107 | 0.0100 | 0.0500 | 5 | 06/28/2019 03:19 | WG1303140 |
| Styrene | U | | 0.00154 | 0.00100 | 0.00500 | 5 | 06/28/2019 03:19 | WG1303140 |
| 1,1,2,2-Tetrachloroethane | U | | 0.000650 | 0.00100 | 0.00500 | 5 | 06/28/2019 03:19 | WG1303140 |
| Tetrachloroethene | U | | 0.00186 | 0.00100 | 0.00500 | 5 | 06/28/2019 03:19 | WG1303140 |
| Toluene | 0.0194 | | 0.00206 | 0.00100 | 0.00500 | 5 | 06/28/2019 03:19 | WG1303140 |
| 1,1,1-Trichloroethane | U | | 0.00160 | 0.00100 | 0.00500 | 5 | 06/28/2019 03:19 | WG1303140 |
| 1,1,2-Trichloroethane | U | | 0.00192 | 0.00100 | 0.00500 | 5 | 06/28/2019 03:19 | WG1303140 |
| Trichloroethene | U | | 0.00199 | 0.00100 | 0.00500 | 5 | 06/28/2019 03:19 | WG1303140 |
| Vinyl acetate | U | | 0.00815 | 0.0100 | 0.0500 | 5 | 06/28/2019 03:19 | WG1303140 |
| Vinyl chloride | U | | 0.00130 | 0.00100 | 0.00500 | 5 | 06/28/2019 03:19 | WG1303140 |
| o-Xylene | 0.0457 | | 0.00170 | 0.00100 | 0.00500 | 5 | 06/28/2019 03:19 | WG1303140 |
| m&p-Xylene | 0.0754 | | 0.00360 | 0.00200 | 0.0100 | 5 | 06/28/2019 03:19 | WG1303140 |
| Xylenes, Total | 0.121 | | 0.00530 | 0.00300 | 0.0150 | 5 | 06/28/2019 03:19 | WG1303140 |
| (S) Toluene-d8 | 102 | | | | 80.0-120 | | 06/28/2019 03:19 | WG1303140 |
| (S) 4-Bromofluorobenzene | 101 | | | | 77.0-126 | | 06/28/2019 03:19 | WG1303140 |
| (S) 1,2-Dichloroethane-d4 | 97.9 | | | | 70.0-130 | | 06/28/2019 03:19 | WG1303140 |

1
Cp

2
Tc

3
Ss

4
Cn

5
Tr

6
Sr

7
Qc

8
Gl

9
Al

10
Sc



Method Blank (MB)

(MB) R3425591-3 06/27/19 21:49

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|-----------------------------|-------------------|--------------|----------------|----------------|
| Acetone | U | | 0.0100 | 0.0500 |
| Benzene | U | | 0.000331 | 0.00100 |
| Bromodichloromethane | U | | 0.000380 | 0.00100 |
| Bromochloromethane | U | | 0.000520 | 0.00500 |
| Bromoform | U | | 0.000469 | 0.00100 |
| Bromomethane | U | | 0.000866 | 0.00500 |
| Carbon disulfide | U | | 0.000275 | 0.00100 |
| Carbon tetrachloride | U | | 0.000379 | 0.00100 |
| Chlorobenzene | U | | 0.000348 | 0.00100 |
| Chlorodibromomethane | U | | 0.000327 | 0.00100 |
| Chloroethane | U | | 0.000453 | 0.00500 |
| Chloroform | U | | 0.000324 | 0.00500 |
| Chloromethane | U | | 0.000276 | 0.00250 |
| 1,1-Dichloroethane | U | | 0.000259 | 0.00100 |
| 1,2-Dichloroethane | U | | 0.000361 | 0.00100 |
| 1,1-Dichloroethene | U | | 0.000398 | 0.00100 |
| cis-1,2-Dichloroethene | U | | 0.000260 | 0.00100 |
| trans-1,2-Dichloroethene | U | | 0.000396 | 0.00100 |
| 1,2-Dichloropropane | U | | 0.000306 | 0.00100 |
| cis-1,3-Dichloropropene | U | | 0.000418 | 0.00100 |
| trans-1,3-Dichloropropene | U | | 0.000419 | 0.00100 |
| Ethylbenzene | U | | 0.000384 | 0.00100 |
| 2-Hexanone | U | | 0.00382 | 0.0100 |
| 2-Butanone (MEK) | U | | 0.00393 | 0.0100 |
| Methylene Chloride | U | | 0.00100 | 0.00500 |
| 4-Methyl-2-pentanone (MIBK) | U | | 0.00214 | 0.0100 |
| Styrene | U | | 0.000307 | 0.00100 |
| 1,1,2,2-Tetrachloroethane | U | | 0.000130 | 0.00100 |
| Tetrachloroethene | U | | 0.000372 | 0.00100 |
| Toluene | U | | 0.000412 | 0.00100 |
| 1,1,1-Trichloroethane | U | | 0.000319 | 0.00100 |
| 1,1,2-Trichloroethane | U | | 0.000383 | 0.00100 |
| Trichloroethene | U | | 0.000398 | 0.00100 |
| Vinyl acetate | U | | 0.00163 | 0.0100 |
| Vinyl chloride | U | | 0.000259 | 0.00100 |
| Xylenes, Total | U | | 0.00106 | 0.00300 |
| o-Xylene | U | | 0.000341 | 0.00100 |
| m&p-Xylenes | U | | 0.000719 | 0.00200 |
| (S) Toluene-d8 | 106 | | | 80.0-120 |
| (S) 4-Bromofluorobenzene | 97.9 | | | 77.0-126 |

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Tr

⁶ Sr

⁷ Qc

⁸ Gl

⁹ Al

¹⁰ Sc



Method Blank (MB)

(MB) R3425591-3 06/27/19 21:49

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---------------------------|-------------------|--------------|----------------|----------------|
| (S) 1,2-Dichloroethane-d4 | 98.2 | | | 70.0-130 |

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3425591-1 06/27/19 20:48 • (LCSD) R3425591-2 06/27/19 21:09

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCSD Result mg/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|-----------------------------|----------------------|--------------------|---------------------|---------------|----------------|------------------|---------------|----------------|----------|-----------------|
| Acetone | 0.125 | 0.105 | 0.105 | 84.2 | 84.2 | 19.0-160 | | | 0.0231 | 27 |
| Benzene | 0.0250 | 0.0237 | 0.0226 | 94.8 | 90.6 | 70.0-123 | | | 4.53 | 20 |
| Bromodichloromethane | 0.0250 | 0.0235 | 0.0224 | 93.8 | 89.8 | 75.0-120 | | | 4.40 | 20 |
| Bromochloromethane | 0.0250 | 0.0233 | 0.0207 | 93.2 | 82.8 | 76.0-122 | | | 11.8 | 20 |
| Bromoform | 0.0250 | 0.0257 | 0.0265 | 103 | 106 | 68.0-132 | | | 2.76 | 20 |
| Bromomethane | 0.0250 | 0.00623 | 0.0124 | 24.9 | 49.5 | 10.0-160 | | J3 | 66.0 | 25 |
| Carbon disulfide | 0.0250 | 0.0236 | 0.0232 | 94.6 | 92.9 | 61.0-128 | | | 1.76 | 20 |
| Carbon tetrachloride | 0.0250 | 0.0245 | 0.0247 | 98.1 | 98.7 | 68.0-126 | | | 0.638 | 20 |
| Chlorobenzene | 0.0250 | 0.0245 | 0.0250 | 98.2 | 99.9 | 80.0-121 | | | 1.76 | 20 |
| Chlorodibromomethane | 0.0250 | 0.0256 | 0.0270 | 102 | 108 | 77.0-125 | | | 5.39 | 20 |
| Chloroethane | 0.0250 | 0.0259 | 0.0246 | 103 | 98.4 | 47.0-150 | | | 5.04 | 20 |
| Chloroform | 0.0250 | 0.0237 | 0.0232 | 95.0 | 92.8 | 73.0-120 | | | 2.29 | 20 |
| Chloromethane | 0.0250 | 0.0113 | 0.0119 | 45.2 | 47.6 | 41.0-142 | | | 5.07 | 20 |
| 1,1-Dichloroethane | 0.0250 | 0.0235 | 0.0231 | 94.0 | 92.3 | 70.0-126 | | | 1.76 | 20 |
| 1,2-Dichloroethane | 0.0250 | 0.0240 | 0.0228 | 95.8 | 91.1 | 70.0-128 | | | 5.02 | 20 |
| 1,1-Dichloroethene | 0.0250 | 0.0250 | 0.0252 | 100 | 101 | 71.0-124 | | | 0.679 | 20 |
| cis-1,2-Dichloroethene | 0.0250 | 0.0249 | 0.0244 | 99.6 | 97.6 | 73.0-120 | | | 2.00 | 20 |
| trans-1,2-Dichloroethene | 0.0250 | 0.0258 | 0.0250 | 103 | 99.8 | 73.0-120 | | | 3.42 | 20 |
| 1,2-Dichloropropane | 0.0250 | 0.0242 | 0.0233 | 96.9 | 93.2 | 77.0-125 | | | 3.97 | 20 |
| cis-1,3-Dichloropropene | 0.0250 | 0.0243 | 0.0239 | 97.2 | 95.4 | 80.0-123 | | | 1.83 | 20 |
| trans-1,3-Dichloropropene | 0.0250 | 0.0249 | 0.0257 | 99.5 | 103 | 78.0-124 | | | 3.28 | 20 |
| Ethylbenzene | 0.0250 | 0.0248 | 0.0250 | 99.3 | 99.9 | 79.0-123 | | | 0.648 | 20 |
| 2-Hexanone | 0.125 | 0.124 | 0.130 | 99.1 | 104 | 67.0-149 | | | 5.13 | 20 |
| 2-Butanone (MEK) | 0.125 | 0.119 | 0.116 | 95.0 | 93.1 | 44.0-160 | | | 2.07 | 20 |
| Methylene Chloride | 0.0250 | 0.0235 | 0.0233 | 94.2 | 93.2 | 67.0-120 | | | 0.987 | 20 |
| 4-Methyl-2-pentanone (MIBK) | 0.125 | 0.125 | 0.129 | 99.7 | 103 | 68.0-142 | | | 3.36 | 20 |
| Styrene | 0.0250 | 0.0254 | 0.0270 | 102 | 108 | 73.0-130 | | | 6.11 | 20 |
| 1,1,2,2-Tetrachloroethane | 0.0250 | 0.0225 | 0.0218 | 90.0 | 87.3 | 65.0-130 | | | 3.09 | 20 |
| Tetrachloroethene | 0.0250 | 0.0257 | 0.0262 | 103 | 105 | 72.0-132 | | | 1.95 | 20 |
| Toluene | 0.0250 | 0.0232 | 0.0239 | 92.6 | 95.5 | 79.0-120 | | | 3.03 | 20 |
| 1,1,1-Trichloroethane | 0.0250 | 0.0262 | 0.0251 | 105 | 101 | 73.0-124 | | | 4.14 | 20 |
| 1,1,2-Trichloroethane | 0.0250 | 0.0239 | 0.0245 | 95.7 | 98.0 | 80.0-120 | | | 2.46 | 20 |

1 Cp

2 Tc

3 Ss

4 Cn

5 Tr

6 Sr

7 Qc

8 Gl

9 Al

10 Sc



Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3425591-1 06/27/19 20:48 • (LCSD) R3425591-2 06/27/19 21:09

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCSD Result mg/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | <u>LCS Qualifier</u> | <u>LCSD Qualifier</u> | RPD % | RPD Limits % |
|---------------------------|----------------------|--------------------|---------------------|---------------|----------------|------------------|----------------------|-----------------------|----------|-----------------|
| Trichloroethene | 0.0250 | 0.0239 | 0.0252 | 95.6 | 101 | 78.0-124 | | | 5.32 | 20 |
| Vinyl acetate | 0.125 | 0.121 | 0.115 | 97.0 | 91.6 | 11.0-160 | | | 5.67 | 20 |
| Vinyl chloride | 0.0250 | 0.0227 | 0.0223 | 90.8 | 89.1 | 67.0-131 | | | 1.90 | 20 |
| Xylenes, Total | 0.0750 | 0.0726 | 0.0753 | 96.8 | 100 | 79.0-123 | | | 3.65 | 20 |
| o-Xylene | 0.0250 | 0.0238 | 0.0250 | 95.1 | 100 | 80.0-122 | | | 5.18 | 20 |
| m&p-Xylenes | 0.0500 | 0.0488 | 0.0503 | 97.7 | 101 | 80.0-122 | | | 2.96 | 20 |
| (S) Toluene-d8 | | | | 98.2 | 99.9 | 80.0-120 | | | | |
| (S) 4-Bromofluorobenzene | | | | 93.0 | 102 | 77.0-126 | | | | |
| (S) 1,2-Dichloroethane-d4 | | | | 110 | 107 | 70.0-130 | | | | |

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Tr
- 6 Sr
- 7 Qc
- 8 Gl
- 9 Al
- 10 Sc



Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

| | |
|------------------------------|--|
| MDL | Method Detection Limit. |
| MQL | Method Quantitation Limit. |
| RDL | Reported Detection Limit. |
| Rec. | Recovery. |
| RPD | Relative Percent Difference. |
| SDG | Sample Delivery Group. |
| SDL | Sample Detection Limit. |
| (S) | Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media. |
| U | Not detected at the Sample Detection Limit. |
| Unadj. MQL | Unadjusted Method Quantitation Limit. |
| Analyte | The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported. |
| Dilution | If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor. |
| Limits | These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges. |
| Qualifier | This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable. |
| Result | The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte. |
| Uncertainty (Radiochemistry) | Confidence level of 2 sigma. |
| Case Narrative (Cn) | A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report. |
| Quality Control Summary (Qc) | This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material. |
| Sample Chain of Custody (Sc) | This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis. |
| Sample Results (Sr) | This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported. |
| Sample Summary (Ss) | This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis. |

| Qualifier | Description |
|-----------|--|
| J | The identification of the analyte is acceptable; the reported value is an estimate. |
| J3 | The associated batch QC was outside the established quality control range for precision. |

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Tr
- 6 Sr
- 7 Qc
- 8 Gl
- 9 Al
- 10 Sc



Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
 * Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

| | | | |
|-------------------------|-------------|-----------------------------|------------------|
| Alabama | 40660 | Nebraska | NE-OS-15-05 |
| Alaska | 17-026 | Nevada | TN-03-2002-34 |
| Arizona | AZ0612 | New Hampshire | 2975 |
| Arkansas | 88-0469 | New Jersey-NELAP | TN002 |
| California | 2932 | New Mexico ¹ | n/a |
| Colorado | TN00003 | New York | 11742 |
| Connecticut | PH-0197 | North Carolina | Env375 |
| Florida | E87487 | North Carolina ¹ | DW21704 |
| Georgia | NELAP | North Carolina ³ | 41 |
| Georgia ¹ | 923 | North Dakota | R-140 |
| Idaho | TN00003 | Ohio-VAP | CL0069 |
| Illinois | 200008 | Oklahoma | 9915 |
| Indiana | C-TN-01 | Oregon | TN200002 |
| Iowa | 364 | Pennsylvania | 68-02979 |
| Kansas | E-10277 | Rhode Island | LA000356 |
| Kentucky ^{1,6} | 90010 | South Carolina | 84004 |
| Kentucky ² | 16 | South Dakota | n/a |
| Louisiana | AI30792 | Tennessee ^{1,4} | 2006 |
| Louisiana ¹ | LA180010 | Texas | T104704245-18-15 |
| Maine | TN0002 | Texas ⁵ | LAB0152 |
| Maryland | 324 | Utah | TN00003 |
| Massachusetts | M-TN003 | Vermont | VT2006 |
| Michigan | 9958 | Virginia | 460132 |
| Minnesota | 047-999-395 | Washington | C847 |
| Mississippi | TN00003 | West Virginia | 233 |
| Missouri | 340 | Wisconsin | 9980939910 |
| Montana | CERT0086 | Wyoming | A2LA |

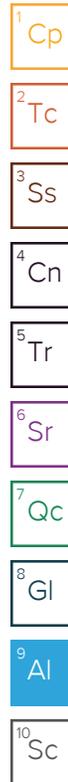
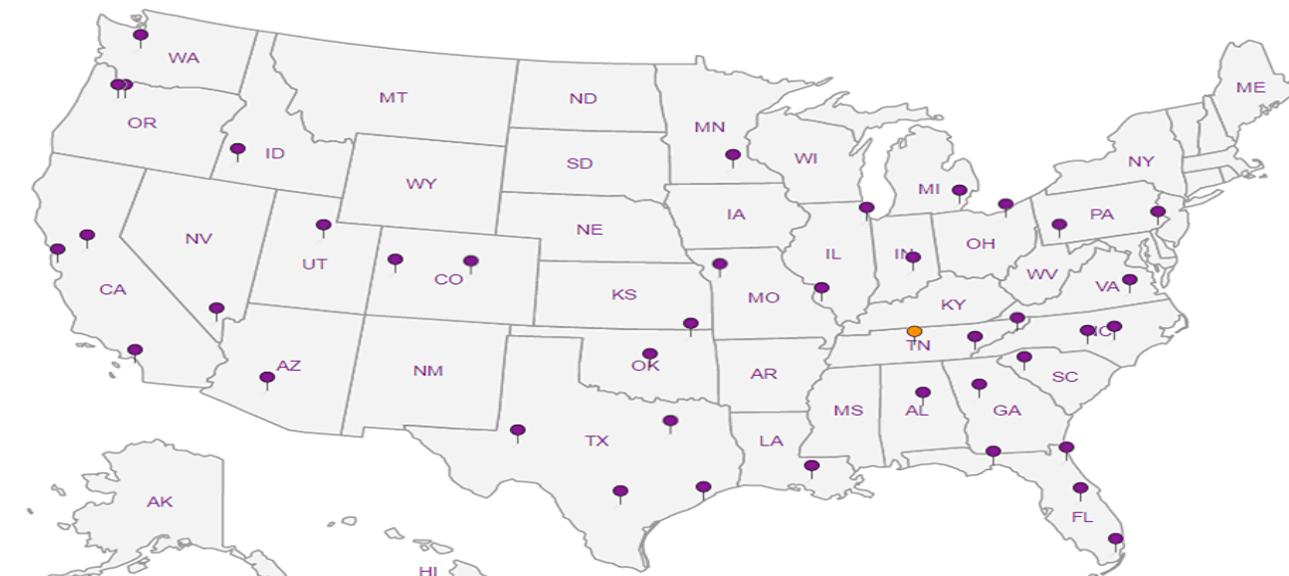
Third Party Federal Accreditations

| | | | |
|-------------------------------|---------|--------------------|---------------|
| A2LA – ISO 17025 | 1461.01 | AIHA-LAP,LLC EMLAP | 100789 |
| A2LA – ISO 17025 ⁵ | 1461.02 | DOD | 1461.01 |
| Canada | 1461.01 | USDA | P330-15-00234 |
| EPA-Crypto | TN00003 | | |

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.





A079

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Houston, TX 77099
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F: +1 281 530 5887
www.alsglobal.com

L1113340

Subcontract Chain of Custody

SAMPLING STATE: Texas

COC ID: 11677

SUBCONTRACT TO:

Pace Analytical
12065 Lebanon Road
Mount Juliet, TN 37122-2508

Phone: +1 (61) 7 8-58

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: Dane J. Wacasey
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: Dane.Wacasey@alsglobal.com
Alternate Contact: Jumoke M. Lawal
Email: jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS19061365
TSR: Houston House Acct

| LAB SAMPLE ID | CLIENT SAMPLE ID | MATRIX | COLLECT DATE |
|--------------------|-----------------------------|--------|-------------------|
| ANALYSIS REQUESTED | | | DUE DATE |
| 1. HS19061365-01 | WSW-1620-NCS_Water-20190626 | Water | 26 Jun 2019 11:20 |
| | SUB_VOC | | 28 Jun 2019 |

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

Attn Mark Beasley

QC Level: STD (Laboratory Standard QC: method blank and LCS required)

RAD SCREEN: <0.5 mR/hr

1.5 + 0.3 = 1.8 ^{ppd} A2

COC 51

Relinquished By: _____

Date/Time: 6/26/19 1800

Received By: _____

Date/Time: 6-26-19 8:45

Cooler ID(s): _____

Temperature(s): _____

4809 7835 3984

RIGHT SOLUTIONS | RIGHT PARTNER

26 Jun 2019

Page 1 of 1

L113340

UPRR Planning Electronic data Deliverable (PEDD) for Analytical Services

Project Name (Use On Lab Invoice): Houston TX-Wood Preserving Works
UPRR Facility Number: 1620
Facility Code (Use for LEDD Upload) HoustonTX-Wood

Phase/Study Title: Waste Characterization
Event Description: Tote waste characterization
PEDD Ref No.: 1620-08-Rev1

Analytical Parameter Analytes Targeted Reporting Limits Action Limits (if applicable) Units

VOCs 8260

- Acetone
- Benzene
- Chlorobromomethane
- Bromoform
- Bromomethane
- 2-Butanone (MEK)
- Carbon disulfide
- Carbon tetrachloride
- Dibromochloromethane
- Chlorobenzene
- Chloroethane
- Chloroform
- Chloromethane
- 1,1-Dichloroethane
- 1,2-Dichloroethane
- 1,1-Dichloroethene
- cis-1,2-Dichloroethene
- trans-1,2-Dichloroethene
- 1,2-Dichloropropane
- cis-1,3-Dichloropropene
- trans-1,3-Dichloropropene
- Ethylbenzene
- 2-Hexanone
- Methylene Chloride
- 4-Methyl-2-pentanone (MIBK)
- Styrene
- 1,1,2,2-Tetrachloroethane
- Tetrachloroethene
- Toluene
- 1,1,1-Trichloroethane
- 1,1,2-Trichloroethane
- Trichloroethene
- Vinyl acetate
- Vinyl chloride
- o-Xylene
- m-Xylene & p-Xylene
- Xylenes, Total
- Bromodichloromethane
- 1,2-Dichloroethene, Total