



August 19, 2020

Project No. 19119232

**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 2020 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 and Englewood Intermodal Yard concrete pavement near the collection system for July 2020 (photographs of from the weekly inspections are provided in Attachment A):

- Less than 0.5 gallons of dense NAPL (DNAPL) were recovered from NAPL Collection Sump 1 (B099/B100 slots) during the month of July. No significant amount of NAPL has been visually observed or recovered from Sump 2 (B103/B104 slots) or Sump 3 (B107/B108 slots). Water continues to accumulate in the NAPL collection sumps. To slow water accumulation from surface runoff, new manhole covers without holes were installed on the NAPL collection sumps and new inflow protectors have been ordered.
- Water continues to collect more rapidly in Sump 1 compared to Sumps 2 or 3 following pump down events. All three Sumps were pumped down on July 1, 2020. The water level in the sump returned to the surface by the July 23<sup>rd</sup> weekly inspection and has remained at the top of the sump through July 31, 2020. Whereas water levels in Sumps 2 and 3 have recovered to 11 inches and 10 inches from

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the top of the sumps respectively as of July 31, 2020. The water in Sumps 1, 2, and 3 was observed as being brown in color but with no odor observed. A sheen was noted on the water in Sump 3 during the July 8, 2020 weekly inspection, and in Sump 1 during the July 15, 2020 weekly inspection.

- No seeps were noted during the month of July 2020 around the NAPL Collection Systems, except for a small amount of tar-like NAPL immediately adjacent to the NAPL Collection System in slot B103 on July 23, 2020 (see photolog). For areas outside the NAPL Collection System, very small amounts of tar-like material were noted on the concrete surface in stalls A010, A021, A022, B057, B096, B101, B102, B103, B105, and B108 where previous seeps have been observed. A new seep was observed in stall B042 during the July 23, 2020 inspection. While the amount of tar-like material seeping through the cracks and joints on a weekly basis varied, the overall amount of material recovered during July 2020 was similar to June 2020 with less than 1 gallon of the tar-like material recovered.
- Beginning in May 2020, brown staining and seep water was observed along asphalt joints and cracks throughout the B-Row (predominately in the B090 – B098 area) but was also observed within the A-Row. UPRR Contractor United States Environmental Services (USES) pressure washed the areas in May and collected the fluids, which were placed in a tote on site next to the frac tank used to temporarily store water pumped from the NAPL Collection sumps. A sample of the water in the tote was collected on June 11, 2020 for waste characterization. A copy of the analytical report is provided in Attachment B. However, no wide-spread seep water was observed during the weekly inspections in June or July 2020, and no pressure washing activities were conducted. UPRR will continue to have USES pressure wash the areas where the brown staining and seeps are observed as needed.
- During the week of July 13, 2020, Golder, on behalf of UPRR, coordinated with USES to excavate seven test pits in areas where historical NAPL seeps had been observed in the Englewood Intermodal Yard (Test Pits (TP) TP-01 (Slot B108), TP-02 (Slot A098), TP-03 (Slot B096), TP-04 (Slot B057), TP-05 (Slot A021), TP-06 (Slot B013), and TP-07 (Slot A010) (see Figure 1). Each test pit was dug to approximately 4 feet below ground surface and was approximately 5 feet long by 2 feet wide. The objectives for conducting the test pit excavations were to:
  - Evaluate the NAPL in the subsurface immediately below where the small NAPL surface seeps are located;
  - Evaluate the areas where brown water seeps had been observed, and
  - Assess if the NAPL surface seeps return following removal of the NAPL in the shallow subsurface at the test pit locations.

The test pits were excavated, left open for a few hours (or overnight), inspected for mobile NAPL entering into the test pit excavation, and backfilled and covered with a concrete patch. Soil samples were also collected from one of the sidewalls of each test pit. Since the excavation and backfilling of the test pits (July 13-16) through the July 31, 2020 inspection, no NAPL seeps have been observed at the test pits locations. The test pit locations will be inspected on a weekly basis and Golder, on behalf of UPRR, will prepare a summary report of the test pit findings including weekly inspections for three months for submittal to the TCEQ.

Weekly site inspections of the NAPL Collection System and Englewood Intermodal Yard concrete pavement near the collection system will continue to be conducted. In response to the TCEQ letter dated August 9, 2019, a notation on the presence of NAPL in each sump and tabulation of depth and thickness of NAPL if detected, and a tabulation of total mass of NAPL recovered from each sump is provided. The requested information is provided

on the enclosed Table 1. Through July 2020, no measurable NAPL has been detected in the sumps using the interface probe.

If you have any questions or need additional information, please feel free to call us 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*



Eric Pastor, P.E.  
*Principal / Program Leader*

ECM

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

Attachment Table 1 – NAPL Measurements – NAPL Collection System Sumps  
Weekly Inspection Photolog  
Laboratory Analytical Report

[https://golderassociates.sharepoint.com/sites/116841/project files/6 deliverables/pracr/tceq comment letter/2020-07 july monthly update/houston, tx-wpw-sw 31547 - monthly status update - cap repairs 202007-draft.docx](https://golderassociates.sharepoint.com/sites/116841/project%20files/6%20deliverables/pracr/tceq%20comment%20letter/2020-07%20july%20monthly%20update/houston,%20tx-wpw-sw-31547-monthly%20status%20update-cap%20repairs%20202007-draft.docx)

**TABLE**

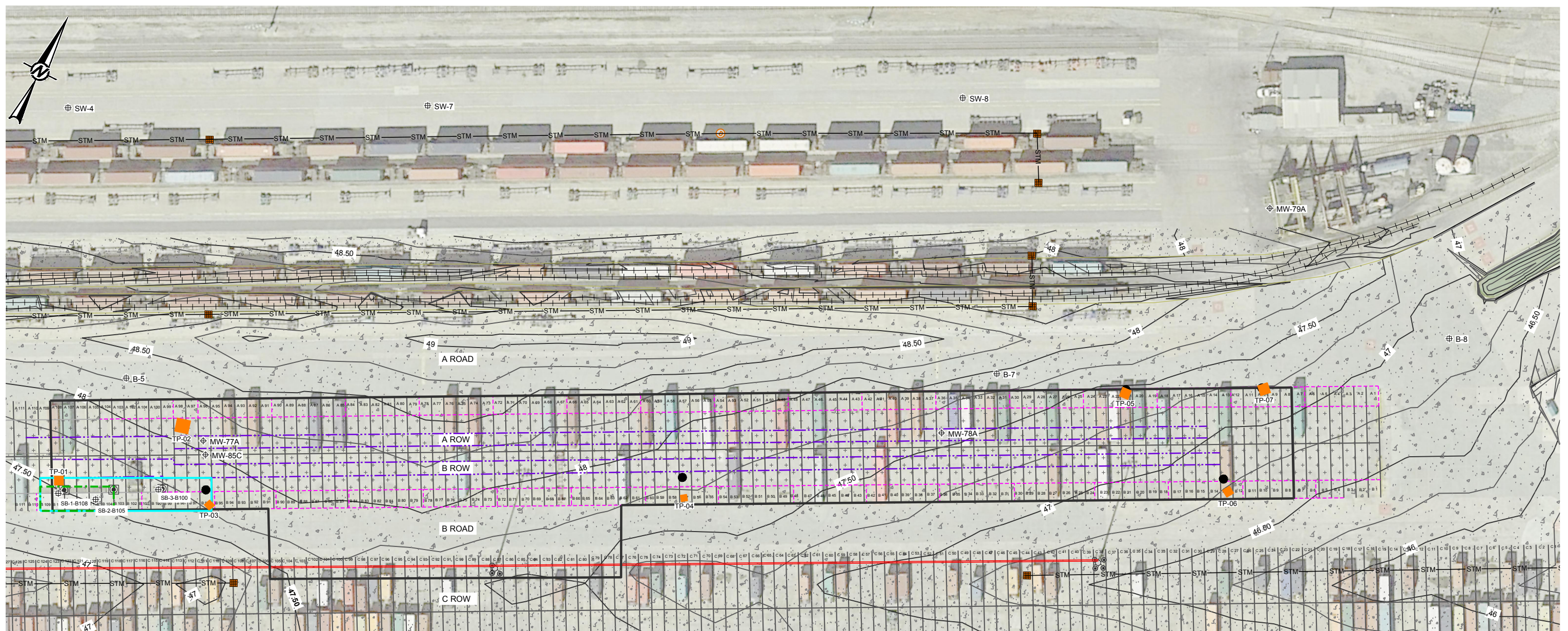
**TABLE 1**  
**NAPL Measurements - NAPL Collection System - Englewood Intermodal Yard**  
**UPRR Houston, tx - Wood Preserving Works**

Measured Date	Sump 1 (B099/B100) Freeboard (in)	Sump 2 (B103/B104) Freeboard (in)	Sump 3 (B107/B108) Freeboard (in)	Depth to DNAPL (in)	Comments
8/14/2019	2.5	28	29	Not measurable	
8/21/2019	0	27.5	26.5	Not measurable	
8/28/2019	44.5	47.9	45	Not measurable	Water from sumps pumped out
9/4/2019	19	42	41.5	Not measurable	
9/13/2019	0	39.5	38	Not measurable	
9/20/2019	0	3	2.5	Not measurable	
9/25/2019	0	42	42.5	Not measurable	Water from sumps pumped out
10/2/2019	2.5	42.5	42	Not measurable	Sheen visible in B107/B108 sump, less than 0.1 gal of DNAPL recovered
10/9/2019	3	42	41.5	Not measurable	Sheen visible in B107/B108 sump, less than 0.1 gal of DNAPL recovered
10/16/2019	0	39.5	39	Not measurable	Less than 0.1 gal of DNAPL recovered from B107/B108 Sump
10/24/2019	3	35	25	Not measurable	Less than 0.1 gal of DNAPL recovered from B107/B108 Sump
10/29/2019	0	24	23	Not measurable	Water from sumps pumped out
10/30/2019	0	40	39	Not measurable	Slight sheen visible in B107/B108 sump
11/6/2019	9	39	38.5	Not measurable	
11/13/2019	7	30	29	Not measurable	Less than 0.1 gal of DNAPL recovered from B107/B108 Sump
11/19/2019	4	26	25.5	Not measurable	
11/27/2019	0	25	23	Not measurable	
12/3/2019	2	25.5	25	Not measurable	Less than 0.1 gal of DNAPL recovered from B107/B108 Sump
12/11/2019	1.5	17	16.54	Not measurable	Less than 0.1 gal of DNAPL recovered from B107/B108 Sump
12/17/2019	5	19.5	17.5	Not measurable	
12/23/2019	10	21	20.5	Not measurable	
1/7/2020	9	13	12.5	Not measurable	
1/8/2020	9	13	12.5	Not measurable	Water from sumps pumped out
1/17/2020	0	32	31.5	Not measurable	
1/21/2020	2.5	26.5	26	Not measurable	
1/28/2020	0	0	0	Not measurable	
2/4/2020	2	11	10.5	Not measurable	
2/12/2020	0	0	0	Not measurable	
2/18/2020	1.5	11.5	10.25	Not measurable	Water from sumps pumped out on 2/20/2020
2/27/2020	2	42	36	Not measurable	
3/6/2020	1	36	36	Not measurable	
3/11/2020	2	36	35.5	Not measurable	
3/18/2020	0	35.5	35	Not measurable	
3/27/2020	0	29	28	Not measurable	
4/3/2020	1.5	29	28.5	Not measurable	
4/8/2020	0	23	22	Not measurable	
4/15/2020	0.5	23	22	Not measurable	
4/21/2020	0	21	21	Not measurable	
4/28/2020	0	23	22	Not measurable	
5/4/2020	-	-	-	Not Measured	Measurements were not taken; the inspector was unable to open the sumps
5/12/2020	0	20	19	Not measurable	
5/19/2020	0	15.75	14.25	Not measurable	Sump 1 pumped down (May 22nd)
5/27/2020	0	14	13	Not measurable	
6/1/2020	0	7	5	Not measurable	
6/10/2020	0	10	9	Not measurable	
6/17/2020	1	12	11	Not measurable	
6/25/2020	0	0	0	Not measurable	
6/30/2020	0	0	0	Not Measured	
7/1/2020	48	46	47	Not measurable	Sumps 1, 2, & 3 pumped down
7/8/2020	34	24.5	24	Not measurable	Less than 0.1 gal of DNAPL recovered from B107/B108 Sump
7/15/2020	32	29.5	29	Not measurable	Sheen visible in B99/B100 sump & B107/B108 sump, less than 0.1 gal of DNAPL recovered B107/B108 sump
7/23/2020	0	23	22.5	Not Measured	Less than 0.1 gal of DNAPL recovered from B107/B108 Sump
7/31/2020	0	11	10	Not measurable	

Note:  
Freeboard in sumps is measured as depth to water from top rim of sump, measured in inches

**FIGURE**

Path: \\usar\trans\inf\inf\proj\Houston\Wood\Preserving\Works\2019-06\June\PRODUCTION\1 - File Name: Enginwood Intermodal Capped Area Seeps.dwg | Last Edited By: adammond | Date: 2020-08-05 | Time: 11:14:54 AM | Printed By: adammond | Date: 2020-08-05 | Time: 2:15:20 PM

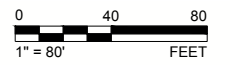


LEGEND	
	EXISTING CONCRETE
	EXISTING ASPHALT
	EXISTING MAJOR CONTOURS
	EXISTING MINOR CONTOURS
	EXISTING STORMWATER DRAIN LINE
	EXISTING RAIL SPURS
	EXISTING 1 1/2" WIDE EXPANSION/CONSTRUCTION JOINTS (4,550 LF)
	EXISTING LONGITUDINAL ASPHALT CRACKING (3,692 LF)
	EXISTING PARKING STALL STRIPE
	EXISTING 2 in ELECTRICAL CONDUIT (PVC SCH 80 OR HDPE OF EQUIVALENT THICKNESS)
	EXISTING LIGHT POLE
	EXISTING BOLLARD
	EXISTING STORMWATER INLET
	EXISTING NAPL COLLECTION SUMP
	EXISTING MONITORING WELLS
	EXISTING SOIL BORING LOCATIONS
	EXISTING NAPL COLLECTION SYSTEM (CONSTRUCTED FEB. 2019)
	APPROXIMATE AREA OF BROWN WATER SEEPS
	HISTORICAL NAPL SEEP AREA
	HISTORICAL NAPL SEEP LOCATION
	TEST PIT LOCATION

**REFERENCE(S)**  
 BASE MAP TAKEN FROM GOOGLE EARTH, DATED 02-23-2019  
 SURVEY BY: SURVEYING AND MAPPING, LLC (SAM)  
 1019 CENTRAL PARKWAY NORTH SUITE 104  
 SAN ANTONIO, TEXAS 78232

**NOTE(S)**

1. THE SURVEYED INFORMATION DEPICTED HEREON IS BASED ON TEXAS SOUTH CENTRAL USING TEXAS COORDINATE SYSTEM, NAD27 TEXAS STATE PLANE, SOUTH CENTRAL ZONE. ALL DISTANCES ARE REPRESENTED IN GRID VALUES, MEASURED IN U.S. SURVEY FEET, AND ARE BASED ON SAID HORIZONTAL DATUM.
2. ELEVATIONS SHOWN HEREON ARE PURSUANT TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) (GEOID 128).
3. UNDERGROUND UTILITIES SHOW HEREON ARE APPROXIMATE BASED ON A RIGHT-OF-WAY AND TRACK MAP PROVIDED FOR INFORMATION. ALWAYS CALL 811 BEFORE YOU DIG.



CLIENT  
 UNION PACIFIC RAILROAD CO.

PROJECT  
 HOUSTON WOOD PRESERVING WORKS  
 ENGLEWOOD INTERMODAL YARD

TITLE  
**NAPL AND BROWN SEEPAGE AREAS**

CONSULTANT	DATE	REVISION
	YYYY-MM-DD	2020-07-29
	DESIGNED	AJD
	PREPARED	AJD
	REVIEWED	BS
	APPROVED	ECM

PROJECT NO. 19119232      REV. 0      FIGURE 1

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

**ATTACHMENT A**

## Weekly Inspection Photolog





# PHOTOGRAPHIC LOG

**Client Name:**  
**Union Pacific Railroad**

**Site Location:**  
Englewood Houston, Texas

**Project No.**  
19119232

**Photo No.**  
**1**

**Date:**  
07/01/2020

**Description:**

Frac tank for storage of pumped down water from NAPL Collection Sumps (in Slot B110) and tote for storage of recovered pressure wash water/brown water, water from recent rain event on pavement, looking northwest.

Lat: 29.7841028  
Long: - 95.3209833



**Photo No.**  
**2**

**Date:**  
07/01/2020

**Description:**

Slot A021, very small amount of tar-like material seeping at joint, material was removed.

Lat: 29.785392,  
Long: -95.318655





# PHOTOGRAPHIC LOG

<b>Client Name:</b> Union Pacific Railroad	<b>Site Location:</b> Englewood Houston, Texas	<b>Project No.:</b> 19119232
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<b>Photo No.:</b> 3	<b>Date:</b> 07/01/2020
<b>Description:</b>  Slot B096, very small amount of tar-like material seeping at joint, material was removed.  Lat: 29.7842528 Long: - 95.3206250	



<b>Photo No.:</b> 4	<b>Date:</b> 07/01/2020
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<b>Description:</b>  Slot B101, no tar-like material seeps observed, looking north.  Lat: 29.784275 Long: - 95.320813	
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# PHOTOGRAPHIC LOG

<b>Client Name:</b> Union Pacific Railroad	<b>Site Location:</b> Englewood Houston, Texas	<b>Project No.:</b> 19119232
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<b>Photo No.:</b> 5	<b>Date:</b> 07/01/2020
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**Description:**

Slot B108, view of NAPL Collection System (Sump 107/108 in background). No tar-like material seeps observed, looking north.

Lat: 29.784125  
Long: - 95.320989



<b>Photo No.:</b> 6	<b>Date:</b> 07/01/2020
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**Description:**

Sump 1 (B099/B100), pump down was conducted by USES.

Lat: 29.7844000  
Long: - 95.3205861





# PHOTOGRAPHIC LOG

<b>Client Name:</b> <b>Union Pacific Railroad</b>	<b>Site Location:</b> Englewood Houston, Texas	<b>Project No.</b> 19119232
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<b>Photo No.</b> <b>7</b>	<b>Date:</b> 07/08/2020
<b>Description:</b>  Slot A010, very small amount of tar-like material seeping at joint, material was removed.  Lat: 29.7855833, Long: -95.318375	





<b>Photo No.</b> <b>8</b>	<b>Date:</b> 07/08/2020
<b>Description:</b>  Slot B057, no tar-like material seeps observed.  Lat: 29.7847472 Long: - 95.3195417	





# PHOTOGRAPHIC LOG

<b>Client Name:</b> Union Pacific Railroad		<b>Site Location:</b> Englewood Houston, Texas	<b>Project No.:</b> 19119232
<b>Photo No.:</b> 9	<b>Date:</b> 07/08/2020		
<b>Description:</b>  Slot B104, view of NAPL Collection System (Sump 103/104 in foreground). No tar-like material seeps observed, looking north.  Lat: 29.7841639 Long: - 95.3208694			
<b>Photo No.:</b> 10	<b>Date:</b> 07/08/2020		
<b>Description:</b>  Sump 2 (B103/B104), 24.5 inches of freeboard in sump, no sheen or odors noted.  Lat: 29.7842861 Long: - 95.3208611			



# PHOTOGRAPHIC LOG

<b>Client Name:</b> Union Pacific Railroad	<b>Site Location:</b> Englewood Houston, Texas	<b>Project No.:</b> 19119232
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<b>Photo No.</b> 11	<b>Date:</b> 07/08/2020
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**Description:**

Slot B108, small amount of tar-like material seeping at asphalt crack, material was removed.

Lat: 29.784125  
Long: - 95.320989



<b>Photo No.</b> 12	<b>Date:</b> 07/08/2020
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**Description:**

Sump 3 (B107/B108), 24 inches of freeboard in sump, sheen noted. 8 ounces of tar-like material recovered.

Lat: 29.7842861  
Long: - 95.3208611





# PHOTOGRAPHIC LOG

**Client Name:**  
**Union Pacific Railroad**

**Site Location:**  
Englewood Houston, Texas

**Project No.**  
19119232

**Photo No.**  
**13**

**Date:**  
07/08/2020

**Description:**

Slot B096-B110, residual brown staining observed along the crack in the asphalt, NAPL Collection System in background, looking west.

Lat: 29.784402  
Long: -95.320520



**Photo No.**  
**14**

**Date:**  
07/08/2020

**Description:**

Slot B105, small amount of tar-like material seeping at asphalt crack, material was removed.

Lat: 29.7841472  
Long: - 95.3208777





**Client Name:**  
**Union Pacific Railroad**

**Site Location:**  
Englewood Houston, Texas

**Project No.**  
19119232

**Photo No.**  
**15**

**Date:**  
07/15/2020

**Description:**

Slot A010, test pit construction completed, pit backfilled and preparing for concrete patch.

Lat: 29.7855833,  
Long: -95.318375



**Photo No.**  
**16**

**Date:**  
07/15/2020

**Description:**

Slot B101, small amount of tar-like material seeping at asphalt crack. Material was removed.

Lat: 29.784275  
Long: - 95.320813







# PHOTOGRAPHIC LOG

**Client Name:**  
**Union Pacific Railroad**

**Site Location:**  
Englewood Houston, Texas

**Project No.**  
19119232

**Photo No.**  
**17**

**Date:**  
07/15/2020

**Description:**

Sump B107/B108, 1 ounce of tar-like material recovered. 32 inches of freeboard in sump, sheen noted on water in sump.

Lat: 29.7842861  
Long: - 95.3208611



**Photo No.**  
**18**

**Date:**  
07/15/2020

**Description:**

Slot B096, test pit construction completed, finishing out concrete patch.

Lat: 29.7842528  
Long: - 95.3206250





# PHOTOGRAPHIC LOG

<b>Client Name:</b> <b>Union Pacific Railroad</b>	<b>Site Location:</b> Englewood Houston, Texas	<b>Project No.</b> 19119232
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<b>Photo No.</b> <b>19</b>	<b>Date:</b> 07/15/2020
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**Description:**

Slot B097, residual brown staining observed along the crack in the asphalt, looking north.

Lat: 29.784236  
Long: -95.320642



<b>Photo No.</b> <b>20</b>	<b>Date:</b> 07/15/2020
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**Description:**

Sump 1 (B099/B100), 32 inches of freeboard in sump, sheen noted. Sump was pumped down by USES on 7/1.

Lat: 29.7844000  
Long: - 95.3205861





# PHOTOGRAPHIC LOG

**Client Name:**  
**Union Pacific Railroad**

**Site Location:**  
Englewood Houston, Texas

**Project No.**  
19119232

**Photo No.**  
**21**

**Date:**  
07/23/2020

**Description:**

Slot B057, no tar-like material seeps observed, test pit construction complete.

Lat: 29.7847472  
Long: - 95.3195417



**Photo No.**  
**22**

**Date:**  
07/23/2020

**Description:**

Slot B042, small amount of tar-like material seeping at joint. Material was removed.

Lat: 29.784926  
Long: - 95.319124





# PHOTOGRAPHIC LOG

<b>Client Name:</b> Union Pacific Railroad	<b>Site Location:</b> Englewood Houston, Texas	<b>Project No.:</b> 19119232
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<b>Photo No.:</b> 23	<b>Date:</b> 07/23/2020
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**Description**

Slot B100, view of NAPL Collection System (Sump 099/100 in background). No tar-like material seeps observed, looking north.

Lat: 29.7842472  
Long: - 95.3206944



<b>Photo No.:</b> 24	<b>Date:</b> 07/23/2020
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**Description:**

Slot B102, small amount of tar-like material seeping at joint, material was removed.

Lat: 29.7842203  
Long: - 95.320827





# PHOTOGRAPHIC LOG

**Client Name:**  
**Union Pacific Railroad**

**Site Location:**  
Englewood Houston, Texas

**Project No.**  
19119232

**Photo No.**  
**25**

**Date:**  
07/23/2020

**Description:**

Slot B107, view of NAPL Collection System (Sump 3 (B107B/108) in background). Test pit construction underway in B108 (left). No tar-like material seeps observed, looking north.

Lat: 29.784125  
Long: - 95.320989



**Photo No.**  
**26**

**Date:**  
07/23/2020

**Description:**

Slot B103, very small amount of tar-like material seeping at joint. Material was removed.

Lat: 29.7842861  
Long: - 95.3208611





# PHOTOGRAPHIC LOG

**Client Name:**  
**Union Pacific Railroad**

**Site Location:**  
Englewood Houston, Texas

**Project No.**  
19119232

**Photo No.**  
**27**

**Date:**  
07/31/2020

**Description:**

Slot A022, no tar-like material seeps observed, looking south.

Lat: 29.785392,  
Long: -95.318655



**Photo No.**  
**28**

**Date:**  
07/31/2020

**Description:**

Slot B013, test pit construction complete, no tar-like material seeps observed, looking north.

Lat: 29.785217  
Long: - 95.318261





# PHOTOGRAPHIC LOG

**Client Name:**  
**Union Pacific Railroad**

**Site Location:**  
Englewood Houston, Texas

**Project No.**  
19119232

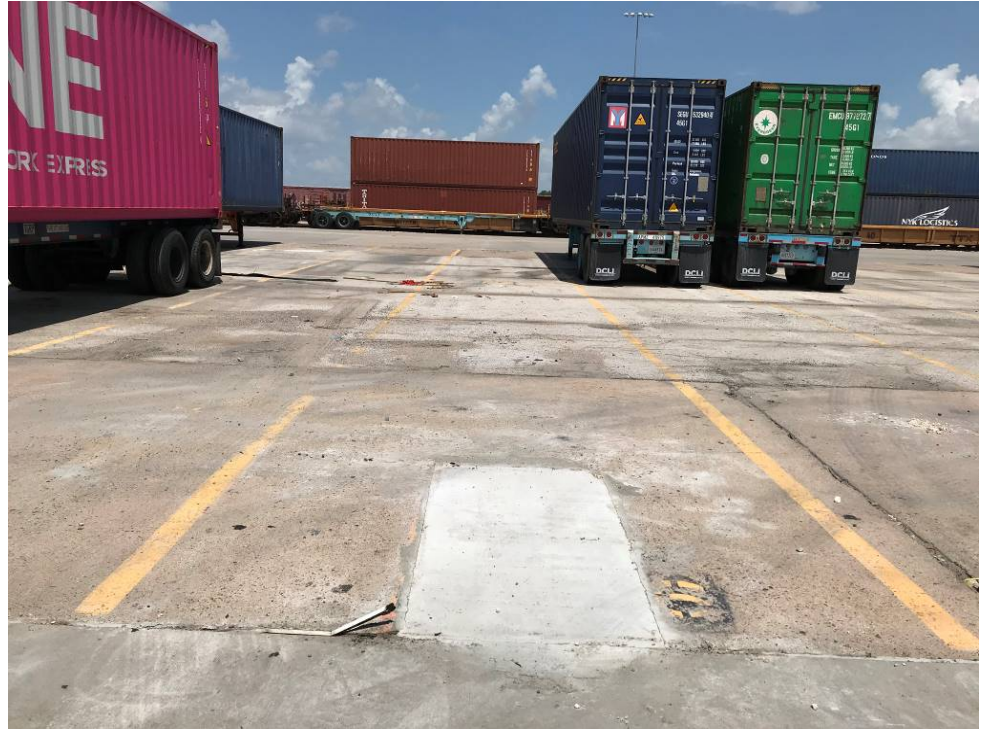
**Photo No.**  
**29**

**Date:**  
07/31/2020

**Description:**

Slot B096, test pit construction complete, no tar-like material seeps observed, looking north.

Lat: 29.7842528  
Long: - 95.3206250



**Photo No.**  
**30**

**Date:**  
07/31/2020

**Description:**

Slot B099, view of NAPL Collection System (Sump 1 099/100 in background). No tar-like material seeps observed, looking north.

Lat: 29.7842472  
Long: - 95.3206944





# PHOTOGRAPHIC LOG

<b>Client Name:</b> Union Pacific Railroad	<b>Site Location:</b> Englewood Houston, Texas	<b>Project No.:</b> 19119232
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<b>Photo No.</b> <b>31</b>	<b>Date:</b> 07/31/2020
<b>Description:</b>  Slot B101, very small amount of tar-like material seeping at asphalt crack. Material was removed.  Lat: 29.784275 Long: - 95.320813	



<b>Photo No.</b> <b>32</b>	<b>Date:</b> 07/31/2020
<b>Description:</b>  Slot B102, small amount of tar-like material seeping at joint, material was removed.  Lat: 29.7842203 Long: - 95.320827	





**ATTACHMENT B**

# Laboratory Analytical Report



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

June 23, 2020

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

Work Order: **HS20060631**

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

Dear Eric Matzner,

ALS Environmental received 1 sample(s) on Jun 11, 2020 for the analysis presented in the following report.

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

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

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

Sincerely,

A handwritten signature in black ink, appearing to read "Dane J. Wacasey".

Generated By: JUMOKE.LAWAL  
Dane J. Wacasey

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works IDW  
**Work Order:** HS20060631

**SAMPLE SUMMARY**

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Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20060631-01	WG-1620-IDWW01-20200611	Water		11-Jun-2020 12:00	11-Jun-2020 17:15	<input type="checkbox"/>

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works IDW  
**Work Order:** HS20060631

**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: 154500**

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

**GCMS Semivolatiles by Method SW8270****Batch ID: 154506****Sample ID: HS20060638-01MS**

- MS and MSD are for an unrelated sample

**Sample ID: WG-1620-IDWW01-20200611 (HS20060631-01)**

- 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: R363574****Sample ID: HS20060522-01MS**

- MS and MSD are for an unrelated sample

**Metals by Method SW7470****Batch ID: 154572**

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

**Metals by Method SW6020****Batch ID: 154557****Sample ID: HS20060577-01MS**

- MS and MSD are for an unrelated sample

**Sample ID: WG-1620-IDWW01-20200611 (HS20060631-01)**

- Sample ran at a 2X dilution due to sample matrix.

**WetChemistry by Method SW9040C****Batch ID: R363579**

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

**WetChemistry by Method SM4500 S2-F****Batch ID: R363578**

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

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**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works IDW  
**Work Order:** HS20060631

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**CASE NARRATIVE**

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**WetChemistry by Method SM4500 S2-F**

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**WetChemistry by Method SW1010**

**Batch ID: R363190**

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

**WetChemistry by Method SW9014**

**Batch ID: 154628**

- 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 IDW  
 Sample ID: WG-1620-IDWW01-20200611  
 Collection Date: 11-Jun-2020 12:00

**ANALYTICAL REPORT**  
 WorkOrder:HS20060631  
 Lab ID:HS20060631-01  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MLL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,1,1-Trichloroethane	U		0.00020	0.0010	mg/L	1	19-Jun-2020 06:46
1,1,2,2-Tetrachloroethane	U		0.00050	0.0010	mg/L	1	19-Jun-2020 06:46
1,1,2-Trichloroethane	U		0.00030	0.0010	mg/L	1	19-Jun-2020 06:46
1,1-Dichloroethane	U		0.00020	0.0010	mg/L	1	19-Jun-2020 06:46
1,1-Dichloroethene	U		0.00020	0.0010	mg/L	1	19-Jun-2020 06:46
1,2-Dichlorobenzene	U		0.00050	0.0010	mg/L	1	19-Jun-2020 06:46
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	19-Jun-2020 06:46
1,2-Dichloropropane	U		0.00050	0.0010	mg/L	1	19-Jun-2020 06:46
1,3-Dichlorobenzene	U		0.00040	0.0010	mg/L	1	19-Jun-2020 06:46
1,4-Dichlorobenzene	U		0.00040	0.0010	mg/L	1	19-Jun-2020 06:46
2-Butanone	U		0.00050	0.0020	mg/L	1	19-Jun-2020 06:46
2-Hexanone	U		0.0010	0.0020	mg/L	1	19-Jun-2020 06:46
4-Methyl-2-pentanone	U		0.00070	0.0020	mg/L	1	19-Jun-2020 06:46
Acetone	U		0.0020	0.0020	mg/L	1	19-Jun-2020 06:46
Benzene	U		0.00020	0.0010	mg/L	1	19-Jun-2020 06:46
Bromochloromethane	U		0.00020	0.0010	mg/L	1	19-Jun-2020 06:46
Bromodichloromethane	U		0.00020	0.0010	mg/L	1	19-Jun-2020 06:46
Bromoform	U		0.00040	0.0010	mg/L	1	19-Jun-2020 06:46
Bromomethane	U		0.00040	0.0010	mg/L	1	19-Jun-2020 06:46
Carbon disulfide	U		0.00060	0.0020	mg/L	1	19-Jun-2020 06:46
Carbon tetrachloride	U		0.00050	0.0010	mg/L	1	19-Jun-2020 06:46
Chlorobenzene	U		0.00030	0.0010	mg/L	1	19-Jun-2020 06:46
Chloroethane	U		0.00030	0.0010	mg/L	1	19-Jun-2020 06:46
Chloroform	U		0.00020	0.0010	mg/L	1	19-Jun-2020 06:46
Chloromethane	U		0.00020	0.0010	mg/L	1	19-Jun-2020 06:46
cis-1,2-Dichloroethene	U		0.00020	0.0010	mg/L	1	19-Jun-2020 06:46
cis-1,3-Dichloropropene	U		0.00010	0.0010	mg/L	1	19-Jun-2020 06:46
Dibromochloromethane	U		0.00030	0.0010	mg/L	1	19-Jun-2020 06:46
Ethylbenzene	U		0.00030	0.0010	mg/L	1	19-Jun-2020 06:46
m,p-Xylene	U		0.00050	0.0020	mg/L	1	19-Jun-2020 06:46
Methylene chloride	U		0.0010	0.0020	mg/L	1	19-Jun-2020 06:46
o-Xylene	U		0.00030	0.0010	mg/L	1	19-Jun-2020 06:46
Styrene	U		0.00030	0.0010	mg/L	1	19-Jun-2020 06:46
Tetrachloroethene	U		0.00030	0.0010	mg/L	1	19-Jun-2020 06:46
Toluene	U		0.00020	0.0010	mg/L	1	19-Jun-2020 06:46
trans-1,2-Dichloroethene	U		0.00020	0.0010	mg/L	1	19-Jun-2020 06:46
trans-1,3-Dichloropropene	U		0.00020	0.0010	mg/L	1	19-Jun-2020 06:46
Trichloroethene	U		0.00020	0.0010	mg/L	1	19-Jun-2020 06:46
Vinyl acetate	U		0.00050	0.0010	mg/L	1	19-Jun-2020 06:46

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

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works IDW  
 Sample ID: WG-1620-IDWW01-20200611  
 Collection Date: 11-Jun-2020 12:00

**ANALYTICAL REPORT**  
 WorkOrder:HS20060631  
 Lab ID:HS20060631-01  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MLL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
Vinyl chloride	U		0.00020	0.0010	mg/L	1	19-Jun-2020 06:46
Xylenes, Total	U		0.00030	0.0010	mg/L	1	19-Jun-2020 06:46
1,2-Dichloroethene, Total	U		0.00020	0.0010	mg/L	1	19-Jun-2020 06:46
Surr: 1,2-Dichloroethane-d4	96.2			70-126	%REC	1	19-Jun-2020 06:46
Surr: 4-Bromofluorobenzene	98.0			81-113	%REC	1	19-Jun-2020 06:46
Surr: Dibromofluoromethane	100			77-123	%REC	1	19-Jun-2020 06:46
Surr: Toluene-d8	99.7			82-127	%REC	1	19-Jun-2020 06:46

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

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works IDW  
 Sample ID: WG-1620-IDWW01-20200611  
 Collection Date: 11-Jun-2020 12:00

**ANALYTICAL REPORT**  
 WorkOrder:HS20060631  
 Lab ID:HS20060631-01  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MLL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 16-Jun-2020		Analyst: GEY	
1,2,4-Trichlorobenzene	U		0.00030	0.0020	mg/L	10	23-Jun-2020 13:22
2,4,5-Trichlorophenol	U		0.00057	0.0020	mg/L	10	23-Jun-2020 13:22
2,4,6-Trichlorophenol	U		0.00048	0.0020	mg/L	10	23-Jun-2020 13:22
2,4-Dichlorophenol	U		0.00043	0.0020	mg/L	10	23-Jun-2020 13:22
2,4-Dimethylphenol	U		0.00040	0.0020	mg/L	10	23-Jun-2020 13:22
2,4-Dinitrophenol	U		0.0010	0.010	mg/L	10	23-Jun-2020 13:22
2,4-Dinitrotoluene	U		0.00058	0.0020	mg/L	10	23-Jun-2020 13:22
2,6-Dinitrotoluene	U		0.00042	0.0020	mg/L	10	23-Jun-2020 13:22
2-Chloronaphthalene	U		0.00021	0.0020	mg/L	10	23-Jun-2020 13:22
2-Chlorophenol	U		0.00036	0.0020	mg/L	10	23-Jun-2020 13:22
2-Methylnaphthalene	U		0.00019	0.0010	mg/L	10	23-Jun-2020 13:22
2-Methylphenol	U		0.00045	0.0020	mg/L	10	23-Jun-2020 13:22
2-Nitroaniline	U		0.00041	0.0020	mg/L	10	23-Jun-2020 13:22
2-Nitrophenol	U		0.00034	0.0020	mg/L	10	23-Jun-2020 13:22
3&4-Methylphenol	U		0.00036	0.0020	mg/L	10	23-Jun-2020 13:22
3,3'-Dichlorobenzidine	U		0.00044	0.0020	mg/L	10	23-Jun-2020 13:22
3-Nitroaniline	U		0.00049	0.0020	mg/L	10	23-Jun-2020 13:22
4,6-Dinitro-2-methylphenol	U		0.00020	0.0020	mg/L	10	23-Jun-2020 13:22
4-Bromophenyl phenyl ether	U		0.00051	0.0020	mg/L	10	23-Jun-2020 13:22
4-Chloro-3-methylphenol	U		0.00032	0.0020	mg/L	10	23-Jun-2020 13:22
4-Chloroaniline	U		0.00039	0.0020	mg/L	10	23-Jun-2020 13:22
4-Chlorophenyl phenyl ether	U		0.00044	0.0020	mg/L	10	23-Jun-2020 13:22
4-Nitroaniline	U		0.00035	0.0020	mg/L	10	23-Jun-2020 13:22
4-Nitrophenol	U		0.00047	0.010	mg/L	10	23-Jun-2020 13:22
Acenaphthene	U		0.00027	0.0010	mg/L	10	23-Jun-2020 13:22
Acenaphthylene	U		0.00015	0.0010	mg/L	10	23-Jun-2020 13:22
Anthracene	U		0.00014	0.0010	mg/L	10	23-Jun-2020 13:22
Benz(a)anthracene	U		0.00050	0.0010	mg/L	10	23-Jun-2020 13:22
Benzidine	U		0.0010	0.0020	mg/L	10	23-Jun-2020 13:22
Benzo(a)pyrene	U		0.00020	0.0010	mg/L	10	23-Jun-2020 13:22
Benzo(b)fluoranthene	U		0.00023	0.0010	mg/L	10	23-Jun-2020 13:22
Benzo(g,h,i)perylene	U		0.00014	0.0010	mg/L	10	23-Jun-2020 13:22
Benzo(k)fluoranthene	U		0.00019	0.0010	mg/L	10	23-Jun-2020 13:22
Benzyl alcohol	U		0.00054	0.0020	mg/L	10	23-Jun-2020 13:22
Bis(2-chloroethoxy)methane	U		0.00030	0.0020	mg/L	10	23-Jun-2020 13:22
Bis(2-chloroethyl)ether	U		0.00026	0.0020	mg/L	10	23-Jun-2020 13:22
Bis(2-chloroisopropyl)ether	U		0.00070	0.0020	mg/L	10	23-Jun-2020 13:22
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.0035</b>		<b>0.00037</b>	<b>0.0020</b>	<b>mg/L</b>	10	23-Jun-2020 13:22
Butyl benzyl phthalate	U		0.00019	0.0020	mg/L	10	23-Jun-2020 13:22

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



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works IDW  
 Sample ID: WG-1620-IDWW01-20200611  
 Collection Date: 11-Jun-2020 12:00

**ANALYTICAL REPORT**  
 WorkOrder:HS20060631  
 Lab ID:HS20060631-01  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>			Prep:SW3510 / 16-Jun-2020		Analyst: GEY
Carbazole	U		0.00025	0.0020	mg/L	10	23-Jun-2020 13:22
Chrysene	U		0.00021	0.0010	mg/L	10	23-Jun-2020 13:22
Di-n-butyl phthalate	U		0.00020	0.0020	mg/L	10	23-Jun-2020 13:22
Di-n-octyl phthalate	U		0.00020	0.0020	mg/L	10	23-Jun-2020 13:22
Dibenz(a,h)anthracene	U		0.00024	0.0010	mg/L	10	23-Jun-2020 13:22
Dibenzofuran	U		0.00020	0.0010	mg/L	10	23-Jun-2020 13:22
Diethyl phthalate	U		0.00030	0.0020	mg/L	10	23-Jun-2020 13:22
Dimethyl phthalate	U		0.00041	0.0020	mg/L	10	23-Jun-2020 13:22
Fluoranthene	U		0.00010	0.0010	mg/L	10	23-Jun-2020 13:22
Fluorene	U		0.00030	0.0010	mg/L	10	23-Jun-2020 13:22
Hexachlorobenzene	U		0.00044	0.0020	mg/L	10	23-Jun-2020 13:22
Hexachlorobutadiene	U		0.00030	0.0020	mg/L	10	23-Jun-2020 13:22
Hexachlorocyclopentadiene	U		0.00030	0.0020	mg/L	10	23-Jun-2020 13:22
Hexachloroethane	U		0.00059	0.0020	mg/L	10	23-Jun-2020 13:22
Indeno(1,2,3-cd)pyrene	U		0.00022	0.0010	mg/L	10	23-Jun-2020 13:22
Isophorone	U		0.00025	0.0020	mg/L	10	23-Jun-2020 13:22
N-Nitrosodi-n-propylamine	U		0.00032	0.0020	mg/L	10	23-Jun-2020 13:22
N-Nitrosodimethylamine	U		0.0010	0.0020	mg/L	10	23-Jun-2020 13:22
N-Nitrosodiphenylamine	U		0.00025	0.0020	mg/L	10	23-Jun-2020 13:22
Naphthalene	U		0.00020	0.0010	mg/L	10	23-Jun-2020 13:22
Nitrobenzene	U		0.00024	0.0020	mg/L	10	23-Jun-2020 13:22
Pentachlorophenol	U		0.00079	0.0020	mg/L	10	23-Jun-2020 13:22
Phenanthrene	U		0.00021	0.0010	mg/L	10	23-Jun-2020 13:22
Phenol	U		0.00035	0.0020	mg/L	10	23-Jun-2020 13:22
Pyrene	U		0.00019	0.0010	mg/L	10	23-Jun-2020 13:22
Pyridine	U		0.00030	0.010	mg/L	10	23-Jun-2020 13:22
Surr: 2,4,6-Tribromophenol	105			34-129	%REC	10	23-Jun-2020 13:22
Surr: 2-Fluorobiphenyl	74.9			40-125	%REC	10	23-Jun-2020 13:22
Surr: 2-Fluorophenol	78.9			20-120	%REC	10	23-Jun-2020 13:22
Surr: 4-Terphenyl-d14	78.9			40-135	%REC	10	23-Jun-2020 13:22
Surr: Nitrobenzene-d5	67.7			41-120	%REC	10	23-Jun-2020 13:22
Surr: Phenol-d6	88.7			20-120	%REC	10	23-Jun-2020 13:22
<b>LOW-LEVEL TEXAS TPH BY TX1005</b>		<b>Method:TX1005</b>			Prep:TX1005PR / 16-Jun-2020		Analyst: MBG
nC6 to nC12	U		0.20	0.50	mg/L	1	17-Jun-2020 18:44
>nC12 to nC28	21		0.20	0.50	mg/L	1	17-Jun-2020 18:44
>nC28 to nC35	17		0.20	0.50	mg/L	1	17-Jun-2020 18:44
<b>Total Petroleum Hydrocarbon</b>	<b>38.0</b>		<b>0.20</b>	<b>0.50</b>	<b>mg/L</b>	<b>1</b>	<b>17-Jun-2020 18:44</b>
Surr: 2-Fluorobiphenyl	71.0			70-130	%REC	1	17-Jun-2020 18:44
Surr: Trifluoromethyl benzene	74.1			70-130	%REC	1	17-Jun-2020 18:44

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

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works IDW  
 Sample ID: WG-1620-IDWW01-20200611  
 Collection Date: 11-Jun-2020 12:00

**ANALYTICAL REPORT**  
 WorkOrder:HS20060631  
 Lab ID:HS20060631-01  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MLL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 18-Jun-2020		Analyst: JC	
Arsenic	0.102		0.000800	0.00400	mg/L	2	19-Jun-2020 17:53
Barium	0.384		0.00380	0.00800	mg/L	2	19-Jun-2020 17:53
Cadmium	0.00209	J	0.000400	0.00400	mg/L	2	19-Jun-2020 17:53
Chromium	0.108		0.000800	0.00800	mg/L	2	19-Jun-2020 17:53
Lead	0.200		0.00120	0.00400	mg/L	2	19-Jun-2020 17:53
Selenium	0.00482		0.00220	0.00400	mg/L	2	19-Jun-2020 17:53
Silver	0.00603		0.000400	0.00400	mg/L	2	19-Jun-2020 17:53
<b>MERCURY BY SW7470A</b>		<b>Method:SW7470</b>		Prep:SW7470 / 17-Jun-2020		Analyst: FO	
Mercury	0.0000330	J	0.0000300	0.000200	mg/L	1	17-Jun-2020 16:01
<b>SULFIDE BY SM4500 S2-F</b>		<b>Method:SM4500 S2-F</b>				Analyst: KVL	
Sulfide	200		200	200	mg/L	200	18-Jun-2020 17:50
<b>FLASH POINT BY PENSKY-MARTENS SW1010A</b>		<b>Method:SW1010</b>				Analyst: TH	
Ignitability	> 212		70.0	70.0	°F	1	13-Jun-2020 08:00
<b>CYANIDE - SW9014</b>		<b>Method:SW9014</b>		Prep:SW9010C / 18-Jun-2020		Analyst: KVL	
Cyanide	0.00600		0.00200	0.00500	mg/L	1	18-Jun-2020 14:30
<b>PH BY SW9040C</b>		<b>Method:SW9040C</b>				Analyst: JAC	
pH	8.63	H	0.100	0.100	pH Units	1	19-Jun-2020 12:12
Temp Deg C @pH	23.4	H	0	0	DEG C	1	19-Jun-2020 12:12

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

## Weight / Prep Log

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works IDW  
**WorkOrder:** HS20060631

**Batch ID:** 154500      **Start Date:** 16 Jun 2020 11:33      **End Date:**  
**Method:** TX 1005 PREP      **Prep Code:** TX 1005\_W PR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20060631-01		30.2 (g)	3 (mL)	0.09934

**Batch ID:** 154506      **Start Date:** 16 Jun 2020 09:30      **End Date:** 16 Jun 2020 14:30  
**Method:** SV AQ SEP FUN EXTRACT-LOWLEV - 3510C      **Prep Code:** 3510\_B\_LOW

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20060631-01	1	1000 (mL)	1 (mL)	0.001

**Batch ID:** 154557      **Start Date:** 18 Jun 2020 07:00      **End Date:** 18 Jun 2020 11:00  
**Method:** WATER - SW3010A      **Prep Code:** 3010A

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20060631-01		10 (mL)	10 (mL)	1

**Batch ID:** 154572      **Start Date:** 17 Jun 2020 10:00      **End Date:** 17 Jun 2020 12:00  
**Method:** MERCURY PREP BY 7470A- WATER      **Prep Code:** HG\_WPR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20060631-01		10 (mL)	10 (mL)	1

**Batch ID:** 154628      **Start Date:** 18 Jun 2020 12:00      **End Date:** 18 Jun 2020 14:00  
**Method:** CYANIDE PREP - SW9010C      **Prep Code:** CN\_TW\_PR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20060631-01		50 (mL)	50 (mL)	1

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works IDW  
**WorkOrder:** HS20060631

**DATES REPORT**

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
<b>Batch ID:</b> 154500 ( 0 )		<b>Test Name :</b> LOW-LEVEL TEXAS TPH BY TX1005			<b>Matrix:</b> Water	
HS20060631-01	WG-1620-IDWW01-2020061111	Jun 2020 12:00		16 Jun 2020 11:33	17 Jun 2020 18:44	1
<b>Batch ID:</b> 154506 ( 0 )		<b>Test Name :</b> LOW-LEVEL SEMIVOLATILES BY 8270D			<b>Matrix:</b> Water	
HS20060631-01	WG-1620-IDWW01-2020061111	Jun 2020 12:00		16 Jun 2020 13:10	23 Jun 2020 13:22	10
<b>Batch ID:</b> 154557 ( 0 )		<b>Test Name :</b> ICP-MS METALS BY SW6020A			<b>Matrix:</b> Water	
HS20060631-01	WG-1620-IDWW01-2020061111	Jun 2020 12:00		18 Jun 2020 11:00	19 Jun 2020 17:53	2
<b>Batch ID:</b> 154572 ( 0 )		<b>Test Name :</b> MERCURY BY SW7470A			<b>Matrix:</b> Water	
HS20060631-01	WG-1620-IDWW01-2020061111	Jun 2020 12:00		17 Jun 2020 10:00	17 Jun 2020 16:01	1
<b>Batch ID:</b> 154628 ( 0 )		<b>Test Name :</b> CYANIDE - SW9014			<b>Matrix:</b> Water	
HS20060631-01	WG-1620-IDWW01-2020061111	Jun 2020 12:00		18 Jun 2020 12:00	18 Jun 2020 14:30	1
<b>Batch ID:</b> R363190 ( 0 )		<b>Test Name :</b> FLASH POINT BY PENSKY-MARTENS SW1010A			<b>Matrix:</b> Water	
HS20060631-01	WG-1620-IDWW01-2020061111	Jun 2020 12:00			13 Jun 2020 08:00	1
<b>Batch ID:</b> R363574 ( 0 )		<b>Test Name :</b> LOW LEVEL VOLATILES BY SW8260C			<b>Matrix:</b> Water	
HS20060631-01	WG-1620-IDWW01-2020061111	Jun 2020 12:00			19 Jun 2020 06:46	1
<b>Batch ID:</b> R363578 ( 0 )		<b>Test Name :</b> SULFIDE BY SM4500 S2-F			<b>Matrix:</b> Water	
HS20060631-01	WG-1620-IDWW01-2020061111	Jun 2020 12:00			18 Jun 2020 17:50	200
<b>Batch ID:</b> R363579 ( 0 )		<b>Test Name :</b> PH BY SW9040C			<b>Matrix:</b> Water	
HS20060631-01	WG-1620-IDWW01-2020061111	Jun 2020 12:00			19 Jun 2020 12:12	1

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works IDW  
**WorkOrder:** HS20060631

**QC BATCH REPORT**

**Batch ID:** 154500 ( 0 )      **Instrument:** FID-11      **Method:** LOW-LEVEL TEXAS TPH BY TX1005

<b>MBLK</b>		Sample ID: <b>MBLK-154500</b>		Units: <b>mg/L</b>		Analysis Date: <b>17-Jun-2020 16:18</b>				
Client ID:		Run ID: <b>FID-11_363506</b>		SeqNo: <b>5625009</b>		PrepDate: <b>16-Jun-2020</b>		DF: <b>1</b>		
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	U	0.50								
>nC12 to nC28	U	0.50								
>nC28 to nC35	U	0.50								
Total Petroleum Hydrocarbon	U	0.50								
Surr: 2-Fluorobiphenyl	2.358	0	2.5	0	94.3	70 - 130				
Surr: Trifluoromethyl benzene	2.656	0	2.5	0	106	70 - 130				

<b>LCS</b>		Sample ID: <b>LCS-154500</b>		Units: <b>mg/L</b>		Analysis Date: <b>17-Jun-2020 16:48</b>				
Client ID:		Run ID: <b>FID-11_363506</b>		SeqNo: <b>5625010</b>		PrepDate: <b>16-Jun-2020</b>		DF: <b>1</b>		
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	26.69	0.50	25	0	107	75 - 125				
>nC12 to nC28	28.37	0.50	25	0	113	75 - 125				
Surr: 2-Fluorobiphenyl	2.985	0	2.5	0	119	70 - 130				
Surr: Trifluoromethyl benzene	2.687	0	2.5	0	107	70 - 130				

<b>LCSD</b>		Sample ID: <b>LCSD-154500</b>		Units: <b>mg/L</b>		Analysis Date: <b>17-Jun-2020 17:17</b>				
Client ID:		Run ID: <b>FID-11_363506</b>		SeqNo: <b>5625011</b>		PrepDate: <b>16-Jun-2020</b>		DF: <b>1</b>		
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	27.84	0.50	25	0	111	75 - 125	26.69	4.21	20	
>nC12 to nC28	28.68	0.50	25	0	115	75 - 125	28.37	1.09	20	
Surr: 2-Fluorobiphenyl	3.001	0	2.5	0	120	70 - 130	2.985	0.503	20	
Surr: Trifluoromethyl benzene	2.863	0	2.5	0	115	70 - 130	2.687	6.36	20	

<b>MS</b>		Sample ID: <b>HS20060600-01MS</b>		Units: <b>mg/L</b>		Analysis Date: <b>17-Jun-2020 18:15</b>				
Client ID:		Run ID: <b>FID-11_363506</b>		SeqNo: <b>5625013</b>		PrepDate: <b>16-Jun-2020</b>		DF: <b>1</b>		
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	26.3	0.50	24.81	0	106	75 - 125				
>nC12 to nC28	25.33	0.50	24.81	0	102	75 - 125				
Surr: 2-Fluorobiphenyl	2.633	0	2.481	0	106	70 - 130				
Surr: Trifluoromethyl benzene	2.502	0	2.481	0	101	70 - 130				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works IDW  
**WorkOrder:** HS20060631

**QC BATCH REPORT**

<b>Batch ID:</b> 154500 ( 0 )		<b>Instrument:</b> FID-11		<b>Method:</b> LOW-LEVEL TEXAS TPH BY TX1005					
<b>MSD</b>	Sample ID: <b>HS20060600-01MSD</b>	Units: <b>mg/L</b>			Analysis Date: <b>17-Jun-2020 18:44</b>				
Client ID:	Run ID: <b>FID-11_363506</b>	SeqNo: <b>5625014</b>		PrepDate: <b>16-Jun-2020</b>		DF: <b>1</b>			
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

nC6 to nC12	27.75	0.50	25.1	0	111	75 - 125	26.3	5.39	20
>nC12 to nC28	27.95	0.50	25.1	0	111	75 - 125	25.33	9.83	20
Surr: 2-Fluorobiphenyl	2.968	0	2.51	0	118	70 - 130	2.633	12	20
Surr: Trifluoromethyl benzene	2.662	0	2.51	0	106	70 - 130	2.502	6.19	20

The following samples were analyzed in this batch: HS20060631-01

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works IDW  
**WorkOrder:** HS20060631

**QC BATCH REPORT**

<b>Batch ID:</b> 154557 ( 0 )	<b>Instrument:</b> ICPMS05	<b>Method:</b> ICP-MS METALS BY SW6020A
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<b>MBLK</b>	Sample ID: <b>MBLK-154557</b>	Units: <b>mg/L</b>	Analysis Date: <b>22-Jun-2020 13:02</b>							
Client ID:	Run ID: <b>ICPMS05_363671</b>	SeqNo: <b>5629905</b>	PrepDate: <b>18-Jun-2020</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Arsenic	U	0.00200								
Barium	U	0.00400								
Cadmium	U	0.00200								
Chromium	U	0.00400								
Lead	U	0.00200								
Selenium	U	0.00200								
Silver	U	0.00200								

<b>LCS</b>	Sample ID: <b>LCS-154557</b>	Units: <b>mg/L</b>	Analysis Date: <b>22-Jun-2020 13:05</b>							
Client ID:	Run ID: <b>ICPMS05_363671</b>	SeqNo: <b>5629906</b>	PrepDate: <b>18-Jun-2020</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Arsenic	0.05154	0.00200	0.05	0	103	80 - 120				
Barium	0.04936	0.00400	0.05	0	98.7	80 - 120				
Cadmium	0.05087	0.00200	0.05	0	102	80 - 120				
Chromium	0.05028	0.00400	0.05	0	101	80 - 120				
Lead	0.04881	0.00200	0.05	0	97.6	80 - 120				
Selenium	0.05039	0.00200	0.05	0	101	80 - 120				
Silver	0.04999	0.00200	0.05	0	100.0	80 - 120				

<b>MS</b>	Sample ID: <b>HS20060577-01MS</b>	Units: <b>mg/L</b>	Analysis Date: <b>19-Jun-2020 16:02</b>							
Client ID:	Run ID: <b>ICPMS04_363616</b>	SeqNo: <b>5627694</b>	PrepDate: <b>18-Jun-2020</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Arsenic	0.04826	0.00200	0.05	0.000678	95.2	80 - 120				
Cadmium	0.049	0.00200	0.05	0.00003	97.9	80 - 120				
Chromium	0.04563	0.00400	0.05	0.000276	90.7	80 - 120				
Lead	0.04707	0.00200	0.05	0.000092	94.0	80 - 120				
Selenium	0.04715	0.00200	0.05	0.000452	93.4	80 - 120				
Silver	0.04915	0.00200	0.05	0.000027	98.2	80 - 120				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works IDW  
**WorkOrder:** HS20060631

**QC BATCH REPORT**

<b>Batch ID:</b> 154557 ( 0 )	<b>Instrument:</b> ICPMS05	<b>Method:</b> ICP-MS METALS BY SW6020A								
<b>MS</b>	Sample ID: <b>HS20060577-01MS</b>	Units: <b>mg/L</b>	Analysis Date: <b>22-Jun-2020 13:12</b>							
Client ID:	Run ID: <b>ICPMS05_363671</b>	SeqNo: <b>5629909</b>	PrepDate: <b>18-Jun-2020</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Barium	0.4767	0.00400	0.05	0.4067	140	80 - 120				SO
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<b>MSD</b>	Sample ID: <b>HS20060577-01MSD</b>	Units: <b>mg/L</b>	Analysis Date: <b>19-Jun-2020 16:04</b>							
Client ID:	Run ID: <b>ICPMS04_363616</b>	SeqNo: <b>5627695</b>	PrepDate: <b>18-Jun-2020</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Arsenic	0.04757	0.00200	0.05	0.000678	93.8	80 - 120	0.04826	1.44	20
Cadmium	0.04587	0.00200	0.05	0.00003	91.7	80 - 120	0.049	6.6	20
Chromium	0.04454	0.00400	0.05	0.000276	88.5	80 - 120	0.04563	2.41	20
Lead	0.04324	0.00200	0.05	0.000092	86.3	80 - 120	0.04707	8.48	20
Selenium	0.04584	0.00200	0.05	0.000452	90.8	80 - 120	0.04715	2.83	20
Silver	0.04608	0.00200	0.05	0.000027	92.1	80 - 120	0.04915	6.46	20

<b>MSD</b>	Sample ID: <b>HS20060577-01MSD</b>	Units: <b>mg/L</b>	Analysis Date: <b>22-Jun-2020 13:14</b>							
Client ID:	Run ID: <b>ICPMS05_363671</b>	SeqNo: <b>5629910</b>	PrepDate: <b>18-Jun-2020</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Barium	0.4602	0.00400	0.05	0.4067	107	80 - 120	0.4767	3.53	20	O
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<b>PDS</b>	Sample ID: <b>HS20060577-01PDS</b>	Units: <b>mg/L</b>	Analysis Date: <b>19-Jun-2020 16:06</b>							
Client ID:	Run ID: <b>ICPMS04_363616</b>	SeqNo: <b>5627696</b>	PrepDate: <b>18-Jun-2020</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Arsenic	0.09312	0.00200	0.1	0.000678	92.4	75 - 125			
Cadmium	0.0893	0.00200	0.1	0.00003	89.3	75 - 125			
Chromium	0.08854	0.00400	0.1	0.000276	88.3	75 - 125			
Lead	0.08827	0.00200	0.1	0.000092	88.2	75 - 125			
Selenium	0.09533	0.00200	0.1	0.000452	94.9	75 - 125			
Silver	0.0918	0.00200	0.1	0.000027	91.8	75 - 125			



**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works IDW  
**WorkOrder:** HS20060631

**QC BATCH REPORT**

<b>Batch ID:</b> 154557 ( 0 )		<b>Instrument:</b> ICPMS05		<b>Method:</b> ICP-MS METALS BY SW6020A					
<b>PDS</b>	Sample ID: <b>HS20060577-01PDS</b>	Units: <b>mg/L</b>			Analysis Date: <b>22-Jun-2020 13:17</b>				
Client ID:	Run ID: <b>ICPMS05_363671</b>	SeqNo: <b>5629911</b>		PrepDate: <b>18-Jun-2020</b>		DF: <b>1</b>			
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

Barium	0.5088	0.00400	0.1	0.4067	102	75 - 125			O
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<b>SD</b>	Sample ID: <b>HS20060577-01SD</b>	Units: <b>mg/L</b>			Analysis Date: <b>19-Jun-2020 16:00</b>				
Client ID:	Run ID: <b>ICPMS04_363616</b>	SeqNo: <b>5627693</b>		PrepDate: <b>18-Jun-2020</b>		DF: <b>5</b>			
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit Qual

Arsenic	U	0.0100					0.000678	0	10
Cadmium	U	0.0100					0.00003	0	10
Chromium	U	0.0200					0.000276	0	10
Lead	U	0.0100					0.000092	0	10
Selenium	U	0.0100					0.000452	0	10
Silver	U	0.0100					0.000027	0	10

<b>SD</b>	Sample ID: <b>HS20060577-01SD</b>	Units: <b>mg/L</b>			Analysis Date: <b>22-Jun-2020 13:09</b>				
Client ID:	Run ID: <b>ICPMS05_363671</b>	SeqNo: <b>5629908</b>		PrepDate: <b>18-Jun-2020</b>		DF: <b>5</b>			
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit Qual

Barium	0.4169	0.0200					0.4067	2.51	10
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The following samples were analyzed in this batch: HS20060631-01

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works IDW  
**WorkOrder:** HS20060631

**QC BATCH REPORT**

<b>Batch ID:</b> 154572 ( 0 )	<b>Instrument:</b> HG03	<b>Method:</b> MERCURY BY SW7470A
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<b>MBLK</b>	Sample ID: <b>MBLK-154572</b>	Units: <b>mg/L</b>	Analysis Date: <b>17-Jun-2020 15:32</b>							
Client ID:	Run ID: <b>HG03_363439</b>	SeqNo: <b>5623672</b>	PrepDate: <b>17-Jun-2020</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual

Mercury U 0.000200

<b>LCS</b>	Sample ID: <b>LCS-154572</b>	Units: <b>mg/L</b>	Analysis Date: <b>17-Jun-2020 15:34</b>							
Client ID:	Run ID: <b>HG03_363439</b>	SeqNo: <b>5623673</b>	PrepDate: <b>17-Jun-2020</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual

Mercury 0.00503 0.000200 0.005 0 101 80 - 120

<b>MS</b>	Sample ID: <b>HS20060574-05MS</b>	Units: <b>mg/L</b>	Analysis Date: <b>17-Jun-2020 15:38</b>							
Client ID:	Run ID: <b>HG03_363439</b>	SeqNo: <b>5623675</b>	PrepDate: <b>17-Jun-2020</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual

Mercury 0.00505 0.000200 0.005 0.000021 101 75 - 125

<b>MSD</b>	Sample ID: <b>HS20060574-05MSD</b>	Units: <b>mg/L</b>	Analysis Date: <b>17-Jun-2020 15:40</b>							
Client ID:	Run ID: <b>HG03_363439</b>	SeqNo: <b>5623676</b>	PrepDate: <b>17-Jun-2020</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual

Mercury 0.00504 0.000200 0.005 0.000021 100 75 - 125 0.00505 0.198 20

The following samples were analyzed in this batch: HS20060631-01

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works IDW  
**WorkOrder:** HS20060631

**QC BATCH REPORT**

Batch ID: 154506 ( 0 )		Instrument: SV-7		Method: LOW-LEVEL SEMIVOLATILES BY 8270D						
MBLK	Sample ID: MBLK-154506	Units: ug/L			Analysis Date: 23-Jun-2020 11:48					
Client ID:	Run ID: SV-7_363754	SeqNo: 5631543		PrepDate: 16-Jun-2020		DF: 1				
Analyte	Result	MLQ	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 IDW  
**WorkOrder:** HS20060631

**QC BATCH REPORT**

Batch ID: 154506 ( 0 )		Instrument: SV-7		Method: LOW-LEVEL SEMIVOLATILES BY 8270D						
MBLK	Sample ID: MBLK-154506	Units: ug/L			Analysis Date: 23-Jun-2020 11:48					
Client ID:	Run ID: SV-7_363754	SeqNo: 5631543		PrepDate: 16-Jun-2020		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	4.746	0.20	5	0	94.9	34 - 129				
Surr: 2-Fluorobiphenyl	3.995	0.20	5	0	79.9	40 - 125				
Surr: 2-Fluorophenol	4.568	0.20	5	0	91.4	20 - 120				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works IDW  
**WorkOrder:** HS20060631

**QC BATCH REPORT**

**Batch ID:** 154506 ( 0 )      **Instrument:** SV-7      **Method:** LOW-LEVEL SEMIVOLATILES BY 8270D

**MBLK**      Sample ID: **MBLK-154506**      Units: **ug/L**      Analysis Date: **23-Jun-2020 11:48**  
Client ID:      Run ID: **SV-7\_363754**      SeqNo: **5631543**      PrepDate: **16-Jun-2020**      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>	4.126	0.20	5	0	82.5	40 - 135				
<i>Surr: Nitrobenzene-d5</i>	3.785	0.20	5	0	75.7	41 - 120				
<i>Surr: Phenol-d6</i>	5.01	0.20	5	0	100	20 - 120				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works IDW  
**WorkOrder:** HS20060631

**QC BATCH REPORT**

Batch ID: 154506 ( 0 )		Instrument: SV-7			Method: LOW-LEVEL SEMIVOLATILES BY 8270D					
LCS	Sample ID: LCS-154506	Units: ug/L			Analysis Date: 23-Jun-2020 12:07					
Client ID:	Run ID: SV-7_363754	SeqNo: 5631544		PrepDate: 16-Jun-2020		DF: 1				
Analyte	Result	MLQ	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trichlorobenzene	4.189	0.20	5	0	83.8	45 - 120				
2,4,5-Trichlorophenol	4.322	0.20	5	0	86.4	46 - 120				
2,4,6-Trichlorophenol	4.365	0.20	5	0	87.3	42 - 120				
2,4-Dichlorophenol	4.297	0.20	5	0	85.9	49 - 120				
2,4-Dimethylphenol	3.981	0.20	5	0	79.6	35 - 120				
2,4-Dinitrophenol	4.126	1.0	5	0	82.5	15 - 120				
2,4-Dinitrotoluene	4.324	0.20	5	0	86.5	50 - 122				
2,6-Dinitrotoluene	4.468	0.20	5	0	89.4	50 - 120				
2-Chloronaphthalene	4.656	0.20	5	0	93.1	50 - 120				
2-Chlorophenol	4.659	0.20	5	0	93.2	40 - 120				
2-Methylnaphthalene	4.268	0.10	5	0	85.4	50 - 120				
2-Methylphenol	4.66	0.20	5	0	93.2	45 - 120				
2-Nitroaniline	4.261	0.20	5	0	85.2	28 - 139				
2-Nitrophenol	5.553	0.20	5	0	111	40 - 120				
3&4-Methylphenol	4.309	0.20	5	0	86.2	35 - 120				
3,3'-Dichlorobenzidine	3.138	0.20	5	0	62.8	15 - 120				
3-Nitroaniline	1.503	0.20	5	0	30.1	30 - 120				
4,6-Dinitro-2-methylphenol	4.54	0.20	5	0	90.8	25 - 121				
4-Bromophenyl phenyl ether	4.375	0.20	5	0	87.5	45 - 120				
4-Chloro-3-methylphenol	4.352	0.20	5	0	87.0	47 - 120				
4-Chloroaniline	2.475	0.20	5	0	49.5	20 - 120				
4-Chlorophenyl phenyl ether	4.275	0.20	5	0	85.5	50 - 120				
4-Nitroaniline	2.549	0.20	5	0	51.0	30 - 133				
4-Nitrophenol	4.351	1.0	5	0	87.0	30 - 130				
Acenaphthene	4.084	0.10	5	0	81.7	45 - 120				
Acenaphthylene	4.389	0.10	5	0	87.8	47 - 120				
Anthracene	4.416	0.10	5	0	88.3	45 - 120				
Benz(a)anthracene	5.259	0.10	5	0	105	40 - 120				
Benzidine	0.615	0.20	5	0	12.3	10 - 120				
Benzo(a)pyrene	5.369	0.10	5	0	107	45 - 120				
Benzo(b)fluoranthene	5.753	0.10	5	0	115	50 - 120				
Benzo(g,h,i)perylene	5.672	0.10	5	0	113	42 - 127				
Benzo(k)fluoranthene	5.448	0.10	5	0	109	45 - 127				
Benzyl alcohol	4.437	0.20	5	0	88.7	35 - 122				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works IDW  
**WorkOrder:** HS20060631

**QC BATCH REPORT**

Batch ID: 154506 ( 0 )		Instrument: SV-7		Method: LOW-LEVEL SEMIVOLATILES BY 8270D						
LCS	Sample ID: LCS-154506	Units: ug/L			Analysis Date: 23-Jun-2020 12:07					
Client ID:	Run ID: SV-7_363754	SeqNo: 5631544		PrepDate: 16-Jun-2020		DF: 1				
Analyte	Result	MLQ	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bis(2-chloroethoxy)methane	4.261	0.20	5	0	85.2	45 - 120				
Bis(2-chloroethyl)ether	4.831	0.20	5	0	96.6	37 - 121				
Bis(2-chloroisopropyl)ether	4.331	0.20	5	0	86.6	40 - 120				
Bis(2-ethylhexyl)phthalate	5.016	0.20	5	0	100	40 - 139				
Butyl benzyl phthalate	4.555	0.20	5	0	91.1	47 - 123				
Carbazole	4.35	0.20	5	0	87.0	42 - 128				
Chrysene	4.16	0.10	5	0	83.2	43 - 120				
Dibenz(a,h)anthracene	5.986	0.10	5	0	120	45 - 125				
Dibenzofuran	4.286	0.10	5	0	85.7	50 - 120				
Diethyl phthalate	4.072	0.20	5	0	81.4	41 - 120				
Dimethyl phthalate	4.098	0.20	5	0	82.0	40 - 122				
Di-n-butyl phthalate	4.628	0.20	5	0	92.6	45 - 123				
Di-n-octyl phthalate	5.167	0.20	5	0	103	45 - 129				
Fluoranthene	4.674	0.10	5	0	93.5	45 - 125				
Fluorene	4.37	0.10	5	0	87.4	49 - 120				
Hexachlorobenzene	4.465	0.20	5	0	89.3	48 - 120				
Hexachlorobutadiene	4.061	0.20	5	0	81.2	40 - 120				
Hexachlorocyclopentadiene	3.053	0.20	5	0	61.1	34 - 136				
Hexachloroethane	3.906	0.20	5	0	78.1	40 - 120				
Indeno(1,2,3-cd)pyrene	6.094	0.10	5	0	122	41 - 128				
Isophorone	4.32	0.20	5	0	86.4	40 - 121				
Naphthalene	4.217	0.10	5	0	84.3	45 - 120				
Nitrobenzene	4.402	0.20	5	0	88.0	44 - 120				
N-Nitrosodimethylamine	5.673	0.20	5	0	113	30 - 121				
N-Nitrosodi-n-propylamine	4.056	0.20	5	0	81.1	40 - 120				
N-Nitrosodiphenylamine	4.272	0.20	5	0	85.4	40 - 125				
Pentachlorophenol	2.675	0.20	5	0	53.5	19 - 121				
Phenanthrene	4.403	0.10	5	0	88.1	45 - 121				
Phenol	4.774	0.20	5	0	95.5	20 - 124				
Pyrene	4.432	0.10	5	0	88.6	40 - 130				
Pyridine	5.672	1.0	5	0	113	15 - 120				
Surr: 2,4,6-Tribromophenol	4.7	0.20	5	0	94.0	34 - 129				
Surr: 2-Fluorobiphenyl	4.018	0.20	5	0	80.4	40 - 125				
Surr: 2-Fluorophenol	5.036	0.20	5	0	101	20 - 120				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works IDW  
**WorkOrder:** HS20060631

**QC BATCH REPORT**

**Batch ID:** 154506 ( 0 )      **Instrument:** SV-7      **Method:** LOW-LEVEL SEMIVOLATILES BY 8270D

**LCS**      Sample ID: **LCS-154506**      Units: **ug/L**      Analysis Date: **23-Jun-2020 12:07**  
Client ID:      Run ID: **SV-7\_363754**      SeqNo: **5631544**      PrepDate: **16-Jun-2020**      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>	4.225	0.20	5	0	84.5	40 - 135				
<i>Surr: Nitrobenzene-d5</i>	3.978	0.20	5	0	79.6	41 - 120				
<i>Surr: Phenol-d6</i>	5.27	0.20	5	0	105	20 - 120				



**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works IDW  
**WorkOrder:** HS20060631

**QC BATCH REPORT**

Batch ID: 154506 ( 0 )		Instrument: SV-7		Method: LOW-LEVEL SEMIVOLATILES BY 8270D						
MS	Sample ID: HS20060638-01MS	Units: ug/L			Analysis Date: 23-Jun-2020 15:34					
Client ID:	Run ID: SV-7_363754	SeqNo: 5631987	PrepDate: 16-Jun-2020	DF: 1						
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trichlorobenzene	2.978	0.20	5	0	59.6	45 - 120				
2,4,5-Trichlorophenol	4.339	0.20	5	0	86.8	46 - 120				
2,4,6-Trichlorophenol	3.58	0.20	5	0	71.6	42 - 120				
2,4-Dichlorophenol	3.198	0.20	5	0	64.0	49 - 120				
2,4-Dimethylphenol	2.717	0.20	5	0	54.3	35 - 120				
2,4-Dinitrophenol	3.665	1.0	5	0	73.3	15 - 120				
2,4-Dinitrotoluene	4.558	0.20	5	0	91.2	50 - 122				
2,6-Dinitrotoluene	3.904	0.20	5	0	78.1	50 - 120				
2-Chloronaphthalene	3.584	0.20	5	0	71.7	50 - 120				
2-Chlorophenol	3.185	0.20	5	0	63.7	40 - 120				
2-Methylnaphthalene	3.048	0.10	5	0	61.0	50 - 120				
2-Methylphenol	3.225	0.20	5	0	64.5	45 - 120				
2-Nitroaniline	4.647	0.20	5	0	92.9	28 - 139				
2-Nitrophenol	3.392	0.20	5	0	67.8	40 - 120				
3&4-Methylphenol	3.172	0.20	5	0	63.4	35 - 120				
3,3'-Dichlorobenzidine	0.2545	0.20	5	0	5.09	15 - 120				S
3-Nitroaniline	3.081	0.20	5	0	61.6	30 - 120				
4,6-Dinitro-2-methylphenol	4.426	0.20	5	0	88.5	25 - 121				
4-Bromophenyl phenyl ether	3.96	0.20	5	0	79.2	45 - 120				
4-Chloro-3-methylphenol	3.771	0.20	5	0	75.4	47 - 120				
4-Chloroaniline	1.396	0.20	5	0	27.9	20 - 120				
4-Chlorophenyl phenyl ether	3.482	0.20	5	0	69.6	50 - 120				
4-Nitroaniline	4.327	0.20	5	0	86.5	30 - 133				
4-Nitrophenol	3.085	1.0	5	0	61.7	30 - 130				
Acenaphthene	3.2	0.10	5	0	64.0	45 - 120				
Acenaphthylene	1.593	0.10	5	0	31.9	47 - 120				S
Anthracene	4.309	0.10	5	0	86.2	45 - 120				
Benz(a)anthracene	5.718	0.10	5	0	114	40 - 120				
Benzidine	U	0.20	5	0	0	10 - 120				S
Benzo(a)pyrene	5.478	0.10	5	0	110	45 - 120				
Benzo(b)fluoranthene	5.732	0.10	5	0	115	50 - 120				
Benzo(g,h,i)perylene	5.558	0.10	5	0	111	42 - 127				
Benzo(k)fluoranthene	5.46	0.10	5	0	109	45 - 127				
Benzyl alcohol	3.157	0.20	5	0	63.1	35 - 122				

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**Project:** Houston TX-Wood Preserving Works IDW  
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**QC BATCH REPORT**

Batch ID: 154506 ( 0 )		Instrument: SV-7		Method: LOW-LEVEL SEMIVOLATILES BY 8270D						
MS	Sample ID: HS20060638-01MS	Units: ug/L			Analysis Date: 23-Jun-2020 15:34					
Client ID:	Run ID: SV-7_363754	SeqNo: 5631987	PrepDate: 16-Jun-2020	DF: 1						
Analyte	Result	MLQ	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bis(2-chloroethoxy)methane	2.954	0.20	5	0	59.1	45 - 120				
Bis(2-chloroethyl)ether	3.009	0.20	5	0	60.2	37 - 121				
Bis(2-chloroisopropyl)ether	3.037	0.20	5	0	60.7	40 - 120				
Bis(2-ethylhexyl)phthalate	5.681	0.20	5	0	114	40 - 139				
Butyl benzyl phthalate	5.266	0.20	5	0	105	47 - 123				
Carbazole	5.612	0.20	5	0	112	42 - 128				
Chrysene	4.925	0.10	5	0	98.5	43 - 120				
Dibenz(a,h)anthracene	5.721	0.10	5	0	114	45 - 125				
Dibenzofuran	3.548	0.10	5	0	71.0	50 - 120				
Diethyl phthalate	4.408	0.20	5	0	88.2	41 - 120				
Dimethyl phthalate	4.056	0.20	5	0	81.1	40 - 122				
Di-n-butyl phthalate	5.063	0.20	5	0.09641	99.3	45 - 123				
Di-n-octyl phthalate	5.768	0.20	5	0	115	45 - 129				
Fluoranthene	5.072	0.10	5	0	101	45 - 125				
Fluorene	3.747	0.10	5	0	74.9	49 - 120				
Hexachlorobenzene	3.99	0.20	5	0	79.8	48 - 120				
Hexachlorobutadiene	2.846	0.20	5	0	56.9	40 - 120				
Hexachlorocyclopentadiene	1.964	0.20	5	0	39.3	34 - 136				
Hexachloroethane	2.787	0.20	5	0	55.7	40 - 120				
Indeno(1,2,3-cd)pyrene	5.464	0.10	5	0	109	41 - 128				
Isophorone	3.031	0.20	5	0	60.6	40 - 121				
Naphthalene	3	0.10	5	0	60.0	45 - 120				
Nitrobenzene	3.122	0.20	5	0	62.4	44 - 120				
N-Nitrosodimethylamine	4.003	0.20	5	0	80.1	30 - 121				
N-Nitrosodi-n-propylamine	2.858	0.20	5	0	57.2	40 - 120				
N-Nitrosodiphenylamine	4.457	0.20	5	0	89.1	40 - 125				
Pentachlorophenol	3.935	0.20	5	0	78.7	19 - 121				
Phenanthrene	4.524	0.10	5	0	90.5	45 - 121				
Phenol	3.412	0.20	5	0	68.2	20 - 124				
Pyrene	5.058	0.10	5	0	101	40 - 130				
Pyridine	3.374	1.0	5	0	67.5	15 - 120				
Surr: 2,4,6-Tribromophenol	5.267	0.20	5	0	105	34 - 129				
Surr: 2-Fluorobiphenyl	3.021	0.20	5	0	60.4	40 - 125				
Surr: 2-Fluorophenol	3.409	0.20	5	0	68.2	20 - 120				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works IDW  
**WorkOrder:** HS20060631

**QC BATCH REPORT**

Batch ID: 154506 ( 0 )		Instrument: SV-7		Method: LOW-LEVEL SEMIVOLATILES BY 8270D						
<b>MS</b>	Sample ID: <b>HS20060638-01MS</b>	Units: <b>ug/L</b>			Analysis Date: <b>23-Jun-2020 15:34</b>					
Client ID:	Run ID: <b>SV-7_363754</b>	SeqNo: <b>5631987</b>		PrepDate: <b>16-Jun-2020</b>		DF: <b>1</b>				
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>	4.751	0.20	5	0	95.0	40 - 135				
<i>Surr: Nitrobenzene-d5</i>	2.84	0.20	5	0	56.8	41 - 120				
<i>Surr: Phenol-d6</i>	3.826	0.20	5	0	76.5	20 - 120				

**Client:** Golder Associates Inc.  
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**WorkOrder:** HS20060631

**QC BATCH REPORT**

Batch ID: 154506 ( 0 )		Instrument: SV-7		Method: LOW-LEVEL SEMIVOLATILES BY 8270D						
MSD	Sample ID: HS20060638-01MSD	Units: ug/L			Analysis Date: 23-Jun-2020 15:53					
Client ID:	Run ID: SV-7_363754	SeqNo: 5631988	PrepDate: 16-Jun-2020	DF: 1						
Analyte	Result	MLQ	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trichlorobenzene	2.965	0.20	5	0	59.3	45 - 120	2.978	0.427	20	
2,4,5-Trichlorophenol	4.152	0.20	5	0	83.0	46 - 120	4.339	4.4	20	
2,4,6-Trichlorophenol	3.479	0.20	5	0	69.6	42 - 120	3.58	2.88	20	
2,4-Dichlorophenol	3.134	0.20	5	0	62.7	49 - 120	3.198	2	20	
2,4-Dimethylphenol	3.01	0.20	5	0	60.2	35 - 120	2.717	10.2	20	
2,4-Dinitrophenol	3.907	1.0	5	0	78.1	15 - 120	3.665	6.4	50	
2,4-Dinitrotoluene	4.707	0.20	5	0	94.1	50 - 122	4.558	3.21	20	
2,6-Dinitrotoluene	4.171	0.20	5	0	83.4	50 - 120	3.904	6.62	20	
2-Chloronaphthalene	3.617	0.20	5	0	72.3	50 - 120	3.584	0.906	20	
2-Chlorophenol	3.415	0.20	5	0	68.3	40 - 120	3.185	6.97	20	
2-Methylnaphthalene	3.079	0.10	5	0	61.6	50 - 120	3.048	1.01	20	
2-Methylphenol	3.126	0.20	5	0	62.5	45 - 120	3.225	3.1	20	
2-Nitroaniline	4.51	0.20	5	0	90.2	28 - 139	4.647	3	20	
2-Nitrophenol	3.213	0.20	5	0	64.3	40 - 120	3.392	5.44	20	
3&4-Methylphenol	3.274	0.20	5	0	65.5	35 - 120	3.172	3.14	20	
3,3'-Dichlorobenzidine	0.2568	0.20	5	0	5.14	15 - 120	0.2545	0.897	20	S
3-Nitroaniline	4.362	0.20	5	0	87.2	30 - 120	3.081	34.4	20	R
4,6-Dinitro-2-methylphenol	4.835	0.20	5	0	96.7	25 - 121	4.426	8.84	30	
4-Bromophenyl phenyl ether	4.015	0.20	5	0	80.3	45 - 120	3.96	1.4	20	
4-Chloro-3-methylphenol	3.568	0.20	5	0	71.4	47 - 120	3.771	5.53	20	
4-Chloroaniline	2.641	0.20	5	0	52.8	20 - 120	1.396	61.6	20	R
4-Chlorophenyl phenyl ether	3.607	0.20	5	0	72.1	50 - 120	3.482	3.53	20	
4-Nitroaniline	4.573	0.20	5	0	91.5	30 - 133	4.327	5.53	20	
4-Nitrophenol	3.177	1.0	5	0	63.5	30 - 130	3.085	2.95	20	
Acenaphthene	3.206	0.10	5	0	64.1	45 - 120	3.2	0.183	20	
Acenaphthylene	1.778	0.10	5	0	35.6	47 - 120	1.593	11	20	S
Anthracene	4.453	0.10	5	0	89.1	45 - 120	4.309	3.28	20	
Benz(a)anthracene	5.554	0.10	5	0	111	40 - 120	5.718	2.91	20	
Benzdine	U	0.20	5	0	0	10 - 120	0	0	30	S
Benzo(a)pyrene	5.736	0.10	5	0	115	45 - 120	5.478	4.6	20	
Benzo(b)fluoranthene	5.519	0.10	5	0	110	50 - 120	5.732	3.8	20	
Benzo(g,h,i)perylene	5.535	0.10	5	0	111	42 - 127	5.558	0.421	20	
Benzo(k)fluoranthene	5.564	0.10	5	0	111	45 - 127	5.46	1.88	20	
Benzyl alcohol	3.195	0.20	5	0	63.9	35 - 122	3.157	1.18	20	

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works IDW  
**WorkOrder:** HS20060631

**QC BATCH REPORT**

Batch ID: 154506 ( 0 )		Instrument: SV-7		Method: LOW-LEVEL SEMIVOLATILES BY 8270D						
MSD	Sample ID: HS20060638-01MSD	Units: ug/L			Analysis Date: 23-Jun-2020 15:53					
Client ID:	Run ID: SV-7_363754	SeqNo: 5631988	PrepDate: 16-Jun-2020	DF: 1						
Analyte	Result	MLQ	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bis(2-chloroethoxy)methane	3.097	0.20	5	0	61.9	45 - 120	2.954	4.73	20	
Bis(2-chloroethyl)ether	3.698	0.20	5	0	74.0	37 - 121	3.009	20.6	20	R
Bis(2-chloroisopropyl)ether	3.124	0.20	5	0	62.5	40 - 120	3.037	2.8	20	
Bis(2-ethylhexyl)phthalate	5.927	0.20	5	0	119	40 - 139	5.681	4.24	20	
Butyl benzyl phthalate	5.349	0.20	5	0	107	47 - 123	5.266	1.55	20	
Carbazole	5.82	0.20	5	0	116	42 - 128	5.612	3.63	20	
Chrysene	4.577	0.10	5	0	91.5	43 - 120	4.925	7.33	20	
Dibenz(a,h)anthracene	6.035	0.10	5	0	121	45 - 125	5.721	5.33	20	
Dibenzofuran	3.573	0.10	5	0	71.5	50 - 120	3.548	0.683	20	
Diethyl phthalate	4.572	0.20	5	0	91.4	41 - 120	4.408	3.65	20	
Dimethyl phthalate	4.092	0.20	5	0	81.8	40 - 122	4.056	0.88	20	
Di-n-butyl phthalate	5.134	0.20	5	0.09641	101	45 - 123	5.063	1.39	20	
Di-n-octyl phthalate	5.926	0.20	5	0	119	45 - 129	5.768	2.69	20	
Fluoranthene	5.137	0.10	5	0	103	45 - 125	5.072	1.28	20	
Fluorene	3.915	0.10	5	0	78.3	49 - 120	3.747	4.39	20	
Hexachlorobenzene	4.052	0.20	5	0	81.0	48 - 120	3.99	1.55	20	
Hexachlorobutadiene	2.82	0.20	5	0	56.4	40 - 120	2.846	0.912	20	
Hexachlorocyclopentadiene	2.3	0.20	5	0	46.0	34 - 136	1.964	15.8	20	
Hexachloroethane	2.776	0.20	5	0	55.5	40 - 120	2.787	0.415	20	
Indeno(1,2,3-cd)pyrene	5.695	0.10	5	0	114	41 - 128	5.464	4.13	20	
Isophorone	3.11	0.20	5	0	62.2	40 - 121	3.031	2.59	20	
Naphthalene	3.103	0.10	5	0	62.1	45 - 120	3	3.37	20	
Nitrobenzene	3.355	0.20	5	0	67.1	44 - 120	3.122	7.18	20	
N-Nitrosodimethylamine	4.913	0.20	5	0	98.3	30 - 121	4.003	20.4	20	R
N-Nitrosodi-n-propylamine	2.977	0.20	5	0	59.5	40 - 120	2.858	4.07	20	
N-Nitrosodiphenylamine	4.542	0.20	5	0	90.8	40 - 125	4.457	1.89	20	
Pentachlorophenol	3.976	0.20	5	0	79.5	19 - 121	3.935	1.06	20	
Phenanthrene	4.538	0.10	5	0	90.8	45 - 121	4.524	0.298	20	
Phenol	4	0.20	5	0	80.0	20 - 124	3.412	15.8	20	
Pyrene	5.007	0.10	5	0	100	40 - 130	5.058	1.03	20	
Pyridine	4.411	1.0	5	0	88.2	15 - 120	3.374	26.6	20	R
Surr: 2,4,6-Tribromophenol	4.703	0.20	5	0	94.1	34 - 129	5.267	11.3	20	
Surr: 2-Fluorobiphenyl	2.959	0.20	5	0	59.2	40 - 125	3.021	2.05	20	
Surr: 2-Fluorophenol	4.729	0.20	5	0	94.6	20 - 120	3.409	32.4	20	R

Client: Golder Associates Inc.  
Project: Houston TX-Wood Preserving Works IDW  
WorkOrder: HS20060631

QC BATCH REPORT

Batch ID: 154506 ( 0 )      Instrument: SV-7      Method: LOW-LEVEL SEMIVOLATILES BY 8270D

MSD      Sample ID: HS20060638-01MSD      Units: ug/L      Analysis Date: 23-Jun-2020 15:53  
Client ID:      Run ID: SV-7\_363754      SeqNo: 5631988      PrepDate: 16-Jun-2020      DF: 1  
Analyte      Result      MQL      SPK Val      SPK Ref Value      %REC      Control Limit      RPD Ref Value      %RPD      RPD Limit Qual

Surr: 4-Terphenyl-d14	4.536	0.20	5	0	90.7	40 - 135	4.751	4.63	20
Surr: Nitrobenzene-d5	2.889	0.20	5	0	57.8	41 - 120	2.84	1.7	20
Surr: Phenol-d6	4.438	0.20	5	0	88.8	20 - 120	3.826	14.8	20

The following samples were analyzed in this batch: HS20060631-01

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works IDW  
**WorkOrder:** HS20060631

**QC BATCH REPORT**

Batch ID: R363574 ( 0 )		Instrument: VOA2		Method: LOW LEVEL VOLATILES BY SW8260C						
MBLK	Sample ID: VBLKW-200818	Units: ug/L			Analysis Date: 18-Jun-2020 23:00					
Client ID:	Run ID: VOA2_363574	SeqNo: 5626654	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	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 IDW  
**WorkOrder:** HS20060631

**QC BATCH REPORT**

Batch ID: R363574 ( 0 )		Instrument: VOA2		Method: LOW LEVEL VOLATILES BY SW8260C						
MBLK	Sample ID: VBLKW-200818	Units: ug/L			Analysis Date: 18-Jun-2020 23:00					
Client ID:	Run ID: VOA2_363574	SeqNo: 5626654		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>48.09</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>96.2</i>	<i>70 - 123</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>48.86</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.7</i>	<i>82 - 115</i>				
<i>Surr: Dibromofluoromethane</i>	<i>49.81</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.6</i>	<i>73 - 126</i>				
<i>Surr: Toluene-d8</i>	<i>50.36</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>81 - 120</i>				



**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works IDW  
**WorkOrder:** HS20060631

**QC BATCH REPORT**

Batch ID: R363574 ( 0 )		Instrument: VOA2		Method: LOW LEVEL VOLATILES BY SW8260C						
LCS	Sample ID: VLCSW-200818	Units: ug/L			Analysis Date: 18-Jun-2020 22:13					
Client ID:	Run ID: VOA2_363574	SeqNo: 5626680	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	20.79	1.0	20	0	104	70 - 130				
1,1,2,2-Tetrachloroethane	19.12	1.0	20	0	95.6	70 - 120				
1,1,2-Trichloroethane	19.6	1.0	20	0	98.0	77 - 113				
1,1-Dichloroethane	20.07	1.0	20	0	100	71 - 122				
1,1-Dichloroethene	21.58	1.0	20	0	108	70 - 130				
1,2-Dichlorobenzene	20.31	1.0	20	0	102	77 - 113				
1,2-Dichloroethane	19.35	1.0	20	0	96.8	70 - 124				
1,2-Dichloropropane	19.71	1.0	20	0	98.5	72 - 119				
1,3-Dichlorobenzene	20.3	1.0	20	0	102	78 - 118				
1,4-Dichlorobenzene	19.61	1.0	20	0	98.1	79 - 113				
2-Butanone	35.74	2.0	40	0	89.4	70 - 130				
2-Hexanone	37.91	2.0	40	0	94.8	70 - 130				
4-Methyl-2-pentanone	38.98	2.0	40	0	97.4	70 - 130				
Acetone	36.95	2.0	40	0	92.4	70 - 130				
Benzene	19.33	1.0	20	0	96.6	74 - 120				
Bromochloromethane	21.61	1.0	20	0	108	76 - 124				
Bromodichloromethane	19.3	1.0	20	0	96.5	74 - 122				
Bromoform	19.42	1.0	20	0	97.1	73 - 128				
Bromomethane	22.78	1.0	20	0	114	70 - 130				
Carbon disulfide	40.05	2.0	40	0	100	70 - 130				
Carbon tetrachloride	20.07	1.0	20	0	100	71 - 125				
Chlorobenzene	19.66	1.0	20	0	98.3	76 - 113				
Chloroethane	21.55	1.0	20	0	108	70 - 130				
Chloroform	19.75	1.0	20	0	98.7	71 - 121				
Chloromethane	23	1.0	20	0	115	70 - 129				
cis-1,2-Dichloroethene	19.84	1.0	20	0	99.2	75 - 122				
cis-1,3-Dichloropropene	19.69	1.0	20	0	98.4	73 - 127				
Dibromochloromethane	20.21	1.0	20	0	101	77 - 122				
Ethylbenzene	20.09	1.0	20	0	100	77 - 117				
m,p-Xylene	40.7	2.0	40	0	102	77 - 122				
Methylene chloride	20.59	2.0	20	0	103	70 - 127				
o-Xylene	20.29	1.0	20	0	101	75 - 119				
Styrene	20.53	1.0	20	0	103	72 - 126				
Tetrachloroethene	21.49	1.0	20	0	107	76 - 119				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works IDW  
**WorkOrder:** HS20060631

**QC BATCH REPORT**

<b>Batch ID:</b> R363574 ( 0 )		<b>Instrument:</b> VOA2		<b>Method:</b> LOW LEVEL VOLATILES BY SW8260C						
<b>LCS</b>	Sample ID: <b>VLCSW-200818</b>	Units: <b>ug/L</b>			Analysis Date: <b>18-Jun-2020 22:13</b>					
Client ID:	Run ID: <b>VOA2_363574</b>	SeqNo: <b>5626680</b>		PrepDate:			DF: <b>1</b>			
Analyte	Result	MLQ	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	

Toluene	19.62	1.0	20	0	98.1	77 - 118			
trans-1,2-Dichloroethene	21.21	1.0	20	0	106	72 - 127			
trans-1,3-Dichloropropene	20.09	1.0	20	0	100	77 - 119			
Trichloroethene	20.57	1.0	20	0	103	77 - 121			
Vinyl acetate	38.15	1.0	40	0	95.4	70 - 130			
Vinyl chloride	21.23	1.0	20	0	106	70 - 130			
Xylenes, Total	60.99	1.0	60	0	102	75 - 122			
1,2-Dichloroethene, Total	41.05	1.0	40	0	103	72 - 127			
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>50.71</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>70 - 130</i>			
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.02</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.0</i>	<i>82 - 115</i>			
<i>Surr: Dibromofluoromethane</i>	<i>50.22</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100</i>	<i>73 - 126</i>			
<i>Surr: Toluene-d8</i>	<i>50.26</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>81 - 120</i>			

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works IDW  
**WorkOrder:** HS20060631

**QC BATCH REPORT**

Batch ID: R363574 ( 0 )		Instrument: VOA2		Method: LOW LEVEL VOLATILES BY SW8260C						
MS	Sample ID: HS20060522-01MS	Units: ug/L			Analysis Date: 19-Jun-2020 00:34					
Client ID:	Run ID: VOA2_363574	SeqNo: 5626682	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	23.58	1.0	20	0	118	70 - 130				
1,1,2,2-Tetrachloroethane	20.13	1.0	20	0	101	70 - 123				
1,1,2-Trichloroethane	20.33	1.0	20	0	102	70 - 117				
1,1-Dichloroethane	21.83	1.0	20	0	109	70 - 127				
1,1-Dichloroethene	24.21	1.0	20	0	121	70 - 130				
1,2-Dichlorobenzene	22.06	1.0	20	0	110	70 - 115				
1,2-Dichloroethane	20.7	1.0	20	0	104	70 - 127				
1,2-Dichloropropane	22.02	1.0	20	0	110	70 - 122				
1,3-Dichlorobenzene	22.2	1.0	20	0	111	70 - 119				
1,4-Dichlorobenzene	21.49	1.0	20	0	107	70 - 114				
2-Butanone	36.21	2.0	40	0	90.5	70 - 130				
2-Hexanone	37.78	2.0	40	0	94.5	70 - 130				
4-Methyl-2-pentanone	41.04	2.0	40	0	103	70 - 130				
Acetone	40.48	2.0	40	0	101	70 - 130				
Benzene	21.56	1.0	20	0	108	70 - 127				
Bromochloromethane	23.27	1.0	20	0	116	70 - 127				
Bromodichloromethane	21.01	1.0	20	0	105	70 - 124				
Bromoform	21.04	1.0	20	0	105	70 - 129				
Bromomethane	26.7	1.0	20	0	133	70 - 130				S
Carbon disulfide	42.17	2.0	40	0	105	70 - 130				
Carbon tetrachloride	23.66	1.0	20	0	118	70 - 130				
Chlorobenzene	21.94	1.0	20	0	110	70 - 114				
Chloroethane	21.62	1.0	20	0	108	70 - 130				
Chloroform	21.56	1.0	20	0	108	70 - 125				
Chloromethane	20.91	1.0	20	0	105	70 - 130				
cis-1,2-Dichloroethene	21.55	1.0	20	0	108	70 - 128				
cis-1,3-Dichloropropene	21.44	1.0	20	0	107	70 - 125				
Dibromochloromethane	21.3	1.0	20	0	106	70 - 124				
Ethylbenzene	22.96	1.0	20	0	115	70 - 124				
m,p-Xylene	45.75	2.0	40	0	114	70 - 130				
Methylene chloride	21.16	2.0	20	0	106	70 - 128				
o-Xylene	22.71	1.0	20	0	114	70 - 124				
Styrene	17.1	1.0	20	0	85.5	70 - 130				
Tetrachloroethene	24.61	1.0	20	0	123	70 - 130				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works IDW  
**WorkOrder:** HS20060631

**QC BATCH REPORT**

**Batch ID:** R363574 ( 0 )      **Instrument:** VOA2      **Method:** LOW LEVEL VOLATILES BY SW8260C

MS		Sample ID: HS20060522-01MS			Units: ug/L		Analysis Date: 19-Jun-2020 00:34			
Client ID:		Run ID: VOA2_363574			SeqNo: 5626682		PrepDate:		DF: 1	
Analyte	Result	MLL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Toluene	21.96	1.0	20	0	110	70 - 123				
trans-1,2-Dichloroethene	23.26	1.0	20	0	116	70 - 130				
trans-1,3-Dichloropropene	21.07	1.0	20	0	105	70 - 121				
Trichloroethene	23.07	1.0	20	0	115	70 - 129				
Vinyl acetate	35.14	1.0	40	0	87.9	70 - 130				
Vinyl chloride	23.03	1.0	20	0	115	70 - 130				
Xylenes, Total	68.47	1.0	60	0	114	70 - 130				
1,2-Dichloroethene, Total	44.81	1.0	40	0	112	70 - 130				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>49.66</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.3</i>	<i>70 - 126</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.48</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.0</i>	<i>81 - 113</i>				
<i>Surr: Dibromofluoromethane</i>	<i>49.74</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.5</i>	<i>77 - 123</i>				
<i>Surr: Toluene-d8</i>	<i>50.27</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>82 - 127</i>				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works IDW  
**WorkOrder:** HS20060631

**QC BATCH REPORT**

Batch ID: R363574 ( 0 )		Instrument: VOA2		Method: LOW LEVEL VOLATILES BY SW8260C						
MSD	Sample ID: HS20060522-01MSD	Units: ug/L			Analysis Date: 19-Jun-2020 00:57					
Client ID:	Run ID: VOA2_363574	SeqNo: 5626683	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	22.33	1.0	20	0	112	70 - 130	23.58	5.48	20	
1,1,2,2-Tetrachloroethane	19.55	1.0	20	0	97.7	70 - 123	20.13	2.95	20	
1,1,2-Trichloroethane	20.13	1.0	20	0	101	70 - 117	20.33	0.97	20	
1,1-Dichloroethane	20.51	1.0	20	0	103	70 - 127	21.83	6.23	20	
1,1-Dichloroethene	23	1.0	20	0	115	70 - 130	24.21	5.1	20	
1,2-Dichlorobenzene	21.13	1.0	20	0	106	70 - 115	22.06	4.32	20	
1,2-Dichloroethane	19.99	1.0	20	0	100.0	70 - 127	20.7	3.49	20	
1,2-Dichloropropane	20.6	1.0	20	0	103	70 - 122	22.02	6.64	20	
1,3-Dichlorobenzene	21.11	1.0	20	0	106	70 - 119	22.2	5.02	20	
1,4-Dichlorobenzene	20.35	1.0	20	0	102	70 - 114	21.49	5.44	20	
2-Butanone	35.16	2.0	40	0	87.9	70 - 130	36.21	2.94	20	
2-Hexanone	37.53	2.0	40	0	93.8	70 - 130	37.78	0.679	20	
4-Methyl-2-pentanone	40.16	2.0	40	0	100	70 - 130	41.04	2.17	20	
Acetone	40.05	2.0	40	0	100	70 - 130	40.48	1.05	20	
Benzene	20.3	1.0	20	0	102	70 - 127	21.56	6	20	
Bromochloromethane	22.91	1.0	20	0	115	70 - 127	23.27	1.57	20	
Bromodichloromethane	20.08	1.0	20	0	100	70 - 124	21.01	4.5	20	
Bromoform	20.02	1.0	20	0	100	70 - 129	21.04	4.95	20	
Bromomethane	23.75	1.0	20	0	119	70 - 130	26.7	11.7	20	
Carbon disulfide	40.42	2.0	40	0	101	70 - 130	42.17	4.25	20	
Carbon tetrachloride	21.87	1.0	20	0	109	70 - 130	23.66	7.86	20	
Chlorobenzene	20.39	1.0	20	0	102	70 - 114	21.94	7.32	20	
Chloroethane	19.41	1.0	20	0	97.1	70 - 130	21.62	10.8	20	
Chloroform	20.58	1.0	20	0	103	70 - 125	21.56	4.64	20	
Chloromethane	20.11	1.0	20	0	101	70 - 130	20.91	3.94	20	
cis-1,2-Dichloroethene	20.86	1.0	20	0	104	70 - 128	21.55	3.25	20	
cis-1,3-Dichloropropene	20.18	1.0	20	0	101	70 - 125	21.44	6.06	20	
Dibromochloromethane	20.5	1.0	20	0	103	70 - 124	21.3	3.79	20	
Ethylbenzene	21.59	1.0	20	0	108	70 - 124	22.96	6.15	20	
m,p-Xylene	43.2	2.0	40	0	108	70 - 130	45.75	5.74	20	
Methylene chloride	20.07	2.0	20	0	100	70 - 128	21.16	5.29	20	
o-Xylene	21.25	1.0	20	0	106	70 - 124	22.71	6.64	20	
Styrene	15.57	1.0	20	0	77.8	70 - 130	17.1	9.38	20	
Tetrachloroethene	23.34	1.0	20	0	117	70 - 130	24.61	5.29	20	

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works IDW  
**WorkOrder:** HS20060631

**QC BATCH REPORT**

**Batch ID:** R363574 ( 0 )      **Instrument:** VOA2      **Method:** LOW LEVEL VOLATILES BY SW8260C

<b>MSD</b>		Sample ID: <b>HS20060522-01MSD</b>			Units: <b>ug/L</b>		Analysis Date: <b>19-Jun-2020 00:57</b>			
Client ID:		Run ID: <b>VOA2_363574</b>			SeqNo: <b>5626683</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MLQ	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Toluene	20.68	1.0	20	0	103	70 - 123	21.96	5.98	20	
trans-1,2-Dichloroethene	22.66	1.0	20	0	113	70 - 130	23.26	2.63	20	
trans-1,3-Dichloropropene	20.19	1.0	20	0	101	70 - 121	21.07	4.24	20	
Trichloroethene	21.92	1.0	20	0	110	70 - 129	23.07	5.09	20	
Vinyl acetate	35.22	1.0	40	0	88.1	70 - 130	35.14	0.223	20	
Vinyl chloride	21.32	1.0	20	0	107	70 - 130	23.03	7.72	20	
Xylenes, Total	64.46	1.0	60	0	107	70 - 130	68.47	6.04	20	
1,2-Dichloroethene, Total	43.52	1.0	40	0	109	70 - 130	44.81	2.93	20	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>49.86</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.7</i>	<i>70 - 126</i>	<i>49.66</i>	<i>0.411</i>	<i>20</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.28</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.6</i>	<i>81 - 113</i>	<i>49.48</i>	<i>0.387</i>	<i>20</i>	
<i>Surr: Dibromofluoromethane</i>	<i>49.75</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.5</i>	<i>77 - 123</i>	<i>49.74</i>	<i>0.0181</i>	<i>20</i>	
<i>Surr: Toluene-d8</i>	<i>49.7</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.4</i>	<i>82 - 127</i>	<i>50.27</i>	<i>1.14</i>	<i>20</i>	

The following samples were analyzed in this batch: HS20060631-01

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works IDW  
**WorkOrder:** HS20060631

**QC BATCH REPORT**

<b>Batch ID:</b> 154628 ( 0 )	<b>Instrument:</b> UV-2450	<b>Method:</b> CYANIDE - SW9014
-------------------------------	----------------------------	---------------------------------

<b>MBLK</b>	Sample ID: <b>MBLK-154628</b>	Units: <b>mg/L</b>	Analysis Date: <b>18-Jun-2020 14:30</b>							
Client ID:	Run ID: <b>UV-2450_363520</b>	SeqNo: <b>5625451</b>	PrepDate: <b>18-Jun-2020</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual

Cyanide U 0.00500

<b>LCS</b>	Sample ID: <b>LCS-154628</b>	Units: <b>mg/L</b>	Analysis Date: <b>18-Jun-2020 14:30</b>							
Client ID:	Run ID: <b>UV-2450_363520</b>	SeqNo: <b>5625450</b>	PrepDate: <b>18-Jun-2020</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual

Cyanide 0.174 0.00500 0.2 0 87.0 80 - 120

<b>MS</b>	Sample ID: <b>HS20060758-01MS</b>	Units: <b>mg/L</b>	Analysis Date: <b>18-Jun-2020 14:30</b>							
Client ID:	Run ID: <b>UV-2450_363520</b>	SeqNo: <b>5625448</b>	PrepDate: <b>18-Jun-2020</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual

Cyanide 0.178 0.00500 0.2 0.007 85.5 80 - 120

<b>MSD</b>	Sample ID: <b>HS20060758-01MSD</b>	Units: <b>mg/L</b>	Analysis Date: <b>18-Jun-2020 14:30</b>							
Client ID:	Run ID: <b>UV-2450_363520</b>	SeqNo: <b>5625449</b>	PrepDate: <b>18-Jun-2020</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual

Cyanide 0.176 0.00500 0.2 0.007 84.5 80 - 120 0.178 1.13 20

The following samples were analyzed in this batch: HS20060631-01

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works IDW  
**WorkOrder:** HS20060631

**QC BATCH REPORT**

**Batch ID:** R363190 ( 0 )      **Instrument:** WetChem\_HS      **Method:** FLASH POINT BY PENSKY-MARTENS SW1010A

**LCS**      Sample ID: **LCS-R363190**      Units: °F      Analysis Date: **13-Jun-2020 08:00**  
 Client ID:      Run ID: **WetChem\_HS\_363190** SeqNo: **5618211** PrepDate:      DF: **1**  
 Analyte      Result      MQL      SPK Val      SPK Ref Value      %REC      Control Limit      RPD Ref Value      %RPD      RPD Limit Qual

Ignitability      79.3      70.0      81      0      97.9      95 - 105

**DUP**      Sample ID: **HS20060571-01DUP**      Units: °F      Analysis Date: **13-Jun-2020 08:00**  
 Client ID:      Run ID: **WetChem\_HS\_363190** SeqNo: **5618212** PrepDate:      DF: **1**  
 Analyte      Result      MQL      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 IDW  
**WorkOrder:** HS20060631

**QC BATCH REPORT**

**Batch ID:** R363578 ( 0 )      **Instrument:** WetChem\_HS      **Method:** SULFIDE BY SM4500 S2-F

**MBLK**      Sample ID: **MBLK-R363578**      Units: **mg/L**      Analysis Date: **18-Jun-2020 17:50**  
 Client ID:      Run ID: **WetChem\_HS\_363578** SeqNo: **5626816**      PrepDate:      DF: **1**  
 Analyte      Result      MQL      SPK Val      SPK Ref Value      %REC      Control Limit      RPD Ref Value      %RPD      RPD Limit Qual

Sulfide      U      1.00

**LCS**      Sample ID: **LCS-R363578**      Units: **mg/L**      Analysis Date: **18-Jun-2020 17:50**  
 Client ID:      Run ID: **WetChem\_HS\_363578** SeqNo: **5626815**      PrepDate:      DF: **1**  
 Analyte      Result      MQL      SPK Val      SPK Ref Value      %REC      Control Limit      RPD Ref Value      %RPD      RPD Limit Qual

Sulfide      23.6      1.00      25      0      94.4      85 - 115

**LCSD**      Sample ID: **LCSD-R363578**      Units: **mg/L**      Analysis Date: **18-Jun-2020 17:50**  
 Client ID:      Run ID: **WetChem\_HS\_363578** SeqNo: **5626814**      PrepDate:      DF: **1**  
 Analyte      Result      MQL      SPK Val      SPK Ref Value      %REC      Control Limit      RPD Ref Value      %RPD      RPD Limit Qual

Sulfide      23.8      1.00      25      0      95.2      85 - 115      23.6      0.844      20

**MS**      Sample ID: **HS20060631-01MS**      Units: **mg/L**      Analysis Date: **18-Jun-2020 17:50**  
 Client ID: **WG-1620-IDWW01-20200611**      Run ID: **WetChem\_HS\_363578** SeqNo: **5626817**      PrepDate:      DF: **200**  
 Analyte      Result      MQL      SPK Val      SPK Ref Value      %REC      Control Limit      RPD Ref Value      %RPD      RPD Limit Qual

Sulfide      4920      200      5000      200      94.4      80 - 120

The following samples were analyzed in this batch: HS20060631-01

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works IDW  
**WorkOrder:** HS20060631

**QC BATCH REPORT**

**Batch ID:** R363579 ( 0 )      **Instrument:** WetChem\_HS      **Method:** PH BY SW9040C

**DUP**      Sample ID: **HS20060577-04DUP**      Units: **pH Units**      Analysis Date: **19-Jun-2020 12:12**  
 Client ID:      Run ID: **WetChem\_HS\_363579** SeqNo: **5626792**      PrepDate:      DF: **1**  
 Analyte      Result      MQL      SPK Val      SPK Ref Value      %REC      Control Limit      RPD Ref Value      %RPD      RPD Limit Qual

pH	6.82	0.100						6.85	0.439	10
Temp Deg C @pH	23.5	0						23.7	0.847	10

The following samples were analyzed in this batch:

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works IDW  
**WorkOrder:** HS20060631

**QUALIFIERS,  
ACRONYMS, UNITS**

<b>Qualifier</b>	<b>Description</b>
*	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

<b>Acronym</b>	<b>Description</b>
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

<b>Unit Reported</b>	<b>Description</b>
mg/L	Milligrams per Liter

**CERTIFICATIONS,ACCREDITATIONS & LICENSES**

<b>Agency</b>	<b>Number</b>	<b>Expire Date</b>
Arkansas	20-030-0	26-Mar-2021
Dept of Defense	ANAB L2231 V009	22-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322020-4	09-May-2021
Kansas	E-10352 2019-2020	31-Jul-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2020	31-Dec-2020
Oklahoma	2019-141	31-Aug-2020
Texas	T104704231-20-26	30-Apr-2021

Sample Receipt Checklist

Work Order ID: HS20060631

Date/Time Received: 11-Jun-2020 17:15

Client Name: PBW

Received by: Patrick Salome

Completed By: <u>/S/ Nilesch D. Ranchod</u>	12-Jun-2020 12:02	Reviewed by: <u>/S/ Dane J. Wacasey</u>	17-Jun-2020 13:11
eSignature	Date/Time	eSignature	Date/Time

Matrices: **Water**

Carrier name: **ALS Courier**

- Shipping container/cooler in good condition? Yes  No  Not Present
- Custody seals intact on shipping container/cooler? Yes  No  Not Present
- Custody seals intact on sample bottles? Yes  No  Not Present
- VOA/TX1005/TX1006 Solids in hermetically sealed vials? Yes  No  Not Present
- Chain of custody present? Yes  No  1 Page(s)
- Chain of custody signed when relinquished and received? Yes  No  COC IDs:217838
- Samplers name present on COC? Yes  No
- Chain of custody agrees with sample labels? Yes  No
- Samples in proper container/bottle? Yes  No
- Sample containers intact? Yes  No
- Sufficient sample volume for indicated test? Yes  No
- All samples received within holding time? Yes  No
- Container/Temp Blank temperature in compliance? Yes  No

Temperature(s)/Thermometer(s):	1.6°C UC/C	IR # 25
Cooler(s)/Kit(s):	45538	
Date/Time sample(s) sent to storage:	06/11/2020 20:00	

- Water - VOA vials have zero headspace? Yes  No  No VOA vials submitted
- Water - pH acceptable upon receipt? Yes  No  N/A
- pH adjusted? Yes  No  N/A

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:



Cincinnati, OH  
+1 513 733 5336

Fort Collins, CO  
+1 970 490 1511

Everett, WA  
+1 425 356 2600

Holland, MI  
+1 616 399 6070

# Chain of Custody Form

## HS20060631

Page \_\_\_\_ of \_\_\_\_

COC ID: 217838

Golder Associates Inc.  
Houston TX-Wood Preserving Works




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 (5632528 Volatile Organics)										
Work Order		Project Number	1620-16-Rev1 SR 92688 (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 Semivolatile Organics)										
Send Report To	Eric Matzner	Invoice Attn	Accounts Payable	D	ICP_TW (5652643 5652646 RCRA 8+3 Metals)										
Address	2201 Double Creek Drive Suite 4004	Address	1400 Douglas Street Stop 0750	E	CN_TW_9014 (5632370 Cyanide - RCI)										
				F	SULFD_4500S F (5636267 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 IDWW 0120200611	6-11-2020	12:00	Water	1,2,4,7,8	12	X	X	X	X	X	X	X	X			
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign <i>Jim McSpadden</i>		Shipment Method		Required Turnaround Time: (Check Box)				Results Due Date:	
<i>Jim McSpadden</i>				<input checked="" type="checkbox"/> STD 10 Wk Days <input type="checkbox"/> 5 Wk Days <input type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 hour					
Relinquished by:	Date:	Time:	Received by:	Notes: UPRR HWPW 1620-16					
<i>Jim McSpadden</i>	6-11-2020	13:35	<i>Kevin Peterburs</i>						
Relinquished by:	Date:	Time:	Received by (Laboratory):	Cooler ID	Cooler Temp.	QC Package: (Check One Box Below)			
<i>Kevin Peterburs</i>	6-11-20	17:15	<i>Kevin Peterburs</i>	45538	1.6	<input checked="" type="checkbox"/> Level II Std QC <input type="checkbox"/> RRP Checklist <input type="checkbox"/> Level III Std QC/Raw Data <input type="checkbox"/> RRP Level IV <input type="checkbox"/> Level IV SW643/CLP <input type="checkbox"/> Other			
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):						
<i>Kevin Peterburs</i>			<i>Kevin Peterburs</i>						
Preservative Key: 1-HCl 2-HNO <sub>3</sub> 3-H <sub>2</sub> SO <sub>4</sub> 4-NaOH 5-Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> 6-NaHSO <sub>4</sub> 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.

 <p><b>ALS</b> 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887</p>	<p><b>CUSTOMER BODY SEAL</b></p> <p>Date: <u>6-17-20</u> Time: <u>10:30</u>          Name: <u>Tim M. Speed</u>          Company: <u>Go-Liner</u></p>		<p>Signature By: <u>PR</u></p>	
			<p>455 3E</p>	<p>Date: <u>6-17-2020</u></p>
			<p>6-17-20</p>	