

August 23, 2022

Project No. 19119232

Ms. Maureen Hatfield

MC-127
VCP-CA Section, Remediation Division
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, TX 78711-3087

**RE: DNAPL RECOVERY ACTIVITIES QUARTERLY REPORT – 2ND QUARTER 2022
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 USA Inc. (Golder), a member of WSP, on behalf of Union Pacific Railroad Company (UPRR), submits this 2nd Quarter 2022 summary report for the dense non-aqueous phase liquid (DNAPL) recovery activities conducted at the UPRR Houston Wood Preserving Works Facility (the Site).

DNAPL Recovery Summary – 2nd Quarter 2022

Below is a summary of the DNAPL recovery activities for the 2nd Quarter 2022:

- Of the 15 wells used for DNAPL recovery, one well (MW-32B) exhibited measurable of DNAPL greater than a trace amount during the 2nd Quarter 2022. Two wells were either damaged (MW-44C) or not accessible (MW-75B) during the quarter. One well was not accessible during the two recovery events in June 2022 (MW-45C).
- Approximately 7.4 gallons of DNAPL were recovered during the 2nd Quarter 2022.

DNAPL Recovery Procedures

As detailed in the Response Action Plan (RAP) dated November 24, 2014, a 24-month DNAPL recovery pilot test, consisting of manual DNAPL recovery from selected wells on a monthly basis, was conducted at the Site. Following the 24-month pilot testing period, the DNAPL recovery activities have continued monthly following the same procedures detailed in the RAP. In response to the Texas Commission on Environmental Quality (TCEQ) Technical Notice of Deficiency dated April 11, 2019, the DNAPL recovery frequency was increased to bi-monthly (twice a month) in June 2019.

The following monitoring wells are part of the current DNAPL recovery activities:

Well Name	Zone
MW-57A	A-TZ

Well Name	Zone
MW-78A	A-TZ
MW-12B	B-TZ
MW-32B	B-CZ
MW-41B	B-TZ
MW-49B	B-CZ
MW-57B	B-CZ
MW-68B	B-TZ
MW-70B	B-CZ
MW-74B*	B-TZ
MW-75B	B-CZ
MW-23C	C-TZ
MW-34CR	C-TZ
MW-44C	C-TZ
MW-45C	C-TZ
MW-46C	C-TZ

* Well MW-74B was added to the list of recovery wells beginning in May 2021 after measurable DNAPL was noted during site-wide gauging activities. The locations of the DNAPL recovery wells are shown on Figure 1.

DNAPL recovery activities consist of measuring the depth to groundwater surface, the depth to groundwater/DNAPL interface, and the total depth of the well relative to the top of casing prior to DNAPL recovery. DNAPL recovery from each well is then performed using a peristaltic pump or submersible pump. Beginning in October 2019, the DNAPL encountered in MW-12B and MW-41B was too thick for the submersible pump to efficiently recover. Two stainless steel pneumatic pulse pumps (gas displacement pumps) from QED Environmental Systems (model LP1301) were installed in MW-12B and MW-41B on March 30, 2020. These pumps are designed for recovering the more viscous liquids observed in these wells. DNAPL is pumped from the bottom of each well until groundwater returns in the pump discharge. The volume of recovered DNAPL is estimated from each well based on the volume pumped, and the well is gauged to measure the total depth of the well and depth to DNAPL following pumping. Recovered DNAPL from all the wells is consolidated into a 55-gallon drum and temporarily stored at the Containment Storage Area at the Site pending disposal at TCEQ-permitted facilities including the Clean Harbors Deer Park Facility in La Porte, Texas or the US Ecology Robstown Facility in Robstown, Texas. The most recent waste manifest for the disposal of recovered DNAPL and groundwater is provided in Attachment 1.

2nd Quarter 2022 DNAPL Recovery Activities

A summary of the DNAPL recovery measurements from February 2013 through June 2022 is provided in Table 1. DNAPL thicknesses listed on the table and referenced in this letter are “in-well thicknesses”. A graph of DNAPL thicknesses prior to each recovery effort over time from February 2013 through June 2022 is presented on Figure 2, with individual graphs for each zone and/or portion of the Site (Figures 3 through 7) discussed below. Observations from the 2nd Quarter 2022 gauging and recovery activities are provided below for each of the groundwater bearing units (GWBUs):

- A-TZ Wells: Recovery wells MW-57A and MW-78A completed in the A-TZ were evaluated for DNAPL recovery during this period (graph of DNAPL thickness from July 2018 through June 2022 shown on Figure 3).

- o **MW-57A:** No DNAPL was detected in MW-57A during the 2nd Quarter of 2022. DNAPL has not been detected in this well since May 2019 where a trace was measured.
- o **MW-78A:** No DNAPL was detected in MW-78A during April or May 2022. A trace amount of DNAPL was detected but not measurable during the June 16, 2022 and June 30, 2022 events. Measurable DNAPL has not been detected in this well since December 2020.
- **B-TZ Wells (West Side):** Recovery wells MW-12B and MW-41B completed in the B-TZ were evaluated for DNAPL recovery during this period (graph of DNAPL thickness from July 2018 through June 2022 shown on Figure 4).
 - MW-12B:** During all recovery events of the 2nd Quarter 2022, the groundwater/DNAPL interface was below the top of the pneumatic pulse pump at MW-12B. As a result, the interface probe could not get past the pump assembly, and it was not possible to record a DNAPL thickness in the well. On October 8, 2021, the pump was removed in order to verify the total depth of the well and length of the pump. The pump length was measured to be 1.55 feet. Based on the measured length of the pump assembly, the assumption is there is less than 1.55 feet of DNAPL in the well. Approximately 4.6 gallons of DNAPL were recovered using the pneumatic pump from MW-12B during the 2nd Quarter 2022.
 - o **MW-41B:** Similar to MW-12B, the top of the groundwater/DNAPL interface in MW-41B was below the top of the pneumatic pulse pump on all recovery events of 2nd Quarter 2022. On October 8, 2021, the pump length was measured to be 1.55 feet. Based on measured length of the pump assembly, the assumption is there is less than 1.55 feet of DNAPL in the well. Approximately 5.35 gallons of DNAPL were recovered using the pneumatic pump from MW-41B during the 2nd Quarter 2022.
- **B-TZ/B-CZ Wells (North (on-site and off-site)):** Recovery wells MW-32B, MW-57B, MW-68B, and MW-70B completed in either the B-TZ or B-CZ on the north side of the Site or off-site to the north were evaluated for DNAPL recovery during this period (graph of DNAPL thickness from July 2018 through June 2022 shown on Figure 5).
 - o **MW-32B (off-site):** During the 2nd Quarter 2022, DNAPL thicknesses overall decreased from 0.84 feet on May 20, 2022, to 0.35 feet on June 16, 2022, and only a trace amount was observed on June 30, 2022. The measurement on June 30th is the least amount of DNAPL measured in MW-32B since recovery efforts began in 2013. Approximately 2.6 gallons of DNAPL were recovered from MW-32B during the 2nd Quarter 2022.
 - o **MW-57B (on-site):** Since June 2016, no measurable DNAPL has been detected in MW-57B. In the 2nd Quarter 2022, no DNAPL was detected in April or May 2022. However, a trace amount of DNAPL was detected but not measurable during the June 16, 2022 and June 30, 2022 events.
 - o **MW-68B (off-site):** No DNAPL was detected during the 2nd Quarter 2022. No measurable DNAPL has been detected in MW-68B since July 2021.

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- o **MW-70B (off-site):** No measurable DNAPL was detected in MW-70B during the 2nd Quarter 2022. A trace amount of DNAPL was detected but not measurable during the May 2, 2022 event. No DNAPL was recovered from this well during 2nd Quarter 2022.
 - **B-TZ/B-CZ Wells (Englewood Intermodal Yard):** Recovery wells MW-49B, MW-74B, and MW-75B in the Englewood Intermodal Yard completed in the B-CZ and B-TZ were evaluated for DNAPL recovery during this period (graph of DNAPL thickness from July 2018 through June 2022 shown on Figure 6).
 - o **MW-49B:** No DNAPL was detected in MW-49B and no DNAPL was recovered from this well during the 2nd Quarter 2022. The last time measurable DNAPL was detected in this well was on February 10, 2022 when a thickness of 2.76 feet was detected and approximately 0.3 gallons of DNAPL were recovered.
 - o **MW-74B:** No DNAPL was detected in MW-74B during April or May 2022. A trace amount of DNAPL was detected but not measurable during the June 16, 2022 and June 30, 2022 events. No DNAPL was recovered from this well during 2nd Quarter 2022.
 - o **MW-75B:** Measurable DNAPL has only been detected once in MW-75B since June 2021. However, the well was inaccessible during the 2nd Quarter 2022 DNAPL recovery events due to ongoing container operations in the intermodal yard.
 - **C-TZ Wells:** Wells MW-23C, MW-34CR, MW-44C, MW-45C, and MW-46C completed in the C-TZ were evaluated for DNAPL recovery (graph of DNAPL thickness from July 2018 through June 2022 shown on Figure 7).
 - o **MW-23C:** A trace amount of DNAPL was detected during the May 2, 2022 and June 16, 2022 events. This is a slight decrease from the 1st Quarter 2022, where a thickness of 0.99 feet was measured on February 24th, 2022. No DNAPL was recovered from this well during 2nd Quarter 2022.
 - o **MW-34CR:** In May 2014, replacement well MW-34CR was installed and gauged as part of the recovery program. However, no DNAPL has been detected in this well. Given the absence of DNAPL in this well, a graph for MW-34CR is not included in Figure 7.
 - o **MW-44C:** No measurable DNAPL had been detected in MW-44C from June 2019 (trace DNAPL noted in mid-June 2019) through May 2020. DNAPL was noted (0.39 feet thick) in MW-44C at the end of May 2020. However, it was discovered that the total depth measurement at MW-44C was approximately 10 feet higher than the well construction depth, suggesting that the well had appeared to have silted up. MW-44C was re-developed on July 24, 2020 during the site-wide monitoring activities. Over 10 feet of silt was removed, and the final measured depth of the well was within a foot of the original total depth. During the next recovery event in early August, the well appeared to have silted up again. Redevelopment was attempted a second time on October 1, 2020, but it was unsuccessful. The well will be plugged, abandoned, and replaced with a proposed recovery well as detailed in the Revised Response Action Plan (RAP) dated August 31, 2020.

- o **MW-45C:** No DNAPL was detected during the first five recovery events of the 2nd Quarter 2022. The well became inaccessible due to overgrown vegetation during the last two recovery events of the quarter and was not measured. During the previous quarter, 0.67 and 0.79 feet were detected in MW-45C on February 24, 2022, and March 10, 2022, respectively. Approximately 0.3 gallons of DNAPL was recovered from the well during the March 10, 2022, event. No DNAPL was recovered from this well during 2nd Quarter 2022.
- o **MW-46C:** No DNAPL was detected nor recovered from this well during 2nd Quarter 2022.

DNAPL Recovery: From February 2013 to June 2022, an estimated cumulative total of 958 gallons of creosote DNAPL have been recovered from the wells. Monthly DNAPL recovery volumes increased after the January 2015 event due to a change in pumping techniques. DNAPL recovery volumes ranged from approximately 0.4 to 1.5 gallons per bi-weekly event, and a total of approximately 7.4 gallons were recovered during the 2nd Quarter 2022 (Table 1). UPRR will continue to monitor the DNAPL thicknesses twice per month as discussed in the response to the TCEQ 4th Technical Notice of Deficiency (TNOD) letter (April 11, 2019).

Based on a comparison of total depth measurements from recent DNAPL recovery events and constructed total depths, a majority of the wells included in the DNAPL Recovery Activities have accumulated silt to varying degrees. UPRR plans to have the DNAPL Recovery wells re-developed during the 3rd Quarter 2022, except for MW-44C which will be plugged, abandoned and replaced according to the August 2020 RAP at a later date.

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 USA Inc.



Sarah Balke, G.I.T.
Consultant, Geologist



Eric C. Matzner, P.G.
Vice-President, Director Hydrogeologist



Texas Geoscience Firm No. 50369

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

Attachments: Table 1 - Summary of DNAPL Recovery Measurements
Figure 1 – In-Well DNAPL Thickness – June 30, 2022
Figure 2 - DNAPL Recovery Activities February 2013 – June 2022
Figure 3 – A-TZ Wells – DNAPL Recovery Activities July 2018 – June 2022
Figure 4 – B-TZ Wells (West Side) – DNAPL Recovery Activities July 2018 – June 2022
Figure 5 – B-CZ/B-TZ Wells (North (On-Site and Off-Site) – DNAPL Recovery Activities July 2018 – June 2022
Figure 6 – B-CZ/B-TZ Wells (Englewood Intermodal Yard) – DNAPL Recovery Activities July 2018 – June 2022
Figure 7 – C-TZ Wells – DNAPL Recovery Activities July 2018 – June 2022
Attachment 1 – Recovered DNAPL Waste Manifest

TABLES

TABLE 1

**SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS**

DNAPL Recovery Date	MW-12B				MW-23C				MW-32B			
	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)
2/14/2013	9.06	39.87	5.93	2.5	NM	NM	NM	0	6.01	30.06	6.23	2
4/3/2013	9.41	39.95	5.85	1.0	NM	NM	NM	0	4.86	33.61	2.68	1
4/22/2013	8.61	31.64	14.16	0.5*	NM	NM	NM	0	5.62	36.08	0.21	0.3
5/30/2013	8.47	37.62	8.18	1.5*	NM	NM	NM	0	5.86	32.21	4.08	2
6/29/2013	9.62	38.22	7.58	1.5	NM	NM	NM	0	6.79	33.59	2.7	1.5
7/22/2013	11.16	39.04	6.76	1.0	NM	NM	NM	0	7.14	33.91	2.38	1.5
8/26/2013	11.31	39.61	6.19	1.0	NM	NM	NM	0	7.48	33.83	2.46	1
9/27/2013	11.17	40.63	5.17	1.0	NM	NM	NM	0	7.23	34.39	1.9	1
10/31/2013	11.09	43.71	2.09	1.0	NM	NM	NM	0	7.16	34.96	1.33	0.5
11/27/2013	11.17	44.06	1.74	1.0	NM	NM	NM	0	7.29	35.03	1.26	0.5
12/31/2013	11.02	44.62	1.18	1.0	NM	NM	NM	0	7.16	35.16	1.13	0.5
1/30/2014	11.34	45.12	0.68	1.0	NM	NM	NM	0	6.72	34.82	1.47	0.5
3/3/2014	11.17	44.32	1.48	1.0	NM	NM	NM	0	6.53	34.52	1.77	0.5
3/31/2014	11.03	44.53	1.27	1.0	NM	NM	NM	0	6.29	34.21	2.08	0.5
4/30/2014	10.92	44.26	1.54	1.0	NM	NM	NM	0	6.42	34.67	1.62	0.5
5/27/2014	10.81	44.34	1.46	1.0	NM	NM	NM	0	6.36	34.72	1.57	0.5
6/26/2014	10.72	44.61	1.19	1.0	NM	NM	NM	0	6.21	34.61	1.68	0.5
7/31/2014	10.13	44.96	0.84	1.0	NM	NM	NM	0	6.06	34.33	1.96	0.3
8/27/2014	10.26	45.12	0.68	1.0	NM	NM	NM	0	6.18	34.98	1.31	0.3
10/3/2014	10.17	44.91	0.89	1.0	NM	NM	NM	0	6.06	34.72	1.57	0.3
11/3/2014	10.29	44.97	0.83	1.0	22.51	70.71	2.09	0.3	6.18	34.91	1.38	0.3
11/24/2014	10.27	44.99	0.81	1.0	22.56	70.92	1.88	0.5	6.21	35.16	1.13	0.5
12/22/2014	10.23	44.71	1.09	1.0	22.47	70.81	1.99	0.5	6.14	35.02	1.27	0.8
1/29/2015	10.16	44.96	0.84	1.0	22.26	71.04	1.76	0.5	5.71	35.29	1	0.8
2/26/2015	10.12	44.96	0.84	1.5	22.06	71.09	1.71	0.5	6.02	35.29	1	1
3/26/2015	9.96	45.21	0.59	1.5	22.17	71.12	1.68	0.3	5.46	35.36	0.93	1
4/27/2015	9.89	45.37	0.43	1.5	22.23	71.06	1.74	0.5	5.21	35.29	1	1
5/26/2015	9.72	45.61	0.19	2.0	22.17	71.14	1.66	0.5	5.07	35.46	0.83	1
7/6/2015	7.12	45.96	0.24	2.0	19.01	71.39	1.41	0.5	4.06	35.66	0.63	1
8/3/2015	7.26	46.09	0.11	2.0	19.16	71.46	1.34	0.8	4.29	35.71	0.58	1
8/27/2015	8.09	46.01	0.19	1.0	20.34	71.51	1.29	0.8	5.05	35.77	0.52	1
10/5/2015	7.12	45.86	0.34	1.0	19.02	71.57	1.23	0.5	4.31	35.96	0.33	1
11/5/2015	6.86	45.81	0.39	1.0	18.59	71.59	1.21	0.5	4.02	35.91	0.38	1
12/3/2015	6.46	45.79	0.41	1.0	18.33	71.67	1.13	0.5	3.92	35.96	0.33	1
12/28/2015	6.23	45.62	0.58	1.3	23.21	71.61	1.19	0.8	3.73	35.91	0.38	1
2/3/2016	6.04	45.55	0.65	1.5	17.96	71.64	1.16	0.5	3.61	35.87	0.42	1
3/3/2016	5.96	45.61	0.59	1.5	17.92	71.71	1.09	0.5	3.51	35.91	0.38	1
3/31/2016	6.06	45.72	0.48	1.5	17.86	71.79	1.01	0.5	3.56	35.92	0.37	1
5/3/2016	6.13	45.66	0.54	1.0	NM	NM	NM	0.0	3.67	35.87	0.53	0.5
6/2/2016	6.21	45.61	0.59	1.0	22.9	71.51	1.29	0.5	3.74	35.92	0.48	0.5
7/8/2016	6.29	45.72	0.48	1.0	23.09	71.52	1.28	0.3	3.91	35.96	0.44	0.5
8/3/2016	6.34	45.77	0.43	1.0	23.16	71.66	1.14	0.3	4.03	35.49	0.91	0.5
8/30/2016	6.47	45.69	0.51	1.0	23.31	71.61	1.19	0.5	4.22	36.09	0.31	0.5
9/30/2016	6.59	45.81	0.39	1.0	23.39	71.81	0.99	0.5	4.33	35.91	0.49	0.5
11/3/2016	6.64	45.92	0.28	1.0	23.41	71.98	0.82	0.5	4.47	35.99	0.41	0.5
11/30/2016	6.86	45.86	0.34	0.5	23.59	71.91	0.89	0.8	4.62	35.91	0.49	0.5
1/4/2017	7.02	45.81	0.39	0.5	23.74	71.82	0.98	0.8	4.83	36.02	0.38	0.3
2/7/2017	6.97	45.69	0.51	0.5	23.67	71.74	1.06	0.8	4.81	35.91	0.49	0.3
3/2/2017	6.91	45.64	0.56	0.5	23.54	76.82	0.98	0.8	4.66	35.97	0.43	0.3
4/3/2017	6.82	45.71	0.49	0.5	23.46	76.96	0.84	0.8	4.57	36.01	0.39	0.3
4/27/2017	6.74	45.64	0.56	0.5	23.21	77.04	0.76	0.5	4.51	36.06	0.34	0.3
5/29/2017	6.89	45.77	0.43	0.5	23.49	77.21	0.59	0.3	4.74	36.03	0.37	0.3
7/5/2017	7.01	45.71	0.49	0.5	23.61	77.27	0.53	0.3	4.86	36.13	0.27	0.3
8/1/2017	7.14	45.63	0.57	0.8	23.79	77.17	0.63	0.3	4.99	36.24	0.16	0.3
9/5/2017	7.03	45.6	0.6	1.0	23.67	77.29	0.51	0.3	4.78	36.24	0.16	0.3
10/4/2017	7.07	45.69	0.51	1.0	23.61	77.36	0.44	0.3	4.89	36.29	0.11	0.3
11/2/2017	7.11	45.76	0.44	1.0	23.74	77.42	0.38	0.3	4.96	36.26	0.14	0.3
11/29/2017	7.16	45.71	0.49	1.0	23.81	77.4	0.40	0.3	5.06	36.31	0.09	0.3
1/2/2018	6.96	45.82	0.38	1.0	23.67	77.43	0.37	0.3	4.93	36.27	0.13	0.3
2/7/2018	7.13	45.87	0.33	1.0	23.86	77.46	0.34	0.3	5.16	36.21	0.19	0.3
3/1/2018	7.36	45.96	0.24	1.0	23.96	77.41	0.39	0.3	5.38	36.13	0.27	0.3
4/2/2018	7.29	45.94	0.26	1.0	23.9	77.32	0.48	0.5	5.31	36.18	0.22	0.3
5/1/2018	8.17	45.91	0.29	1.0	24.47	77.39	0.41	0.5	6.12	36.23	0.17	0.5
6/1/2018	8.49	45.86	0.34	1.0	24.81	77.31	0.49	0.5	6.41	36.19	0.21	0.5
6/29/2018	8.62	45.81	0.39	1.0	24.99	77.37	0.43	0.5	6.59	36.11	0.29	0.8
8/3/2018	8.79	45.96	0.24	1.0	25.12	77.39	0.41	0.5	6.74	36.19	0.21	0.8
8/31/2018	8.32	46.01	0.19	0.8	24.81	77.43	0.37	0.5	6.47	36.23	0.17	0.8
9/28/2018	8.27	45.93	0.27	0.5	24.69	77.39	0.41	0.5	6.41	36.19	0.21	0.8
11/2/2018	8.16	45.91	0.29	0.5	24.57	77.36	0.44	0.5	6.33	36.21	0.19	0.5
11/29/2018	8.01	45.9	0.30	0.5	24.36	77.3	0.50	0.5	6.21	36.27	0.13	0.3
1/2/2019	7.96	45.87	0.33	0.5	24.29	77.31	0.49	0.5	6.09	36.29	0.11	0.3
2/2/2019	7.82	45.89	0.31	0.5	24.21	77.44	0.36	0.5	5.97	36.24	0.16	0.5
2/28/2019	7.69	45.81	0.39	0.5	24.16	77.36	0.44	0.5	5.86	36.21	0.19	0.3
4/2/2019	7.61	45.8	0.4	0.5	24.08	77.32	0.48	0.5	5.79	36.24	0.16	0.3
4/25/2019	7.49	45.76	0.44	1.0	24.01	77.16	0.64	0.5	5.86	36.29	0.11	0.3
5/29/2019	7.51	45.71	0.49	1.0	24.11	77.11	0.69	0.5	5.91	36.21	0.19	0.3
6/12/2019	6.81	45.52	0.68	1.5	24.39	76.71	1.09	1.0	5.46	35.91	0.49	0.5
6/30/2019	6.67	45.06	1.14	2.0	24.32	76.67	1.13	0.8	5.39	35.42	0.98	1
7/16/2019	6.62	45.11	1.09	2.0	24.26	76.61	1.19	1.0	5.32	35.36	1.04	1
8/2/2019	6.69	45.01	1.19	1.5	24.31	76.49	1.31	1.5	5.41	35.26	1.14	1.5
8/15/2019	6.79	44.76	1.44	2.0	24.22	76.36	1.44	1.5	5.61	35.19	1.21	1.5
8/28/2019	6.88	44.71	1.49	2.0	24.29	76.41	1.39	1.5	5.72	35.22	1.18	1.5
9/17/2019	6.93	43.96	2.24	3.0	24.36	76.29	1.51	1.5	5.81	35.17	1.23	1.5
10/2/2019	6.86	43.17	3.03	0.0	24.32	76.09	1.71	1.5	5.77	35.02	1.38	1.5

TABLE 1

**SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS**

DNAPL Recovery Date	MW-12B				MW-23C				MW-32B			
	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)
10/16/2019	6.71	30.29	15.91	0.0	25.75	75.89	1.91	1.5	4.36	33.42	2.98	1.5
10/31/2019	6.53	21.63	24.57	0.0	26.33	75.29	2.51	1.5	3.43	31.86	4.54	1.5
11/15/2019	7.21	19.12	27.08	0.5	25.69	ND	0	0.0	3.47	35.7	0.7	1
12/3/2019	7.55	27.37	18.83	0.0	26.11	75.12	2.68	1.5	4.33	35.51	0.89	0
12/18/2019	12.68	35.9	10.3	0.0	26.13	77.4	0.4	0.3	4.71	35.61	0.79	1.5
12/30/2019	8.08	28.12	18.08	0.0	26.48	76.1	1.7	0.1	5.04	34.28	2.12	1.5
1/7/2020	--	--	--	--	--	--	--	--	--	--	--	--
1/15/2020	7.47	27.12	19.08	0.0	26.49	77.1	0.7	0.0	4.1	35.4	1	1
1/27/2020	6.28	21.06	25.14	0.0	25.99	76.58	1.22	0.0	3.01	31.15	5.25	1
2/13/2020	6.91	20.42	25.78	0.0	25.51	76.42	1.38	0.0	3.88	31.39	5.01	1
2/25/2020	6.4	23.6	22.6	0.0	25.6	75.5	2.3	0.1	3.9	31.05	5.35	0.8
3/13/2020	7.61	22.01	24.19	0.0	25.66	77.08	0.72	0.0	4.32	32.46	3.94	1.3
3/31/2020	7.88	22.01**	24.19	2.5	25.9	77.12	0.68	0.0	4.63	33.3	3.1	0.3
4/9/2020	7.37	18.21	27.99	3.0	25.91	77.22	0.58	0.0	4.65	30.14	6.26	1.0
4/27/2020	8.64	19.12	27.08	3.5	26.31	76.45	1.35	0.0	5.39	34.52	1.88	0.5
5/14/2020	9.39	33.16	13.04	2.5	26.7	75.89	1.91	0.1	6.02	34.73	1.67	0.5
5/28/2020	8.79	40.29	5.91	1.5	26.75	75.71	2.09	0.1	5.84	34.35	2.05	1.0
6/11/2020	9.29	40.69	5.51	2.5	26.93	ND	0	0.0	5.89	35.01	1.39	0.3
6/25/2020	9.01	BP	NM	2.0	25.89	77.94	0	0.0	5.6	35.12	1.28	0.3
7/9/2020	8.04	BP	NM	1.0	26.64	76	1.8	0.3	4.83	35.18	1.22	0.3
7/23/2020	8.17	BP	NM	2.5	26.81	75.61	2.19	0.3	5.63	34.7	1.7	1.0
8/6/2020	5.43	BP	NM	1.0	26.41	75.52	2.28	0.3	3.88	33.94	2.46	1.3
8/20/2020	8.03	BP	NM	1.0	26.38	75.4	2.4	0.3	4.87	33.87	2.53	0.5
9/2/2020	8.89	BP	NM	1.0	26.71	76.24	1.56	0.5	5.54	35.21	1.19	0.3
9/17/2020	9.84	BP	NM	0.0	26.99	75.9	1.9	0.5	6.01	34.4	2	0.5
10/1/2020	6.9	BP	NM	0.5	26.59	75.08	2.72	0.3	4.88	35.18	1.22	0.3
10/14/2020	8.42	BP	NM	2.5	26.71	75.08	2.72	0.3	4.95	34.26	2.14	0.5
10/28/2020	8.31	BP	NM	2.0	26.84	75.81	1.99	0.3	5.31	33.94	2.46	0.8
11/12/2020	9.19	BP	NM	1.0	27.12	76.12	1.68	TR	5.79	33.71	2.69	2.5
11/23/2020	9.55	BP	NM	0.8	27.41	76.28	1.52	0.3	6.24	34.19	2.21	1.0
12/10/2020	6.67	BP	NM	1.5	26.72	76.2	1.6	0.3	3.68	32.9	3.5	1.0
12/21/2020	5.46	BP	NM	0.8	26.21	NM	NM	0.0	3.89	32.82	3.58	1.0
1/7/2021	5.01	BP	NM	1.0	25.85	ND	0	0.0	3.02	35.4	1	1.0
1/21/2021	5.72	BP	NM	2.0	25.49	75.29	2.51	0.3	3.48	35.01	1.39	1.0
2/4/2021	6.87	BP	NM	1.5	25.48	75.36	2.44	1.3	4.09	34.48	1.92	1.0
2/23/2021	5.47	BP	NM	1.0	25.25	75.61	2.19	1.0	3.19	33.59	2.81	1.0
3/11/2021	5.95	BP	NM	0.8	25.31	75.84	1.96	1.0	3.47	34.05	2.35	1.0
3/25/2021	9.28	BP	NM	1.0	25.2	75.62	2.18	1.0	3.85	34.83	1.57	1.0
4/8/2021	7.52	BP	NM	1.0	25.38	75.4	2.4	1.0	4.92	33.7	2.7	1.0
4/22/2021	8.42	BP	NM	1.0	25.94	76.35	1.45	0.1	5.03	34.2	2.2	1.0
5/4/2021	6.82	BP	NM	1.0	25.95	75.25	2.55	1.0	4.26	34.6	1.8	1.0
5/20/2021	5.52	BP	NM	1.0	25.84	75.66	2.14	1.0	3.55	34.2	2.2	1.0
6/3/2021	5.46	BP	NM	1.0	25.19	75.74	2.06	0.5	2.54	34.6	1.8	1.0
6/17/2021	6.67	BP	NM	1.0	25.06	75.62	2.18	0.5	3.08	33.98	2.42	1.0
7/1/2021	5.46	BP	NM	1.0	24.72	75.12	2.68	0.5	2.61	34.38	2.02	1.0
7/19/2021	5.08	BP	NM	1.0	23.99	74.9	2.9	0.5	2.68	34.18	2.22	0.5
7/29/2021	7.1	BP	NM	1.0	24.19	75.25	2.55	0.3	3.71	34.10	2.3	0.5
8/12/2021	8.71	BP	NM	1.0	24.96	75.72	2.08	0.3	4.96	34.19	2.21	1.0
8/26/2021	8.93	BP	NM	1.0	25.42	75.81	1.99	0.5	5.2	34.8	1.6	1.0
9/10/2021	8.91	BP	NM	0.7	25.87	75.79	2.01	TR	5.68	34.48	1.92	1.1
9/22/2021	7.42	BP	NM	0	25.93	ND	0	0	4.72	31.15	5.25	1.3
10/8/2021	6.00	45.60	0.10	0	25.68	75.60	2.20	0	3.30	32.70	3.70	1.0
10/20/2021	7.81	44.00	1.70	0	26.14	ND	0	0	4.82	32.82	3.58	1.2
11/4/2021	6.03	BP	NM	0	25.57	ND	0	0	3.93	33.30	3.10	1.5
11/18/2021	6.75	BP	NM	0	25.65	74.80	1.71	0	4.3	33.61	2.79	0.3
12/3/2021	6.30	BP	NM	0	25.79	ND	0	0	4.64	32.70	3.70	1.3
12/16/2021	6.37	BP	NM	0	25.92	76.00	0.51	0	4.84	33.30	2.70	1.3
12/30/2021	6.21	BP	NM	0	25.84	ND	Trace	0	4.22	33.63	2.37	1.5
1/14/2022	6.26	ND	Trace	0	25.92	ND	Trace	0	4.31	33.74	2.26	1.5
1/26/2022	6.32	ND	Trace	0	26.01	ND	Trace	0	4.26	33.61	2.39	1.5
2/10/2022	5.70	43.50	2.20	0.12	25.65	75.3	1.2	0	3.51	34.65	1.35	0.3
2/24/2022	6.53	BP	NM	0.15	26.00	75.51	0.99	0.2	4.87	34.32	1.68	0.3
3/10/2022	6.40	BP	NM	0.2	25.96	ND	0	0	5.03	34.6	1.40	0.5
3/24/2022	6.83	BP	NM	0	26.55	ND	0	0	5.33	35.07	0.93	0.3
4/7/2022	6.98	BP	NM	0.1	26.51	ND	0	0	4.48	35.51	0.53	0.3
4/18/2022	7.49	BP	NM	0.8	26.72	ND	0	0	4.77	35.46	0.54	0.5
5/2/2022	7.95	BP	NM	1.0	26.89	ND	Trace	0	5.12	35.33	0.57	0.5
5/20/2022	6.72	BP	NM	1.0	26.39	ND	0	0	5.21	35.21	0.84	0.5
6/2/2022	6.81	BP	NM	1.0	26.31	ND	0	0	5.39	35.34	0.71	0.5
6/16/2022	9.85	BP	NM	0.5	27.62	ND	Trace	0	5.20	35.50	0.35	0.3
6/30/2022	9.91	BP	NM	0.3	27.98	ND	0	0	6.97	ND	Trace	0.1
Total DNAPL Pumped (gal)	147.8				55.5				116.2			

Notes:

* - indicates DNAPL and groundwater mixture MW-23C- added 5 feet to TOC due to capping after 2/3/2016

** - indicates DTD from previous event was used; DNAPL recovered revised based on review of field notes.

--- - No DNAPL pumped ND - Not detected

DTW - Depth to water (feet Below Top of Casing (BTOC)) NM - Not measured

DTD - Depth to DNAPL (feet BTOC) PoP - Product on probe, not measureable

MW-12B- TD measured at 46.2 instead of 45.8, August 28, 2015. TR- Trace amount of DNAPL Extracted

BP - Below pump; depth to DNAPL not measured because DNAPL is below top of in-well pump

TABLE 1

**SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS**

DNAPL Recovery Date	MW-33BR				MW-34C/MW-34CR (July 2014)				MW-41B			
	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)
2/14/2013	3.72	ND	0	0	NM	NM	NM	0	8.91	41.1	3.71	3
4/3/2013	4.02	PoP	0	0	NM	NM	NM	0	9.37	41.6	3.21	1.5
4/22/2013	3.63	ND	0	0	NM	NM	NM	0	8.62	41.6	3.21	0.5*
5/30/2013	3.59	ND	0	0	NM	NM	NM	0	8.73	34.16	10.65	2
6/29/2013	6.07	ND	0	0	NM	NM	NM	0	9.72	37.12	7.69	2
7/22/2013	9.68	ND	0	0	NM	NM	NM	0	10.31	39.29	5.52	1.5
8/26/2013	9.86	ND	0	0	NM	NM	NM	0	10.09	34.55	10.26	2.5
9/27/2013	9.57	ND	0	0	NM	NM	NM	0	9.63	37.29	7.52	2
10/31/2013	9.32	ND	0	0	21.63	NM	NM	0	9.52	38.16	6.65	2
11/27/2013	9.16	ND	0	0	NM	NM	NM	0	9.57	38.39	6.42	2
12/31/2013	8.97	ND	0	0	NM	NM	NM	0	9.42	39.36	5.45	2
1/30/2014	7.41	ND	0	0	NM	NM	NM	0	9.06	39.17	5.64	2
3/3/2014	7.16	ND	0	0	NM	NM	NM	0	8.62	38.06	6.75	2
3/31/2014	7.04	ND	0	0	NM	NM	NM	0	8.52	37.74	7.07	2
4/30/2014	6.88	ND	0	0	NM	NM	NM	0	8.36	37.21	7.6	2
5/27/2014	6.72	ND	0	0	NM	NM	NM	0	8.26	37.29	7.52	2
6/26/2014	6.52	ND	0	0	NM	NM	NM	0	8.02	37.47	7.34	2
7/31/2014	6.29	ND	0	0	19.06	ND	0	0	8.21	37.92	6.89	2
8/27/2014	6.47	ND	0	0	18.96	ND	0	0	8.07	38.29	6.52	1.5
10/3/2014	6.32	ND	0	0	18.81	ND	0	0	8.02	38.13	6.68	2
11/3/2014	NM	NM	NM	0	19.06	ND	0	0	8.22	38.29	6.52	2
11/24/2014	NM	NM	NM	0	19.11	ND	0	0	8.27	38.47	6.34	2
12/22/2014	NM	NM	NM	0	19.06	ND	0	0	8.16	38.39	6.42	2
1/29/2015	NM	NM	NM	0	18.79	ND	0	0	8.02	39.16	5.65	1.5
2/26/2015	NM	NM	NM	0	18.71	ND	0	0	7.92	39.06	5.75	2.5
3/26/2015	NM	NM	NM	0	18.67	ND	0	0	7.83	38.74	6.07	2.5
4/27/2015	NM	NM	NM	0	18.79	ND	0	0	8.02	38.61	6.2	3
5/26/2015	NM	NM	NM	0	18.63	ND	0	0	7.91	38.72	6.09	3
7/6/2015	NM	NM	NM	0	17.29	ND	0	0	6.03	38.96	5.85	2.5
8/3/2015	NM	NM	NM	0	17.21	ND	0	0	6.09	39.01	5.8	2.5
8/27/2015	NM	NM	NM	0	18.46	ND	0	0	7.39	39.14	5.67	2
10/5/2015	NM	NM	NM	0	17.29	ND	0	0	6.32	39.34	5.47	2
11/5/2015	NM	NM	NM	0	16.78	ND	0	0	6.01	39.51	5.3	2
12/3/2015	NM	NM	NM	0	16.44	ND	0	0	5.76	39.56	5.25	2
12/28/2015	NM	NM	NM	0	16.16	ND	0	0	5.62	39.63	5.18	2.3
2/3/2016	NM	NM	NM	0	15.98	ND	0	0	5.32	39.72	5.09	3
3/3/2016	NM	NM	NM	0	15.98	ND	0	0	5.17	39.81	5	3
3/31/2016	NM	NM	NM	0	15.98	ND	0	0	5.26	39.77	5.04	3
5/3/2016	NM	NM	NM	0	15.79	ND	0	0	5.52	39.96	4.85	3
6/2/2016	NM	NM	NM	0	15.97	ND	0	0	5.67	40.07	4.74	3
7/8/2016	NM	NM	NM	0	16.06	ND	0	0	5.72	40.01	4.8	3
8/3/2016	NM	NM	NM	0	16.17	ND	0	0	5.79	40.09	4.72	3
8/30/2016	NM	NM	NM	0	16.31	ND	0	0	5.91	40.26	4.55	3
9/30/2016	NM	NM	NM	0	16.42	ND	0	0	6.06	40.13	4.68	3
11/3/2016	NM	NM	NM	0	16.51	ND	0	0	6.11	40.29	4.52	3
11/30/2016	NM	NM	NM	0	16.72	ND	0	0	6.26	40.42	4.39	3
1/4/2017	NM	NM	NM	0	16.94	ND	0	0	6.39	40.56	4.25	3
2/7/2017	NM	NM	NM	0	16.91	ND	0	0	6.44	40.51	4.3	3
3/2/2017	NM	NM	NM	0	16.78	ND	0	0	6.29	40.76	4.05	3
4/3/2017	NM	NM	NM	0	16.71	ND	0	0	6.21	40.67	4.14	2.5
4/27/2017	NM	NM	NM	0	16.61	ND	0	0	6.19	40.87	3.94	3
5/29/2017	NM	NM	NM	0	16.84	ND	0	0	6.14	40.29	4.52	3
7/5/2017	NM	NM	NM	0	17.01	ND	0	0	6.34	40.57	4.24	2.5
8/1/2017	NM	NM	NM	0	17.17	ND	0	0	6.42	40.79	4.02	3
9/5/2017	NM	NM	NM	0	17.11	ND	0	0	6.36	40.68	4.13	3
10/4/2017	NM	NM	NM	0	17.06	ND	0	0	6.29	40.69	4.12	2.5
11/2/2017	NM	NM	NM	0	17.17	ND	0	0	6.41	40.73	4.08	3
11/29/2017	NM	NM	NM	0	17.29	ND	0	0	6.52	40.82	3.99	2.5
1/2/2018	NM	NM	NM	0	17.52	ND	0	0	6.72	40.72	4.09	2.5
2/7/2018	NM	NM	NM	0	18.11	ND	0	0	6.97	40.79	4.02	2.5
3/1/2018	NM	NM	NM	0	18.38	ND	0	0	7.16	40.63	4.18	2
4/2/2018	NM	NM	NM	0	18.29	ND	0	0	7.13	40.71	4.1	2
5/1/2018	NM	NM	NM	0	18.33	ND	0	0	8.26	40.76	4.05	2
6/1/2018	NM	NM	NM	0	18.62	ND	0	0	8.71	40.81	4	2.3
6/29/2018	NM	NM	NM	0	18.91	ND	0	0	9.02	40.71	4.1	2.5
8/3/2018	NM	NM	NM	0	19.06	ND	0	0	9.13	40.76	4.05	2.5
8/31/2018	NM	NM	NM	0	18.77	ND	0	0	8.89	40.86	3.95	2
9/28/2018	NM	NM	NM	0	18.64	ND	0	0	8.77	40.76	4.05	2
11/2/2018	NM	NM	NM	0	18.57	ND	0	0	8.61	40.71	4.1	2
11/29/2018	NM	NM	NM	0	18.39	ND	0	0	8.41	40.81	4	2
1/2/2019	NM	NM	NM	0	18.26	ND	0	0	8.22	40.83	3.98	2
2/2/2019	NM	NM	NM	0	18.19	ND	0	0	8.16	40.89	3.92	2
2/28/2019	NM	NM	NM	0	18.02	ND	0	0	8.03	40.76	4.05	3
4/2/2019	NM	NM	NM	0	17.96	ND	0	0	7.93	40.69	4.12	3
4/25/2019	NM	NM	NM	0	Well Damaged			0	7.76	40.28	4.53	3
5/29/2019	NM	NM	NM	0	Well Damaged			0	7.71	40.07	4.74	3
6/12/2019	NM	NM	NM	0	Well Damaged			0	7.52	39.63	5.18	3
6/30/2019	NM	NM	NM	0	Well Damaged			0	7.46	39.52	5.29	3
7/16/2019	NM	NM	NM	0	Well Damaged			0	7.39	39.46	5.35	3
8/2/2019	NM	NM	NM	0	Well Damaged			0	7.46	39.42	5.39	0
8/15/2019	NM	NM	NM	0	Well Damaged			0	7.51	39.31	5.5	3
8/28/2019	NM	NM	NM	0	Well Damaged			0	7.57	39.21	5.6	3
9/17/2019	NM	NM	NM	0	Well Damaged			0	7.66	39.02	5.79	3
10/2/2019	NM	NM	NM	0	Well Damaged			0	7.61	38.76	6.05	3

TABLE 1

**SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS**

DNAPL Recovery Date	MW-33BR				MW-34C/MW-34CR (July 2014)				MW-41B			
	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)
10/16/2019	NM	NM	NM	0	Well Damaged			0	5.21	38.67	6.14	3
10/31/2019	NM	NM	NM	0	Well Damaged			0	5.21	38.67	6.14	3
11/15/2019	NM	NM	NM	0	Well Damaged			0	4.81	38.12	6.69	2
12/3/2019	NM	NM	NM	0	Well Damaged			0	6.46	39.27	5.54	3
12/18/2019	NM	NM	NM	0	Well Damaged			0	6.51	41.7	3.11	0
12/30/2019	NM	NM	NM	0	Well Damaged			0	6.99	43.5	1.31	0
1/7/2020	--	--	--	--	--	--	--	--	--	--	--	--
1/15/2020	NM	NM	NM	0	Well Damaged			0	5.12	38.99	5.82	0
1/27/2020	NM	NM	NM	0	Well Damaged			0	3.41	40.7	4.11	0
2/13/2020	NM	NM	NM	0	Well Damaged			0	5.1	40.12	4.69	0
2/25/2020	NM	NM	NM	0	Well Damaged			0	4.5	41.12	3.69	0
3/13/2020	NM	NM	NM	0	Well Damaged			0	6.06	42.12	2.69	0
3/31/2020	NM	NM	NM	0	17.49	ND	0	0	6.82	42.12**	2.69	2
4/9/2020	NM	NM	NM	0	17.63	ND	0	0	6.47	BP	NM	2
4/27/2020	NM	NM	NM	0	17.89	ND	0	0	8.01	BP	NM	2
5/14/2020	NM	NM	NM	0	18.29	ND	0	0	8.71	42.1	2.71	3.5
5/28/2020	NM	NM	NM	0	18.31	ND	0	0	8.08	BP	NM	3.5
6/11/2020	NM	NM	NM	0	18.51	ND	0	0	8.01	41.59	3.22	2
6/25/2020	NM	NM	NM	0	17.66	ND	0	0	7.52	BP	NM	2
7/9/2020	NM	NM	NM	0	18.22	ND	0	0	7.29	BP	NM	2
7/23/2020	NM	NM	NM	0	18.36	ND	0	0	7.49	BP	NM	2.5
8/6/2020	NM	NM	NM	0	17.66	ND	0	0	5.64	BP	NM	1.3
8/20/2020	NM	NM	NM	0	18.02	ND	0	0	7.38	BP	NM	0.5
9/2/2020	NM	NM	NM	0	18.2	ND	0	0	8.11	BP	NM	0.8
9/17/2020	NM	NM	NM	0	18.56	ND	0	0	8.81	BP	NM	1
10/1/2020	NM	NM	NM	0	18.29	ND	0	0	6.39	BP	NM	0.8
10/14/2020	NM	NM	NM	0	18.31	ND	0	0	8.71	BP	NM	2
10/28/2020	NM	NM	NM	0	18.61	ND	0	0	8.51	BP	NM	1.5
11/12/2020	NM	NM	NM	0	18.71	ND	0	0	8.49	BP	NM	0.5
11/23/2020	NM	NM	NM	0	18.97	ND	0	0	8.84	BP	NM	0
12/10/2020	NM	NM	NM	0	18.62	ND	0	0	5.31	BP	NM	1.5
12/21/2020	NM	NM	NM	0	18.01	ND	0	0	4.42	BP	NM	1
1/7/2021	NM	NM	NM	0	17.52	ND	0	0	4.48	BP	NM	1.5
1/21/2021	NM	NM	NM	0	17.39	ND	0	0	4.59	BP	NM	2
2/4/2021	NM	NM	NM	0	17.22	ND	0	0	5.62	BP	NM	1.5
2/23/2021	NM	NM	NM	0	17.04	ND	0	0	4.58	BP	NM	1
3/11/2021	NM	NM	NM	0	16.98	ND	0	0	4.22	BP	NM	1.5
3/25/2021	NM	NM	NM	0	17.01	ND	0	0	5.13	BP	NM	1.0
4/8/2021	NM	NM	NM	0	17.22	ND	0	0	6.63	BP	NM	1.0
4/22/2021	NM	NM	NM	0	17.41	ND	0	0	7.64	BP	NM	1.0
5/4/2021	NM	NM	NM	0	17.57	ND	0	0	5.96	BP	NM	1.0
5/20/2021	NM	NM	NM	0	16.51	ND	0	0	5.62	BP	NM	1.0
6/3/2021	NM	NM	NM	0	15.81	ND	0	0	4.41	BP	NM	1.0
6/17/2021	NM	NM	NM	0	16.74	ND	0	0	5.81	BP	NM	1.0
7/1/2021	NM	NM	NM	0	15.71	ND	0	0	4.36	BP	NM	1.0
7/19/2021	NM	NM	NM	0	15.49	ND	0	0	4.11	BP	NM	1.0
7/29/2021	NM	NM	NM	0	15.98	ND	0	0	6.51	BP	NM	1.0
8/12/2021	NM	NM	NM	0	16.58	ND	0	0	8.01	BP	NM	1.0
8/26/2021	NM	NM	NM	0	17.11	ND	0	0	8.04	BP	NM	1.0
9/10/2021	NM	NM	NM	0	17.56	ND	0	0	8.25	BP	NM	0.3
9/22/2021	5.32	ND	0	0	17.32	ND	0	0	5.66	BP	NM	0
10/8/2021	1.53	ND	0	0	NM	NM	NM	0	1.34	43.68	1.13	0.0
10/20/2021	1.98	ND	0	0	17.68	ND	0	0	5.98	43.01	1.80	0.0
11/4/2021	3.56	ND	0	0	NM	NM	NM	0	5.08	42.00	2.81	0.3
11/18/2021	NM	NM	NM	0	NM	NM	NM	0	5.92	BP	NM	0.0
12/3/2021	3.7	ND	0	0	NM	NM	NM	0	6.57	BP	NM	0.0
12/16/2021	4.6	ND	0	0	17.6	ND	0	0	6.63	BP	NM	0.0
12/30/2021	4.29	ND	0	0	17.52	ND	0	0	5.21	BP	NM	0.0
1/14/2022	4.36	ND	0	0	17.58	ND	0	0	5.34	ND	Trace	0.0
1/26/2022	4.43	ND	0	0	17.66	ND	0	0	5.42	ND	Trace	0.0
2/10/2022	4.3	ND	0	0	17.3	ND	0	0	4.61	41.55	3.26	0.3
2/24/2022	4.25	ND	0	0	17.42	ND	0	0	5.6	41.55	3.26	0.2
3/10/2022	NM	NM	NM	0	17.48	ND	0	0	5.59	41.58	3.23	0.3
3/24/2022	5.08	ND	0	0	17.72	ND	0	0	5.06	BP	NM	TR
4/7/2022	4.80	ND	0	0	17.40	ND	0	0	5.80	BP	NM	0.1
4/18/2022	5.16	ND	0	0	17.86	ND	0	0	6.03	BP	NM	1.0
5/2/2022	5.40	ND	0	0	18.10	ND	0	0	6.24	BP	NM	1.0
5/20/2022	5.46	ND	0	0	18.02	ND	0	0	6.13	BP	NM	1.0
6/2/2022	5.61	ND	0	0	18.12	ND	0	0	6.29	BP	NM	1.0
6/16/2022	5.82	ND	0	0	18.21	ND	0	0	9.23	BP	NM	1.0
6/30/2022	5.87	ND	0	0	18.39	ND	0	0	9.37	BP	NM	0.3
Total DNAPL Pumped (gal)				0.0				0.0				271.9

Notes:

* - indicates DNAPL and groundwater mixture

ND - Not detected

** - indicates DTD from previous event was used

NM - Not measured

--- - No DNAPL pumped

PoP - Product on probe, not measureable

DTW - Depth to water (feet Below Top of Casing (BTOC))

TR - Trace amount of DNAPL Extracted

DTD - Depth to DNAPL (feet BTOC)

BP - Below pump; depth to DNAPL not measured because DNAPL is below top of in-well pump

TABLE 1

**SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS**

DNAPL Recovery Date	MW-44C				MW-45C				MW-46C			
	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)
2/14/2013	18.96	62.95	7.85	1	21.26	69.9	0.7	0.3	21.07	71.3	1.6	0.3
4/3/2013	19.34	70.47	0.33	0.3*	21.39	70.39	0.21	0.3*	20.61	72.36	0.54	0.3*
4/22/2013	18.62	70.64	0.16	0.3*	21.03	70.47	0.13	0.3*	20.61	72.61	0.29	0.3*
5/30/2013	18.43	70.01	0.79	0.3*	21.16	70.25	0.35	0.3*	20.59	71.61	1.29	0.3*
6/29/2013	19.34	70.32	0.48	0.3	21.93	70.32	0.28	0.3*	21.09	72.34	0.56	0.3*
7/22/2013	20.36	70.26	0.54	0.3	22.72	70.39	0.21	0.3*	21.96	72.16	0.74	0.3*
8/26/2013	20.62	70.39	0.41	0.3	22.86	70.31	0.29	0.3	22.23	72.32	0.58	0.3
9/27/2013	20.39	70.61	0.19	0.3	22.66	70.17	0.43	0.3	22.09	72.09	0.81	0.3
10/31/2013	20.17	70.75	0.05	0.1	22.59	70.42	0.18	0.1	22.41	72.34	0.56	0.2
11/27/2013	20.09	70.78	0.02	0.0	22.52	70.49	0.11	0	22.31	72.47	0.43	0.1
12/31/2013	20.01	70.8	PoP	0.0	22.39	70.46	0.14	0	22.03	72.53	0.37	0.1
1/30/2014	19.67	70.42	0.38	0.3	22.13	70.35	0.25	0	21.81	72.55	0.35	0.1
3/3/2014	19.29	70.17	0.63	0.3	21.86	70.09	0.51	0	21.57	72.05	0.85	0.3
3/31/2014	19.17	70.02	0.78	0.3	21.71	69.63	0.97	0.3	21.43	72.12	0.78	0.1
4/30/2014	19.02	69.81	0.99	0.3	21.59	69.74	0.86	0.3	21.27	71.81	1.09	0.3
5/27/2014	18.92	69.71	1.09	0.0	21.52	69.67	0.93	0.3	21.34	71.71	1.19	0.3
6/26/2014	18.81	69.52	1.28	0.3	21.59	69.77	0.83	0.3	21.17	71.6	1.3	0.3
7/31/2014	18.66	69.37	1.43	0.3	21.21	69.96	0.64	0.3	20.39	71.43	1.47	0.3
8/27/2014	18.53	69.47	1.33	0.3	21.13	70.12	0.48	0.3	20.22	71.61	1.29	0.3
10/3/2014	18.41	69.23	1.57	0.3	20.13	70.41	0.19	0.3	20.14	71.39	1.51	0.3
11/3/2014	18.52	69.37	1.43	0.3	20.29	70.36	0.24	0.3	20.27	71.47	1.43	0.3
11/24/2014	18.57	69.49	1.31	0.5	20.34	70.48	0.12	0.3	20.38	71.53	1.37	0.5
12/22/2014	18.51	69.31	1.49	0.5	20.31	70.41	0.19	0.3	20.37	71.42	1.48	0.5
1/29/2015	18.39	69.39	1.41	0.5	20.17	70.51	0.09	0.3	20.13	71.48	1.42	0.5
2/26/2015	18.42	69.51	1.29	0.5	20.11	70.59	0.01	0	20.09	71.38	1.52	0.5
3/26/2015	18.39	69.42	1.38	0.3	19.26	70.52	0.08	0	20.17	71.02	1.88	0.3
4/27/2015	18.29	69.52	1.28	0.5	20.17	70.48	0.12	0.3	20.22	71.56	1.34	1.0
5/26/2015	18.17	69.57	1.23	0.8	20.12	70.41	0.19	0.3	20.12	71.61	1.29	1.0
7/6/2015	16.29	69.86	0.94	0.5	18.07	70.49	0.11	0.3	18.17	71.93	0.97	0.8
8/3/2015	16.18	69.82	0.98	0.5	18.16	70.56	0.04	TR*	18.24	71.98	0.92	0.8
8/27/2015	17.46	69.74	1.06	0.3	19.03	70.54	0.06	TR*	19.39	72.03	0.87	0.5
10/5/2015	16.83	69.86	0.94	0.3	18.39	ND	0	0	18.72	72.34	0.56	0.5
11/5/2015	16.62	69.79	1.01	0.3	17.96	ND	0	0	18.51	72.26	0.64	0.5
12/3/2015	16.46	69.73	1.07	0.3	17.72	ND	0	0	18.62	72.36	0.54	0.5
12/28/2015	16.32	69.77	1.03	0.3	17.62	ND	0	0	18.42	72.31	0.59	0.5
2/3/2016	16.17	69.74	1.06	0.3	17.42	ND	0	0	18.29	72.46	0.44	0.3
3/3/2016	16.12	69.79	1.01	0.3	17.39	ND	0	0	18.23	72.49	0.41	0.3
3/31/2016	16.06	69.71	1.09	0.3	17.33	ND	0	0	18.24	72.54	0.36	0.3
5/3/2016	16.27	69.59	1.21	0.3	17.47	ND	0	0	18.39	72.39	0.51	0.3
6/2/2016	16.38	69.63	1.17	0.3	17.52	ND	0	0	18.43	72.43	0.47	0.3
7/8/2016	16.47	69.71	1.09	0.3	17.62	ND	0	0	18.54	72.49	0.41	0.3
8/3/2016	16.59	69.7	1.1	0.3	17.69	ND	0	0	18.51	72.53	0.37	0.3
8/30/2016	16.67	69.58	1.22	0.3	17.76	ND	0	0	18.72	72.57	0.33	0.3
9/30/2016	16.79	69.49	1.31	0.5	17.86	ND	0	0	18.83	72.46	0.44	0.3
11/3/2016	16.86	69.71	1.09	0.5	17.92	ND	0	0	18.89	72.41	0.49	0.3
11/30/2016	17.03	69.94	0.86	0.8	18.09	ND	0	0	19.12	72.32	0.58	0.3
1/4/2017	17.22	70.11	0.69	0.8	18.22	ND	0	0	19.27	72.46	0.44	0.3
2/7/2017	17.29	70.01	0.79	0.5	18.17	ND	0	0	19.19	72.39	0.51	0.3
3/2/2017	17.17	70.16	0.64	0.5	17.96	ND	0	0	19.03	72.31	0.59	0.3
4/3/2017	17.06	70.21	0.59	0	17.89	ND	0	0	18.97	72.39	0.51	0.3
4/27/2017	17.01	70.29	0.51	0	17.67	ND	0	0	18.84	72.31	0.59	0.5
5/29/2017	17.23	70.24	0.56	0.3	17.84	ND	0	0	18.94	72.47	0.43	0.3
7/5/2017	17.33	70.34	0.46	0.3	17.96	ND	0	0	19.12	72.34	0.56	0.5
8/1/2017	17.39	70.39	0.41	0.3	18.09	ND	0	0	19.23	72.27	0.63	0.5
9/5/2017	17.36	70.43	0.37	0.3	18.16	ND	0	0	19.29	72.34	0.56	0.5
10/4/2017	17.31	70.41	0.39	0.3	18.21	ND	0	0	19.36	72.3	0.6	0.5
11/2/2017	17.42	70.4	0.4	0.3	18.32	ND	0	0	19.42	72.36	0.54	0.5
11/29/2017	17.49	70.36	0.44	0.3	18.43	ND	0	0	19.57	72.34	0.56	0.5
1/2/2018	17.67	70.31	0.49	0.5	18.73	ND	0	0	19.81	72.39	0.51	0.5
2/7/2018	17.77	70.34	0.46	0.5	18.62	ND	0	0	19.96	72.46	0.44	0.5
3/1/2018	NM	NM	NM	0	18.79	ND	0	0	20.02	72.32	0.58	0.5
4/2/2018	NM	NM	NM	0	18.72	ND	0	0	19.81	72.39	0.51	0.5
5/1/2018	NM	NM	NM	0	19.31	ND	0	0	20.62	72.46	0.44	1
6/1/2018	18.31	70.17	0.63	0.8	19.47	ND	0	0	20.87	72.51	0.39	1
6/29/2018	18.79	70.39	0.41	0.8	19.67	ND	0	0	20.97	72.57	0.33	1
8/3/2018	18.97	70.36	0.44	0.8	19.77	ND	0	0	21.11	72.59	0.31	1
8/31/2018	18.87	70.39	0.41	0.5	19.41	ND	0	0	20.96	72.48	0.42	0.5
9/28/2018	18.82	70.41	0.39	0.8	19.32	ND	0	0	20.91	72.43	0.47	0.5
11/2/2018	18.67	70.44	0.36	0.8	19.26	ND	0	0	20.77	72.39	0.51	0.8
11/29/2018	18.47	70.46	0.34	0.3	19.16	ND	0	0	20.52	72.34	0.56	0.5
1/2/2019	18.42	70.41	0.39	0.5	19.02	ND	0	0	20.49	72.46	0.44	0.5
2/2/2019	18.29	70.41	0.39	0.5	18.93	ND	0	0	20.43	72.49	0.41	0.5
2/28/2019	18.16	70.42	0.38	0.5	18.77	ND	0	0	20.34	72.37	0.53	0.5
4/2/2019	18.09	70.39	0.41	0.5	18.71	ND	0	0	20.18	72.32	0.58	0.5
4/25/2019	18.02	70.16	0.64	0.5	18.63	ND	0	0	20.14	72.36	0.54	0.5
5/29/2019	18.61	70.23	0.57	0.5	18.47	ND	0	0	20.06	72.39	0.51	0.5
6/12/2019	18.29	ND	Trace	0	18.81	ND	0	0	18.02	ND	Trace	0
6/30/2019	18.16	ND	0	0	18.71	ND	0	0	18.09	ND	0	0
7/16/2019	18.09	ND	0	0	18.66	ND	0	0	18.12	ND	0	0
8/2/2019	18.17	ND	0	0	18.72	ND	0	0	18.17	ND	0	0
8/15/2019	18.22	ND	0	0	18.79	ND	0	0	18.09	ND	0	0
8/28/2019	18.29	ND	0	0	18.86	ND	0	0	18.17	ND	0	0
9/17/2019	18.39	ND	0	0	18.97	ND	0	0	18.23	ND	0	0
10/2/2019	18.32	ND	0	0	18.89	ND	0	0	18.17	ND	0	0

TABLE 1

**SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS**

DNAPL Recovery Date	MW-44C				MW-45C				MW-46C			
	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)
10/16/2019	15.06	ND**	0	0	16.23	ND	0	0	16.34	ND	0	0
10/31/2019	14.89	ND**	0	0	15.94	ND	0	0	16.06	ND	0	0
11/15/2019	14.21	ND**	0	0	15.69	ND	0	0	15.81	ND	0	0
12/3/2019	16.11	ND**	0	0	15.71	ND	0	0	15.91	ND	0	0
12/18/2019	16.51	ND**	0	0	15.91	ND	0	0	16.11	ND	0	0
12/30/2019	16.65	ND**	0	0	16.11	ND	0	0	16.22	ND	0	0
1/7/2020	--	--	--	--	--	--	--	--	--	--	--	--
1/15/2020	16.61	ND**	0	0	16.11	ND	0	0	16.29	ND	0	0
1/27/2020	16.24	ND**	0	0	15.71	ND	0	0	16.15	ND	0	0
2/13/2020	15.81	ND**	0	0	15.29	ND	0	0	14.4	ND	0	0
2/25/2020	15.81	ND**	0	0	15.28	ND	0	0	15.42	ND	0	0
3/13/2020	15.84	ND**	0	0	15.31	ND	0	0	15.57	ND	0	0
3/31/2020	14.82	ND**	0	0	15.59	ND	0	0	15.72	ND	0	0
4/9/2020	22.76	ND**	0	0	15.67	ND	0	0	15.89	ND	0	0
4/27/2020	14.67	ND**	0	0	15.94	ND	0	0	16.12	ND	0	0
5/14/2020	14.21	ND**	0	0	16.38	69.3	1.30	0.1	16.51	ND	0	0
5/28/2020	12.06	57.61	0.39**	0	16.46	70	0.6	0	16.71	ND	0	0
6/11/2020	11.61	ND**	0	0	16.68	ND	0	0	16.83	ND	0	0
6/25/2020	10.37	ND**	0	0	14.99	ND	0	0	15.12	ND	0	0
7/9/2020	11.51	ND**	0	0	16.28	ND	0	0	16.51	ND	0	0
7/23/2020	16.92	ND**	0	0	16.49	69.7	0.90	TR	16.49	ND	0	0
8/6/2020	16.75	ND**	0	0	16.19	ND	0	0	16.47	ND	0	0
8/20/2020	16.71	ND**	0	0	16.18	ND	0	0	16.35	ND	0	0
9/2/2020	16.84	ND**	0	0	16.21	ND	0	0	16.51	ND	0	0
9/17/2020	17.29	ND**	0	0	16.71	ND	0	0	16.85	ND	0	0
10/1/2020	16.84	ND**	0	0	16.61	ND	0	0	16.64	ND	0	0
10/14/2020	16.92	ND**	0	0	16.39	ND	0	0	16.58	ND	0	0
10/28/2020	17.11	ND**	0	0	16.58	70.6	Trace	TR	16.74	ND	0	0
11/12/2020	17.42	ND**	0	0	16.83	ND	0	0	17.04	ND	0	0
11/23/2020	17.69	ND**	0	0	17.12	ND	0	0	17.33	ND	0	0
12/10/2020	17.01	ND**	0	0	16.50	ND	0	0	16.71	ND	0	0
12/21/2020	16.69	ND**	0	0	16.02	69.04	1.56	0.3	16.22	ND	0	0
1/7/2021	15.91	ND**	0	0	15.59	ND	0	0	15.81	ND	0	0
1/21/2021	15.77	ND**	0	0	15.2	70.5	0.1	TR	15.44	ND	0	0
2/4/2021	15.69	ND**	0	0	15.19	70.55	0.05	TR	15.39	ND	0	0
2/23/2021	14.55	ND**	0	0	14.99	70.21	0.39	TR	15.24	ND	0	0
3/11/2021	15.49	ND**	0	0	14.98	ND	0	0	15.21	ND	0	0
3/25/2021	15.5	ND**	0	0	14.99	ND	0	0	15.18	ND	0	0
4/8/2021	15.59	ND**	0	0	15.19	ND	0	0	15.41	ND	0	0
4/22/2021	16.09	ND**	0	0	15.52	ND	0	0	15.77	ND	0	0
5/4/2021	Well Damaged			0	14.58	ND	0	0	14.74	ND	0	0
5/20/2021	Well Damaged			0	15.58	ND	0	0	15.75	ND	0	0
6/3/2021	Well Damaged			0	14.96	ND	0	0	15.21	ND	0	0
6/17/2021	Well Damaged			0	15.76	ND	0	0	15.08	ND	0	0
7/1/2021	Well Damaged			0	14.59	69.79	0.81	0.3	14.81	ND	0	0
7/19/2021	Well Damaged			0	14.05	69.42	1.18	0.3	14.26	ND	0	0
7/29/2021	Well Damaged			0	14.05	69.71	0.89	0.1	14.29	ND	0	0
8/12/2021	Well Damaged			0	14.68	70.36	0.24	TR	14.84	ND	0	0
8/26/2021	Well Damaged			0	15.21	ND	0	0	15.43	ND	0	0
9/10/2021	Well Damaged			0	15.63	ND	0	0	15.82	ND	0	0
9/22/2021	Well Damaged			0	15.71	ND	0	0	15.89	ND	0	0
10/8/2021	Well Damaged			0	15.47	ND	0	0	15.83	ND	0	0
10/20/2021	Well Damaged			0	15.88	ND	0	0	15.98	ND	0	0
11/4/2021	Well Damaged			0	15.31	68.61	1.99	0	15.51	ND	0	0
11/18/2021	Well Damaged			0	15.31	ND	0	0	15.51	ND	0	0
12/3/2021	Well Damaged			0	15.51	ND	0	0	15.72	ND	0	0
12/16/2021	Well Damaged			0	15.68	ND	0	0	16.02	ND	0	0
12/30/2021	Well Damaged			0	15.61	ND	Trace	0	15.62	ND	Trace	0
1/14/2022	Well Damaged			0	15.72	ND	Trace	0	15.81	ND	Trace	0
1/26/2022	Well Damaged			0	15.83	ND	Trace	0	15.96	ND	Trace	0
2/10/2022	Well Damaged			0	15.33	ND	0	0	15.56	ND	0	0
2/24/2022	Well Damaged			0	15.58	69.83	0.67	0	15.78	ND	0	0
3/10/2022	Well Damaged			0	15.58	69.71	0.79	0.3	15.83	ND	0	0
3/24/2022	Well Damaged			0	16.08	ND	0	0	16.20	ND	0	0
4/7/2022	Well Damaged			0	16.15	ND	0	0	16.34	ND	0	0.0
4/18/2022	Well Damaged			0	16.29	ND	0	0	16.59	ND	0	0.0
5/2/2022	Well Damaged			0	16.43	ND	0	0	16.61	ND	0	0.0
5/20/2022	Well Damaged			0	16.29	ND	0	0	16.52	ND	0	0.0
6/2/2022	Well Damaged			0	16.42	ND	0	0	16.74	ND	0	0.0
6/16/2022	Well Damaged			0	NM	NM	0	0	17.33	ND	0	0.0
6/30/2022	Well Damaged			0	NM	NM	0	0	17.72	ND	0	0.0
Total DNAPL Pumped (gal)				26.7				7.1				31.8

Notes:

* - indicates DNAPL and groundwater mixture

ND - Not detected

--- - No DNAPL pumped

NM - Not measured

DTW - Depth to water (feet Below Top of Casing (BTOC))

PoP - Product on probe, not measureable

DTD - Depth to DNAPL (feet BTOC)

TR- Trace amount of DNAPL Extracted

MW-44C not measured 3/1/18 - 5/1/18; couldn't locate well due to construction. MW-45C not measured 6/16/22-6/30/22; couldn't locate well

**Total depth measured in MW-44C was approximately 10 ft higher than during previous events - attempted to remove silt in July and October 2020.

TABLE 1

**SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS**

DNAPL Recovery Date	MW-49B				MW-57A				MW-57B			
	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)
2/14/2013					10.56	22.12	4.78	0.5	28.56	41.41	1.54	0.3
4/3/2013					10.32	24.79	2.11	0.5	28.09	42.36	0.59	0.3*
4/22/2013					10.71	25.85	1.05	0.5	27.06	42.17	0.78	0.3
5/30/2013					10.63	24.16	2.74	0.5	27.13	41.63	1.32	0.3
6/29/2013					12.16	23.82	3.08	2	18.26	42.07	0.88	0.3
7/22/2013	11.83	33.91	0.84	--	13.21	23.05	3.85	2	16.34	41.67	1.28	0.8
8/26/2013					12.91	25.32	1.58	1	18.01	42.31	0.64	0.3
9/27/2013					12.72	25.71	1.19	0.8	17.74	42.51	0.39	0.3
10/31/2013					12.72	25.92	0.98	1	17.61	42.61	0.29	0.1
11/27/2013					12.61	25.98	0.92	1	17.54	42.67	0.23	0.1
12/31/2013					12.46	26.09	0.81	1	17.36	42.74	0.16	0.1
1/30/2014					11.79	26.15	0.75	0.3	17.04	ND	Trace	0
3/3/2014					11.02	26.25	0.65	0.3	16.51	ND	Trace	0
3/31/2014					10.83	26.41	0.49	0.3	16.41	ND	Trace	0
4/30/2014					10.71	26.31	0.59	0.3	16.29	ND	Trace	0
5/27/2014					10.74	26.16	0.74	0.3	16.13	ND	Trace	0
6/26/2014					10.61	26.29	0.61	0.3	16.02	ND	Trace	0
7/31/2014					10.35	26.18	0.72	0.3	15.84	ND	Trace	0
8/27/2014					10.22	26.26	0.64	0.3	15.71	ND	Trace	0
10/3/2014					10.09	26.04	0.86	0.3	15.61	ND	Trace	0
11/3/2014					10.17	26.16	0.74	0.3	NM	NM	NM	0
11/24/2014					10.13	26.29	0.61	0.3	NM	NM	NM	0
12/22/2014					10.06	26.34	0.56	0.3	NM	NM	NM	0
1/29/2015					9.73	26.51	0.39	0.3	NM	NM	NM	0
2/26/2015					9.87	26.42	0.48	0.3	NM	NM	NM	0
3/26/2015					9.81	26.32	0.58	0.3	NM	NM	NM	0
4/27/2015					9.82	26.47	0.43	0.5	NM	NM	NM	0
5/26/2015					9.71	26.56	0.34	0.5	NM	NM	NM	0
7/6/2015					7.41	26.82	0.08	TR*	NM	NM	NM	0
8/3/2015					7.29	26.86	0.04	TR*	12.32	ND	PoP	0
8/27/2015					8.11	ND	0	TR*	13.04	ND	0	0
10/5/2015					7.72	ND	0	0	12.62	ND	0	0
11/5/2015					7.39	ND	0	0	12.27	ND	0	0
12/3/2015					7.13	ND	0	0	12.02	ND	0	0
12/28/2015					NM	NM	NM	0	NM	NM	NM	0
2/3/2016					NM	NM	NM	0	NM	NM	NM	0
3/3/2016					NM	NM	NM	0	NM	NM	NM	0
3/31/2016					NM	NM	NM	0	NM	NM	NM	0
5/3/2016					NM	NM	NM	0	NM	NM	NM	0
6/2/2016					7.26	ND	0	0	12.32	ND	0	0
7/8/2016					7.39	ND	0	0	12.44	ND	0	0
8/3/2016					7.46	ND	0	0	12.52	ND	0	0
8/30/2016					7.58	ND	0	0	12.67	ND	0	0
9/30/2016					7.69	ND	0	0	12.81	ND	0	0
11/3/2016					7.77	ND	0	0	12.92	ND	0	0
11/30/2016					7.92	ND	0	0	13.16	ND	0	0
1/4/2017					8.07	ND	0	0	13.24	ND	0	0
2/7/2017					8.18	ND	0	0	13.29	ND	0	0
3/2/2017					8.02	ND	0	0	13.17	ND	0	0
4/3/2017					8.06	ND	0	0	13.04	ND	0	0
4/27/2017					8.01	ND	0	0	13.14	ND	0	0
5/29/2017					8.34	ND	0	0	13.41	ND	0	0
7/5/2017					8.41	ND	0	0	13.57	ND	0	0
8/1/2017					8.52	ND	0	0	13.69	ND	0	0
9/5/2017					8.46	ND	0	0	13.79	ND	0	0
10/4/2017					8.41	ND	0	0	13.71	ND	0	0
11/2/2017					8.52	ND	0	0	13.91	ND	0	0
11/29/2017					8.67	ND	0	0	14.02	ND	0	0
1/2/2018					8.91	ND	0	0	13.06	ND	0	0
2/7/2018					8.98	ND	0	0	12.42	ND	0	0
3/1/2018					9.22	ND	0	0	12.58	ND	0	0
4/2/2018					9.16	ND	0	0	12.46	ND	0	0
5/1/2018					9.34	ND	0	0	13.04	ND	0	0
6/1/2018					9.67	ND	0	0	13.29	ND	0	0
6/29/2018					9.87	ND	0	0	13.47	ND	0	0
8/3/2018					10.02	ND	0	0	13.61	ND	0	0
8/31/2018					9.91	ND	0	0	13.47	ND	0	0
9/28/2018					9.86	ND	0	0	13.36	ND	0	0
11/2/2018					9.77	ND	0	0	13.21	ND	0	0
11/29/2018					9.56	ND	0	0	13.01	ND	0	0
1/2/2019					9.52	ND	Trace	0	13.03	ND	Trace	0
2/2/2019					9.41	ND	Trace	0	12.91	ND	Trace	0
2/28/2019					9.32	ND	Trace	0	12.83	ND	Trace	0
4/2/2019					9.27	ND	Trace	0	12.76	ND	Trace	0
4/25/2019					9.16	ND	Trace	0	12.71	ND	Trace	0
5/29/2019					9.06	ND	Trace	0	12.70	ND	Trace	0
6/12/2019					9.39	ND	0	0	12.93	ND	0	0
6/30/2019					9.21	ND	0	0	12.86	ND	0	0
7/16/2019	12.02	34.62	0.24	--	9.17	ND	0	0	12.79	ND	0	0
8/2/2019					9.22	ND	0	0	12.84	ND	0	0
8/15/2019					9.29	ND	0	0	12.92	ND	0	0
8/28/2019					9.33	ND	0	0	12.96	ND	0	0
9/17/2019					9.46	ND	0	0	12.86	ND	0	0
10/2/2019					9.74	ND	0	0	12.83	ND	0	0

TABLE 1

**SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS**

DNAPL Recovery Date	MW-49B				MW-57A				MW-57B			
	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)
10/16/2019					10.39	ND	0	0	13.67	ND	0	0
10/31/2019					11.92	ND	0	0	14.21	ND	0	0
11/15/2019					11.14	ND	0	0	6.21	ND	0	0
12/3/2019					13.75	ND	0	0	13.51	ND	0	0
12/18/2019					14.09	ND	0	0	13.51	ND	0	0
12/30/2019					14.42	ND	0	0	13.51	ND	0	0
1/7/2020	11.51	20.09	14.77	--	--	--	--	--	--	--	--	--
1/15/2020	15.48	20.89	13.97	2.5	12.79	ND	0	0	21.93	ND	0	0
1/27/2020	14.2	22.4	12.46	2	11.61	ND	0	0	19.96	ND	0	0
2/13/2020	13.31	28.9	5.96	1.5	13.22	ND	0	0	17.91	ND	0	0
2/25/2020	11.51	26.8	8.06	1.0	12.31	ND	0	0	16.86	ND	0	0
3/13/2020	11.73	26.1	8.76	0.5	13.71	ND	0	0	15.91	ND	0	0
3/31/2020	13.72	29.39	5.47	0.5	13.85	ND	0	0	15.37	ND	0	0
4/9/2020	14.13	31.04	3.82	0.5	13.36	ND	0	0	15.19	ND	0	0
4/27/2020	15.31	32.05	2.81	0.1	14.45	ND	0	0	14.99	ND	0	0
5/14/2020	14.95	31.89	2.97	0.1	14.84	ND	0	0	14.95	ND	0	0
5/28/2020	13.66	31.07	3.79	0.5	13.91	ND	0	0	14.92	ND	0	0
6/11/2020	14.56	31.22	3.64	0.3	14.41	ND	0	0	14.89	ND	0	0
6/25/2020	10.65	31.64	3.22	0.3	14.08	ND	0	0	14.28	ND	0	0
7/9/2020	10.51	32.41	2.45	0.5	13.51	ND	0	0	14.67	ND	0	0
7/23/2020	13.51	31.13	3.73	0.5	13.26	ND	0	0	17.09	ND	0	0
8/6/2020	13.23	32.48	2.38	0.3	11.53	ND	0	0	16.20	ND	0	0
8/20/2020	12.11	32.08	2.78	0.1	13.11	ND	0	0	15.47	ND	0	0
9/2/2020	13.58	31.04	3.82	0.8	13.91	ND	0	0	15.01	ND	0	0
9/17/2020	15.91	30.24	4.62	0.5	14.43	ND	0	0	14.71	ND	0	0
10/1/2020	13.63	31.11	3.75	0.8	12.41	ND	0	0	14.44	ND	0	0
10/14/2020	12.18	29.6	5.26	2.0	13.74	ND	0	0	14.08	ND	0	0
10/28/2020	13.71	31.93	2.93	1.0	13.91	ND	0	0	13.87	ND	0	0
11/12/2020	12.74	32.03	2.83	0.5	14.64	ND	0	0	13.81	ND	0	0
11/23/2020	12.08	32.30	2.56	0.3	14.99	ND	0	0	13.21	ND	0	0
12/10/2020	8.66	31.21	3.65	0.3	12.31	ND	0	0	13.76	ND	0	0
12/21/2020	6.6	30.72	4.14	0.5	10.92	ND	0	0	13.56	ND	0	0
1/7/2021	6.41	32.25	2.61	0.5	12.51	ND	0	0	13.25	ND	0	0
1/21/2021	15.44	31.25	3.61	0.5	12.54	ND	0	0	20.69	ND	0	0
2/4/2021	15.81	31.54	3.32	0.5	13.15	ND	0	0	18.46	ND	0	0
2/23/2021	13.44	31.2	3.66	0.5	12.32	ND	0	0	16.49	ND	0	0
3/11/2021	11.91	31.96	2.9	0.5	13.13	ND	0	0	15.55	ND	0	0
3/25/2021	10.28	32.41	2.45	0.5	13.01	ND	0	0	15.06	ND	0	0
4/8/2021	10.79	31.79	3.07	0.5	13.71	ND	0	0	14.84	ND	0	0
4/22/2021	11.29	32.08	2.78	0.5	14.31	ND	0	0	14.65	ND	0	0
5/4/2021	7.94	32.4	2.46	0.3	13.03	ND	0	0	14.59	ND	0	0
5/20/2021	7.04	32.69	2.17	0.5	10.45	ND	0	0	14.61	ND	0	0
6/3/2021	4.81	32.6	2.26	0.5	11.15	ND	0	0	14.12	ND	0	0
6/17/2021	6.39	32.8	2.06	TR	12.21	ND	0	0	13.84	ND	0	0
7/1/2021	4.51	ND	0	0	10.38	ND	0	0	13.61	ND	0	0
7/19/2021	0.39	ND	0	0	9.79	ND	0	0	13.22	ND	0	0
7/29/2021	12.91	ND	0	0	12.51	ND	0	0	16.66	ND	0	0
8/12/2021	10.49	32.60	2.26	0.1	13.91	ND	0	0	15.32	ND	0	0
8/26/2021	9.87	31.90	2.96	0.5	14.11	ND	0	0	14.92	ND	0	0
9/10/2021	10.03	31.79	3.07	0.2	14.28	ND	0	0	14.61	ND	0	0
9/22/2021	7.50	ND	0	0	13.21	ND	0	0	14.40	ND	0	0
10/8/2021	7.56	ND	0	0	12.05	ND	0	0	14.10	ND	0	0
10/20/2021	7.8	30.94	1.82	0.1	13.80	ND	0	0	14.61	ND	0	0
11/4/2021	7.63	ND	0	0	12.45	ND	0	0	13.59	ND	0	0
11/18/2021	8.00	ND	0	0	13.37	ND	0	0	13.44	ND	0	0
12/3/2021	8.25	ND	0	0	13.81	ND	0	0	13.40	ND	0	0
12/16/2021	8.52	ND	0	0	13.69	ND	0	0	13.36	ND	0	0
12/30/2021	7.81	ND	0	0	13.36	ND	0	0	13.41	ND	Trace	0
1/14/2022	7.92	ND	0	0	13.43	ND	0	0	13.52	ND	Trace	0
1/26/2022	7.91	ND	0	0	13.56	ND	0	0	13.44	ND	Trace	0
2/10/2022	11.38	30	2.76	0.3	12.71	ND	0	0	19.21	ND	0	0
2/24/2022	12.6	ND	0	0	13.68	ND	0	0	17.65	ND	0	0
3/10/2022	11.96	ND	0	0	14.40	ND	0	0	18.44	ND	0	0
3/24/2022	12.20	ND	0	0	12.56	ND	0	0	16.06	ND	0	0
4/7/2022	11.60	ND	0	0	13.70	ND	0	0	15.60	ND	0	0
4/18/2022	11.32	ND	0	0	13.81	ND	0	0	15.39	ND	0	0
5/2/2022	11.08	ND	0	0	13.99	ND	0	0	15.17	ND	0	0
5/20/2022	11.17	ND	0	0	13.46	ND	0	0	15.41	ND	0	0
6/2/2022	11.12	ND	0	0	13.34	ND	0	0	15.34	ND	0	0
6/16/2022	10.97	ND	0	0	15.03	ND	0	0	14.95	ND	Trace	0
6/30/2022	11.16	ND	0	0	15.48	ND	0	0	15.03	ND	Trace	0
Total DNAPL Pumped (gal)				23.9				15.5				2.8

Notes:

* - indicates DNAPL and groundwater mixture

--- - No DNAPL pumped

DTW - Depth to water (feet Below Top of Casing (BTOC))

DTD - Depth to DNAPL (feet BTOC)

ND - Not detected

NM - Not measured

PoP - Product on probe, not measureable

TR- Trace amount of DNAPL Extracted

TABLE 1

**SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS**

DNAPL Recovery Date	MW-68B				MW-70B				MW-74B			
	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)
2/14/2013					6.57	34.09	1.61	0.3				
4/3/2013					6.79	35.26	0.44	0.3				
4/22/2013					6.06	35.12	0.58	0.3				
5/30/2013					6.19	34.67	1.03	0.3				
6/29/2013					8.01	34.92	0.78	0.3*				
7/22/2013					8.22	34.07	1.63	0.3*				
8/26/2013					8.17	35.09	0.61	0.3				
9/27/2013					8.32	35.34	0.36	0.3				
10/31/2013					8.26	35.39	0.31	0.1				
11/27/2013					8.12	35.42	0.28	0.1				
12/31/2013					7.89	35.51	0.19	0.1				
1/30/2014					7.84	35.06	0.64	0.1				
3/3/2014					7.09	35.05	0.65	0.1				
3/31/2014					6.87	35.17	0.53	0.1				
4/30/2014					6.72	35.01	0.69	0.1				
5/27/2014					6.64	34.86	0.84	0.1				
6/26/2014					6.52	34.97	0.73	0.3				
7/31/2014					6.26	34.76	0.94	0.3				
8/27/2014					6.84	34.86	0.84	0.3				
10/3/2014					6.71	34.61	1.09	0.3				
11/3/2014					6.79	34.79	0.91	0.3				
11/24/2014					6.77	34.93	0.77	0.3				
12/22/2014					6.69	34.86	0.84	0.3				
1/29/2015					6.48	34.92	0.78	0.3				
2/26/2015					6.39	34.81	0.89	0.5				
3/26/2015					6.27	34.91	0.79	0.3				
4/27/2015					6.19	34.99	0.71	0.3				
5/26/2015					6.07	35.11	0.59	0.5				
7/6/2015					5.03	35.32	0.38	0.3				
8/3/2015					5.12	35.37	0.33	TR*				
8/27/2015					6.31	35.41	0.29	TR*				
10/5/2015					5.72	35.47	0.23	0.3				
11/5/2015					5.41	35.42	0.28	0.3				
12/3/2015					5.13	35.63	0.07	0.3				
12/28/2015					5.02	35.26	0.44	0.3				
2/3/2016					4.86	35.21	0.49	0.3				
3/3/2016					4.92	35.17	0.53	0.3				
3/31/2016					4.91	35.24	0.46	0.3				
5/3/2016					5.13	35.29	0.36	0.3				
6/2/2016					5.26	35.36	0.29	0.3				
7/8/2016					5.34	35.31	0.34	0.3				
8/3/2016					5.42	35.39	0.26	0.3				
8/30/2016					5.61	35.21	0.44	0.3				
9/30/2016					5.74	35.03	0.62	0.3				
11/3/2016					5.79	35.11	0.54	0.3				
11/30/2016					6.03	35.23	0.42	0.3				
1/4/2017					6.17	35.09	0.56	0.5				
2/7/2017					6.26	35.01	0.64	0.5				
3/2/2017					6.16	35.09	0.56	0.5				
4/3/2017					6.09	35.13	0.52	0.5				
4/27/2017					6.12	35.2	0.45	0.5				
5/29/2017					6.29	35.06	0.59	0.5				
7/5/2017					6.39	35.14	0.51	0.3				
8/1/2017					6.47	35.21	0.44	0.3				
9/5/2017					6.56	35.34	0.31	0.3				
10/4/2017					6.63	35.39	0.26	0.3				
11/2/2017					6.74	35.31	0.34	0.3				
11/29/2017					6.79	35.29	0.36	0.3				
1/2/2018					6.34	35.34	0.31	0.3				
2/7/2018					6.42	35.31	0.34	0.3				
3/1/2018					6.67	35.21	0.44	0.5				
4/2/2018					6.61	35.16	0.49	0.5				
5/1/2018					7.22	35.23	0.42	1.3				
6/1/2018					7.42	35.29	0.36	1				
6/29/2018					7.58	35.21	0.44	1				
8/3/2018					7.69	35.29	0.36	0.8				
8/31/2018					7.42	35.36	0.29	0.5				
9/28/2018					7.33	35.28	0.37	0.5				
11/2/2018					7.22	35.24	0.41	0.8				
11/29/2018					7.06	35.21	0.44	0.5				
1/2/2019					6.96	35.31	0.34	0.5				
2/2/2019					6.87	35.36	0.29	0.5				
2/28/2019					6.74	35.29	0.36	0.5				
4/2/2019					6.67	35.27	0.38	0.5				
4/25/2019					6.74	35.21	0.44	0.5				
5/29/2019					6.71	35.17	0.48	0.5				
6/12/2019					6.43	34.84	0.81	1				
6/30/2019					6.48	34.61	1.04	1				
7/16/2019					6.43	34.49	1.16	1.5				
8/2/2019					6.48	34.31	1.34	1.5				
8/15/2019					6.51	34.07	1.58	2				
8/28/2019					6.57	34.09	1.56	2				
9/17/2019					6.51	34.01	1.64	2				
10/2/2019					6.46	33.71	1.94	2.5				

TABLE 1

**SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS**

DNAPL Recovery Date	MW-68B				MW-70B				MW-74B			
	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)
10/16/2019					6.42	ND	0	0				
10/31/2019					6.43	ND	Trace	0				
11/15/2019					4.75	ND	0	0				
12/3/2019					5.01	ND	0	0				
12/18/2019					5.53	35	0.65	0.3				
12/30/2019					5.71	32.4	3.25	0.1				
1/7/2020	4.82	34.21	3.59	--	--	--	--	--				
1/15/2020	4.82	34.41	3.39	0.5	7.19	32.51	3.14	0.1				
1/27/2020	2.15	35.9	1.9	0.5	9.9	31.3	4.35	0.1				
2/13/2020	3.49	35.02	2.78	0.5	5.99	31.43	4.22	0.1				
2/25/2020	2.35	36.12	1.68	0.3	4.71	31.81	3.84	0.3				
3/13/2020	3.99	35.6	2.2	0.1	4.63	30.5	5.15	0.3				
3/31/2020	4.46	36.9	0.9	0.0	6.04	31.34	4.31	0.5				
4/9/2020	4.41	35.99	1.81	0.1	6.79	31.53	4.12	0.5				
4/27/2020	5.53	36.1	1.7	0.1	6.81	30.84	4.81	1.0				
5/14/2020	6.39	37.01	0.79	0	7.26	30.63	5.02	1.0				
5/28/2020	5.99	37.09	0.71	TR	7.02	30.74	4.91	1.5				
6/11/2020	6.49	36.8	1	TR	7.53	31.2	4.45	0.5				
6/25/2020	6.09	36.94	0.86	TR	7.08	32.12	3.53	0.5				
7/9/2020	5.06	37.37	0.43	0.3	5.61	32	3.65	0.5				
7/23/2020	5.31	37.47	0.33	TR	6.33	32.2	3.45	1.0				
8/6/2020	3.02	37.38	0.42	TR	6.15	33.12	2.53	1.3				
8/20/2020	5.11	37.26	0.54	TR	5.74	33.2	2.45	1.0				
9/2/2020	5.96	37.4	0.4	TR	6.74	34.39	1.26	0.1				
9/17/2020	6.6	37.32	0.48	0.1	6.92	34.99	0.66	0.1				
10/1/2020	3.81	37.39	0.41	0.1	5.52	34.88	0.77	0.3				
10/14/2020	5.11	36.81	0.99	0.3	5.63	34.49	1.16	0.3				
10/28/2020	5.26	36.52	1.28	0.3	4.8	34.71	0.94	0.3				
11/12/2020	6.13	36.82	0.98	0.3	6.38	34.21	1.44	0.5				
11/23/2020	6.54	37.2	0.6	0.3	7.51	35.19	0.46	0.3				
12/10/2020	3.24	37.08	0.72	0.0	5.82	35.10	0.55	0.1				
12/21/2020	1.22	37.01	0.79	0.1	5.55	34.48	1.17	0.1				
1/7/2021	2.48	ND	0	0	5.04	35	0.65	TR				
1/21/2021	2.99	37.37	0.43	TR	4.72	35.02	0.63	TR				
2/4/2021	3.62	37.32	0.48	TR	7.2	35.08	0.57	TR				
2/23/2021	2.51	ND	0	0	5.33	34.2	1.45	1.0				
3/11/2021	3.49	ND	0	0	5.33	34.3	1.35	0.8				
3/25/2021	3.34	ND	0	0	5.78	34.93	0.72	0.5				
4/8/2021	4.28	ND	0	0	5.88	34.83	0.82	0.5				
4/22/2021	4.96	ND	0	0	5.99	34.56	1.09	0.5				
5/4/2021	3.64	37.38	0.42	0	6.21	34.39	1.26	0.5	7.81	32.80	2.20	2.0
5/20/2021	0.99	ND	0	0	5.89	35.09	0.56	0.3	5.93	33.40	1.60	0.5
6/3/2021	2.66	ND	0	0	4.58	34.98	0.67	0.3	6.54	33.62	1.38	0.5
6/17/2021	3.51	ND	0	0	4.78	35.16	0.49	0.3	6.86	34.70	0.30	0.1
7/1/2021	1.11	37.01	0.39	0.1	4.48	34.85	0.8	TR	3.68	34.08	0.92	0.5
7/19/2021	1.06	37.21	0.19	TR	3.78	34.9	0.75	TR	5.36	34.15	0.85	0.8
7/29/2021	3.74	37.38	0.02	TR	5.74	35.2	0.45	TR	6.31	33.60	1.40	1.0
8/12/2021	5.21	ND	0	0	5.71	35.12	0.53	TR	7.51	33.34	1.66	1.0
8/26/2021	5.80	ND	0	TR	5.88	35.16	0.49	TR	7.34	33.22	1.78	1.0
9/10/2021	5.08	ND	0	0	6.41	35.18	0.47	0.1	7.81	34.40	0.60	0.2
9/22/2021	4.65	ND	0	0	6.46	ND	0	0	11.35	34.41	0.59	0
10/8/2021	3.14	ND	0	0	5.12	ND	0	0	6.94	33.58	1.42	0
10/20/2021	5.01	ND	0	0	6.84	35.27	0.38	0	11.84	34.81	0.19	0
11/4/2021	3.38	ND	0	0	5.10	ND	0	0	7.24	33.83	1.17	0.3
11/18/2021	4.38	ND	0	0	5.34	ND	0	0	7.41	ND	0	0
12/3/2021	4.38	ND	0	0	5.58	ND	0	0	7.90	ND	0	0
12/16/2021	4.72	ND	0	0	5.84	ND	0	0	7.51	ND	0	0
12/30/2021	3.88	ND	0	0	5.46	ND	Trace	0	7.76	ND	Trace	0
1/14/2022	3.92	ND	0	0	5.56	ND	Trace	0	7.82	ND	Trace	0
1/26/2022	4.06	ND	0	0	5.67	ND	Trace	0	7.91	ND	Trace	0
2/10/2022	3.07	ND	0	0	5.39	ND	0	0	7.30	ND	0	0
2/24/2022	4.08	ND	0	0	5.52	34.7	0.6	0.2	8.41	ND	0	0
3/10/2022	4.99	ND	0	0	6.23	ND	0	0	8.60	ND	0	0
3/24/2022	2.91	ND	0	0	6.24	ND	0	0	8.62	ND	0	0
4/7/2022	4.23	ND	0	0	6.05	ND	0	0	8.20	ND	0	0
4/18/2022	4.46	ND	0	0	6.29	ND	0	0	8.42	ND	0	0
5/2/2022	5.13	ND	0	0	6.40	ND	Trace	0	8.52	ND	0	0
5/20/2022	5.21	ND	0	0	6.52	ND	0	0	8.51	ND	0	0
6/2/2022	5.39	ND	0	0	6.43	ND	0	0	8.39	ND	0	0
6/16/2022	5.27	ND	0	0	8.80	ND	0	0	9.09	ND	Trace	0
6/30/2022	5.35	ND	0	0	8.96	ND	0	0	9.47	ND	Trace	0
Total DNAPL Pumped (gal)				3.8				56.2				7.8

* - indicates DNAPL and groundwater mixture

ND - Not detected

--- - No DNAPL pumped

NM - Not measured

DTW - Depth to water (feet Below Top of Casing (BTOC))

PoP - Product on probe, not measurable

DTD - Depth to DNAPL (feet BTOC)

TR- Trace amount of DNAPL Extracted

TABLE 1

**SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS**

DNAPL Recovery Date	MW-75B				MW-78A				Approx DNAPL Recovered (gal)
	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	
2/14/2013	10.01	34.1	3.1	0.3	NM	NM	NM	0	9.8
4/3/2013	13.71	36.47	0.73	0.3	NM	NM	NM	0	5.2
4/22/2013	9.72	36.72	0.48	0.3	NM	NM	NM	0	2.9
5/30/2013	9.61	35.09	2.11	0.8	NM	NM	NM	0	7.7
6/29/2013	10.61	35.61	1.59	0.8	NM	NM	NM	0	7.2
7/22/2013	9.74	35.71	1.49	0.8	NM	NM	NM	0	6.7
8/26/2013	10.76	35.93	1.27	0.8	NM	NM	NM	0	6.5
9/27/2013	10.52	36.39	0.81	0.5	NM	NM	NM	0	5.8
10/31/2013	10.31	36.47	0.73	1	NM	NM	NM	0	5.1
11/27/2013	10.39	36.51	0.69	1	NM	NM	NM	0	4.7
12/31/2013	10.13	36.72	0.48	1	NM	NM	NM	0	4.7
1/30/2014	12.62	36.49	0.71	0.8	NM	NM	NM	0	4.7
3/3/2014	12.12	36.35	0.85	0.8	NM	NM	NM	0	4.9
3/31/2014	12.01	36.27	0.93	0.8	NM	NM	NM	0	5.0
4/30/2014	11.84	36.02	1.18	0.8	NM	NM	NM	0	5.1
5/27/2014	11.71	35.79	1.41	0.8	NM	NM	NM	0	4.9
6/26/2014	11.58	35.91	1.29	0.5	NM	NM	NM	0	5.0
7/31/2014	11.32	35.82	1.38	0.5	NM	NM	NM	0	4.8
8/27/2014	11.19	36.09	1.11	0.5	NM	NM	NM	0	4.3
10/3/2014	11.09	36.01	1.19	0.5	NM	NM	NM	0	4.8
11/3/2014	11.16	36.19	1.01	0.8	9.31	19.12	6.23	2	7.3
11/24/2014	11.21	36.27	0.93	0.5	9.39	19.62	5.73	2	8.0
12/22/2014	11.26	36.19	1.01	0.5	9.34	19.86	5.49	2	8.3
1/29/2015	11.06	36.34	0.86	0.5	9.14	21.29	4.06	2	7.8
2/26/2015	11.09	36.34	0.86	0.5	9.17	19.97	5.38	2.5	10.0
3/26/2015	10.93	36.42	0.78	0.5	9.12	20.31	5.04	0.8	7.3
4/27/2015	10.78	36.52	0.68	0.5	9.17	20.46	4.89	2	10.5
5/26/2015	10.61	36.72	0.48	0.8	9.09	20.59	4.76	2.5	12.3
7/6/2015	8.52	36.91	0.29	0.8	7.01	21.16	4.19	2	10.5
8/3/2015	8.66	36.96	0.24	0.8	7.12	21.39	3.96	2.5	10.8
8/27/2015	9.31	36.91	0.29	0.8	7.96	21.51	3.84	2	8.3
10/5/2015	8.62	37.02	0.18	0.5	7.23	21.67	3.68	2	8.0
11/5/2015	8.34	36.93	0.27	0.5	7.02	21.56	3.79	2	8.0
12/3/2015	8.12	36.81	0.39	0.5	6.83	21.67	3.68	2	8.0
12/28/2015	8.01	36.72	0.48	0.5	6.71	21.52	3.83	2.3	9.0
2/3/2016	7.82	36.19	1.01	0.3	6.52	21.67	3.68	2	9.0
3/3/2016	7.74	36.27	0.93	0.5	6.46	21.72	3.63	2	9.3
3/31/2016	7.67	36.39	0.81	0.5	6.49	21.86	3.49	2	9.3
5/3/2016	7.79	36.47	0.68	0.5	6.57	21.94	3.41	2	7.8
6/2/2016	7.71	36.42	0.73	0.5	6.65	21.91	3.44	2	8.3
7/8/2016	7.8	36.53	0.62	0.5	6.71	21.97	3.38	2	8.0
8/3/2016	7.89	36.59	0.56	0.5	6.82	22.04	3.31	2	8.0
8/30/2016	7.96	36.64	0.51	0.5	6.94	22.21	3.14	2	8.3
9/30/2016	7.91	36.51	0.64	0.5	7.04	22.39	2.96	2	8.5
11/3/2016	7.86	36.36	0.79	0.5	7.11	22.49	2.86	2	8.5
11/30/2016	7.97	36.47	0.68	0.8	7.29	22.67	2.68	2	8.8
1/4/2017	8.04	36.36	0.79	0.8	7.42	22.74	2.61	2	8.8
2/7/2017	8.12	36.21	0.94	0.8	7.48	22.93	2.42	2.5	9.0
3/2/2017	8.01	36.26	0.89	0.8	7.36	23.26	2.09	2	8.5
4/3/2017	7.93	36.43	0.72	0.8	7.29	23.34	2.01	2	7.5
4/27/2017	7.86	36.52	0.63	0.8	7.36	23.42	1.93	2	8.0
5/29/2017	7.94	36.41	0.74	0.8	7.51	23.51	1.84	2	7.8
7/5/2017	8.04	36.36	0.79	0.8	7.79	23.59	1.76	2	7.3
8/1/2017	8.16	36.31	0.84	0.8	7.89	23.51	1.84	2	8.0
9/5/2017	8.22	36.47	0.68	0.8	7.81	23.48	1.87	2	8.3
10/4/2017	8.29	36.56	0.59	0.8	7.89	23.51	1.84	2	7.8
11/2/2017	8.37	36.51	0.64	1	7.97	23.59	1.76	2	8.5
11/29/2017	8.33	36.59	0.56	1	8.02	23.67	1.68	2	8.0
1/2/2018	8.07	36.72	0.43	1	8.17	23.82	1.53	2	8.3
2/7/2018	8.17	36.91	0.24	1	8.29	23.97	1.38	2	8.3
3/1/2018	8.31	36.94	0.21	1	8.47	23.91	1.44	2	7.5
4/2/2018	8.26	36.89	0.26	0.8	8.39	23.97	1.38	2.3	7.8
5/1/2018	8.92	36.96	0.19	0.8	9.02	24.06	1.29	2	9.0
6/1/2018	9.34	36.91	0.24	0.8	9.21	24.13	1.22	2	9.8
6/29/2018	9.67	36.82	0.33	0.8	9.39	24.21	1.14	2.3	10.5
8/3/2018	9.84	36.87	0.28	0.8	9.47	24.31	1.04	2	10.0
8/31/2018	9.71	36.91	0.24	0.8	9.32	24.47	0.88	2	8.3
9/28/2018	9.62	36.84	0.31	0.8	9.22	24.39	0.96	2	8.3
11/2/2018	9.57	36.88	0.27	0.8	9.09	24.27	1.08	2	8.5
11/29/2018	9.41	36.92	0.23	1	8.96	24.22	1.13	2	7.5
1/2/2019	9.28	36.96	0.19	1	8.78	24.39	0.96	2	7.8
2/2/2019	9.22	36.91	0.24	1	8.71	24.47	0.88	2	8.0
2/28/2019	9.16	36.93	0.22	1	8.67	24.42	0.93	2	8.8
4/2/2019	9.06	36.91	0.24	1	8.58	24.43	0.92	2	8.8
4/25/2019	9.02	36.72	0.43	1	8.49	24.31	1.04	2	9.3
5/29/2019	9.07	36.67	0.48	1	8.42	24.26	1.09	2	9.3
6/12/2019	8.92	ND	Trace	0	8.67	23.96	1.39	2	9.0
6/30/2019	8.66	ND	Trace	0	9.36	23.77	1.58	2	9.8
7/16/2019	8.62	ND	Trace	0	9.29	23.62	1.73	2	10.5
8/2/2019	8.67	ND	Trace	0	9.34	23.57	1.78	2	8.0
8/15/2019	8.69	ND	ND	0	9.42	23.06	2.29	2	12.0
8/28/2019	8.72	ND	Trace	0	9.51	23.01	2.34	2	12.0
9/17/2019	8.61	ND	Trace	0	9.39	22.76	2.59	2	13.0
10/2/2019	8.53	ND	Trace	0	9.27	22.58	2.77	2	10.5

TABLE 1

**SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS**

DNAPL Recovery Date	MW-75B				MW-78A				Approx DNAPL Recovered (gal)
	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	
10/16/2019	NM	NM	NM	0	10.16	21.63	3.72	2	8.0
10/31/2019	NM	NM	NM	0	10.41	21.79	3.56	2.5	8.5
11/15/2019	7.91	ND	0	0	8.01	21.62	3.73	1.5	5.0
12/3/2019	8.24	ND	0	0	8.41	22.12	3.23	2	6.5
12/18/2019	4.99	ND	0	0	8.38	ND	0	0	2.1
12/30/2019	7.79	35.3	1.85	0	9.16	19.93	5.42	1.5	3.3
1/7/2020	--	--	--	--	--	--	--	--	--
1/15/2020	6.47	36.4	0.75	0	8.79	24.9	0.45	0.1	4.1
1/27/2020	5.92	34.6	2.55	0.1	7.06	24.06	1.29	0	3.8
2/13/2020	7.88	35.08	2.07	0.1	8.01	24.08	1.27	0	3.3
2/25/2020	5.82	ND	0	0	7.84	21.86	3.49	0.3	2.6
3/13/2020	8.24	34.9	2.25	0.1	NM	NM	NM	0	2.3
3/31/2020	4.79	ND	0	0	7.82	23.1	2.25	0.1	5.9
4/9/2020	8.52	ND	0	0	7.52	22.5	2.85	0.1	7.3
4/27/2020	9.07	ND	0	0	8.33	23.2	2.15	0.5	7.7
5/14/2020	7.74	37.1	0.05	0	8.05	23.22	2.13	0.5	8.3
5/28/2020	5.06	ND	0	0	7.59	23.69	1.66	0.5	8.6
6/11/2020	5.79	37	0.15	TR	7.39	24.96	0.39	0.1	5.6
6/25/2020	4.87	ND	0	0	6.28	19.9	5.45	1.5	6.5
7/9/2020	8.91	ND	0	0	8.41	19.7	5.65	2.5	7.3
7/23/2020	8.71	ND	0	0	7.85	20.91	4.44	1.0	8.8
8/6/2020	6.74	ND	0	0	7.81	22.05	3.3	1.0	6.3
8/20/2020	6.01	ND	0	0	7.21	21.88	3.47	0.5	3.9
9/2/2020	8.61	ND	0	0	6.98	22.6	2.75	1.0	4.4
9/17/2020	8.52	ND	0	0	8.05	22.21	3.14	0.5	3.1
10/1/2020	7.33	37.1	Trace	0	8.01	24.1	1.25	1.0	3.9
10/14/2020	8.26	37.2	Trace	TR	8.11	24.9	0.45	0.5	8.3
10/28/2020	8.11	ND	0	0	7.99	25.08	0.27	0.3	6.3
11/12/2020	8.41	36.78	0.37	0.3	8.42	25.0	0.35	0.1	5.6
11/23/2020	8.62	36.04	1.11	0.3	9.19	25.08	0.27	0.3	3.3
12/10/2020	7.94	36.54	0.61	0.1	8.79	25.12	0.23	TR	4.8
12/21/2020	6.15	36.84	0.31	0.1	6.43	25.21	0.14	TR	3.9
1/7/2021	6.81	37.01	0.14	0.1	7.31	ND	0	0	4.1
1/21/2021	7.85	35.5	1.65	2.0	7.71	ND	0	0	7.8
2/4/2021	8.19	35.2	1.95	2.0	7.63	ND	0	0	7.8
2/23/2021	7.64	34.59	2.56	1.0	7.52	ND	0	0	6.5
3/11/2021	7.82	35.1	2.05	1.0	7.42	ND	0	0	6.5
3/25/2021	7.91	36.81	0.34	0.3	7.28	ND	0	0	5.3
4/8/2021	7.08	36.53	0.62	0	7.41	ND	0	0	5.0
4/22/2021	8.59	36.8	0.35	0.3	7.02	ND	0	0	4.4
5/4/2021	7.83	ND	0	0	7.22	ND	0	0	6.8
5/20/2021	8.06	37.1	0.05	0.3	8.04	ND	0	0	5.5
6/3/2021	3.71	37.02	0.13	0.1	7.49	ND	0	0	4.9
6/17/2021	5.21	ND	0	0	6.81	ND	0	0	3.9
7/1/2021	7.33	ND	0	0	NM	NM	NM	0	4.4
7/19/2021	5.16	ND	0	0	NM	NM	NM	0	4.0
7/29/2021	7.48	ND	0	0	7.18	ND	0	0	3.9
8/12/2021	7.58	ND	0	0	6.84	ND	0	0	4.4
8/26/2021	8.19	37.01	0.14	TR	6.92	ND	0	0	5.0
9/10/2021	8.63	ND	0	0	6.58	ND	0	0	2.6
9/22/2021	8.09	ND	0	0	NM	NM	NM	0	1.3
10/8/2021	8.03	ND	0	0	7.14	ND	0	0	1.0
10/20/2021	8.21	ND	0	0	NM	NM	NM	0	1.3
11/4/2021	7.70	ND	0	0	7.01	ND	0	0	2.0
11/18/2021	7.70	ND	0	0	7.11	ND	0	0	0.3
12/3/2021	7.94	ND	0	0	7.46	ND	0	0	1.3
12/16/2021	8.12	ND	0	0	7.80	ND	0	0	1.3
12/30/2021	NM	NM	NM	0	8.09	ND	Trace	0	1.5
1/14/2022	NM	NM	NM	0	8.16	ND	Trace	0	1.5
1/26/2022	NM	NM	NM	0	8.27	ND	Trace	0	1.5
2/10/2022	NM	NM	NM	0	8.88	ND	0	0	0.9
2/24/2022	NM	NM	NM	0	8.51	ND	0	0	1.1
3/10/2022	NM	NM	NM	0	8.67	ND	0	0	1.2
3/24/2022	NM	NM	NM	0	8.65	ND	0	0	0.3
4/7/2022	NM	NM	NM	0	8.90	ND	0	0	0.4
4/18/2022	NM	NM	NM	0	8.96	ND	0	0	1.3
5/2/2022	NM	NM	NM	0	9.02	ND	0	0	1.5
5/20/2022	NM	NM	NM	0	9.13	ND	0	0	1.5
6/2/2022	NM	NM	NM	0	9.26	ND	0	0	1.5
6/16/2022	NM	NM	NM	0	9.13	ND	Trace	0	0.8
6/30/2022	NM	NM	NM	0	9.23	ND	Trace	0	0.4
Total DNAPL Pumped (gal)	60.9				151.3				958.3

* - indicates DNAPL and groundwater mixture

ND - Not detected

--- - No DNAPL pumped

NM - Not measured

DTW - Depth to water (feet Below Top of Casing (BTOC))

PoP - Product on probe, not measureable

DTD - Depth to DNAPL (feet BTOC)

TR- Trace amount of DNAPL Extracted

MW-78A not measured 7/1/21, 7/19/21, 9/22/21, 10/20/21; well inaccessible due to container operations

MW-75B not measured 12/30/21; well inaccessible due to container operations

FIGURES

Figure 2
DNAPL Recovery Activities February 2013 - June 2022
UPRR Houston Wood Preserving Works

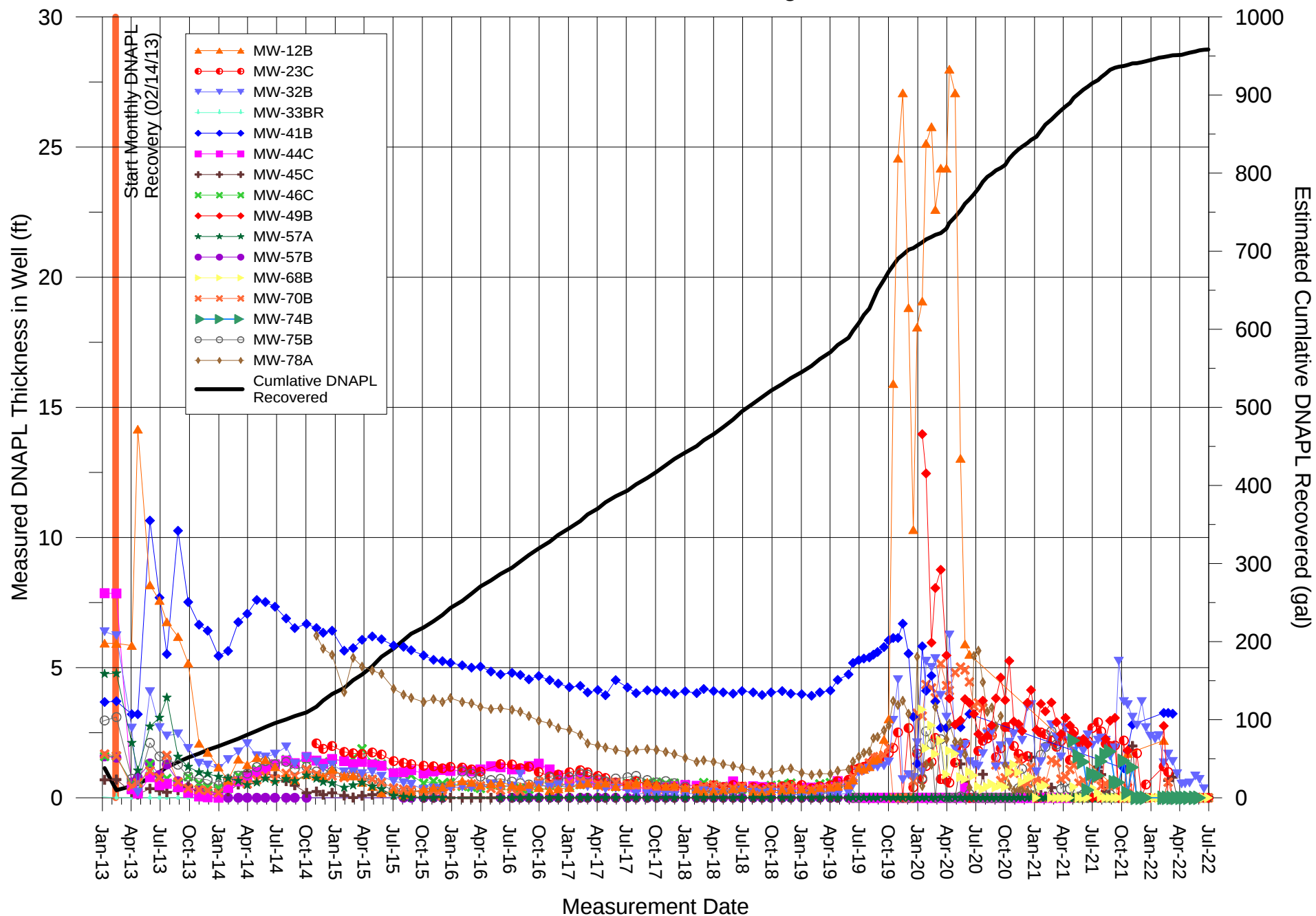


Figure 3
A-TZ Wells - DNAPL Recovery Activities July 2018 - June 2022
UPRR Houston Wood Preserving Works

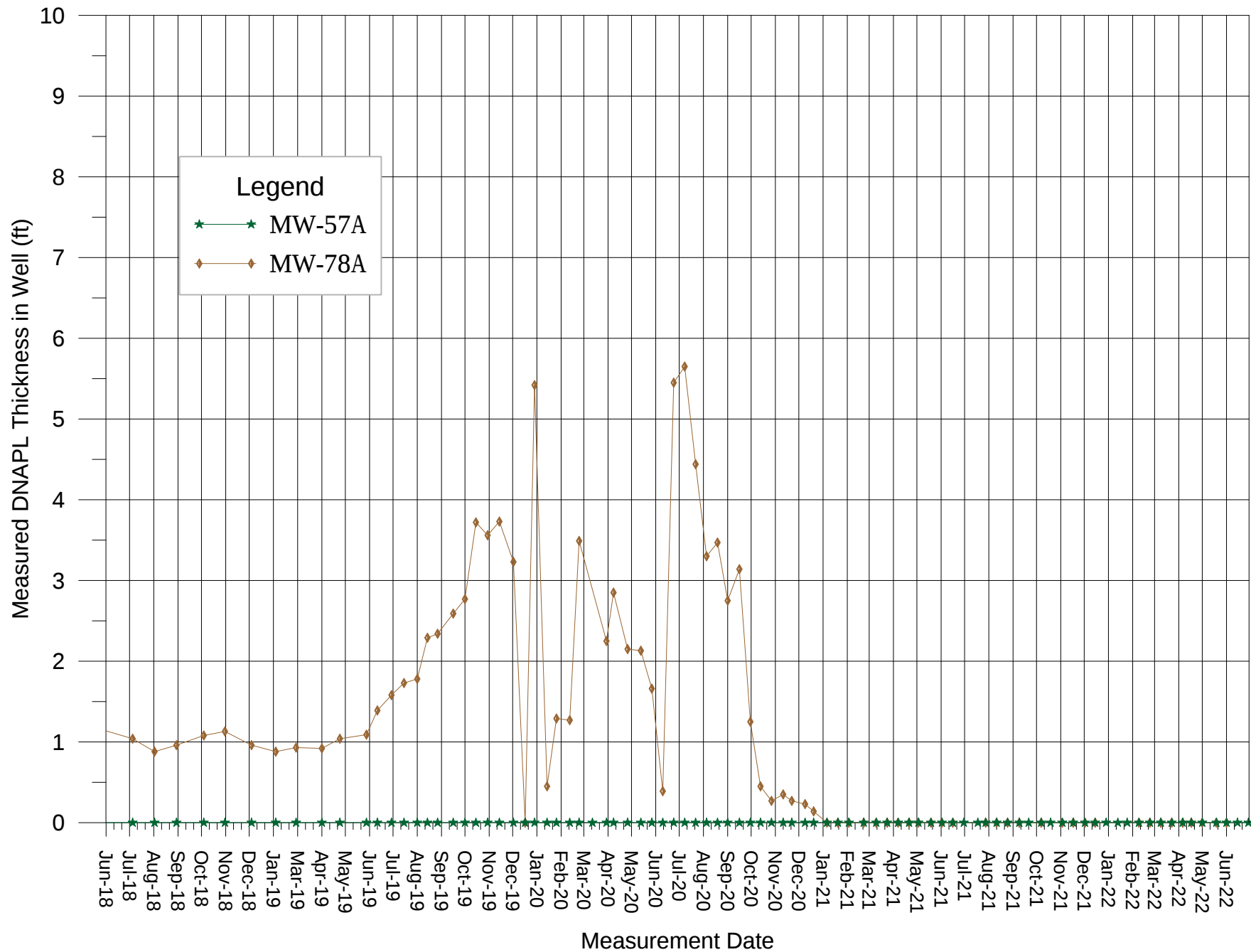
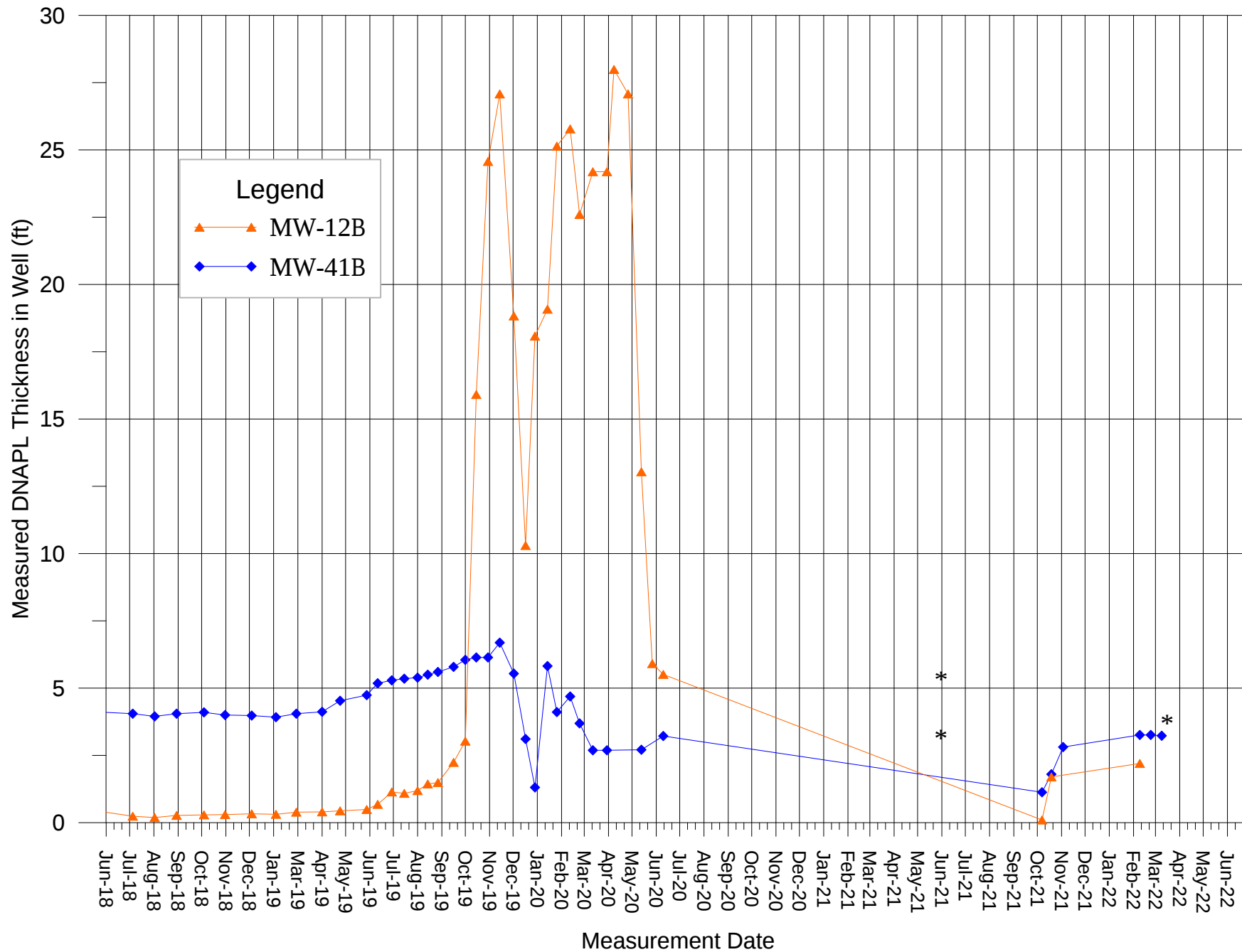


Figure 4
B-TZ Wells (West Side) - In-Well DNAPL Thickness July 2018 - June 2022
UPRR Houston Wood Preserving Works



*DNAPL below top of in-well pumps from 3rd Q 2020 to 3rd Q 2021; not measurable

Pumps removed on 10/08/2021 to measure pump length. Pumps are 1.55 ft in length. DNAPL below top of pumps November and December 2021; April-June 2022; not measurable.

Figure 5
B-CZ/B-TZ Wells (North (On-Site and Off-Site)) - In-Well DNAPL Thickness July 2018 - June 2022
UPRR Houston Wood Preserving Works

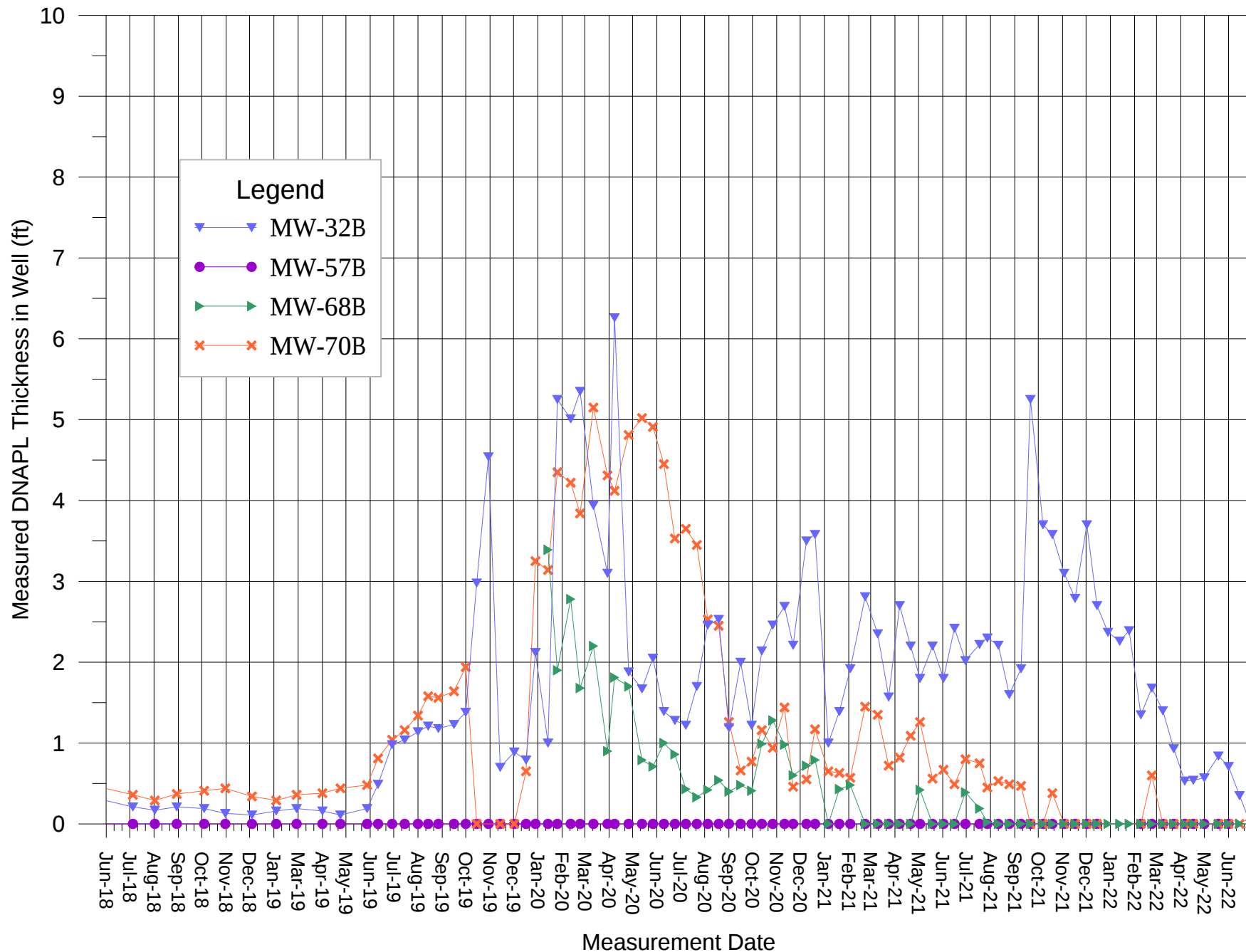


Figure 6
B-CZ/B-TZ Wells (Englewood Intermodal Yard) - In-Well DNAPL Thickness July 2018 - June 2022
UPRR Houston Wood Preserving Works

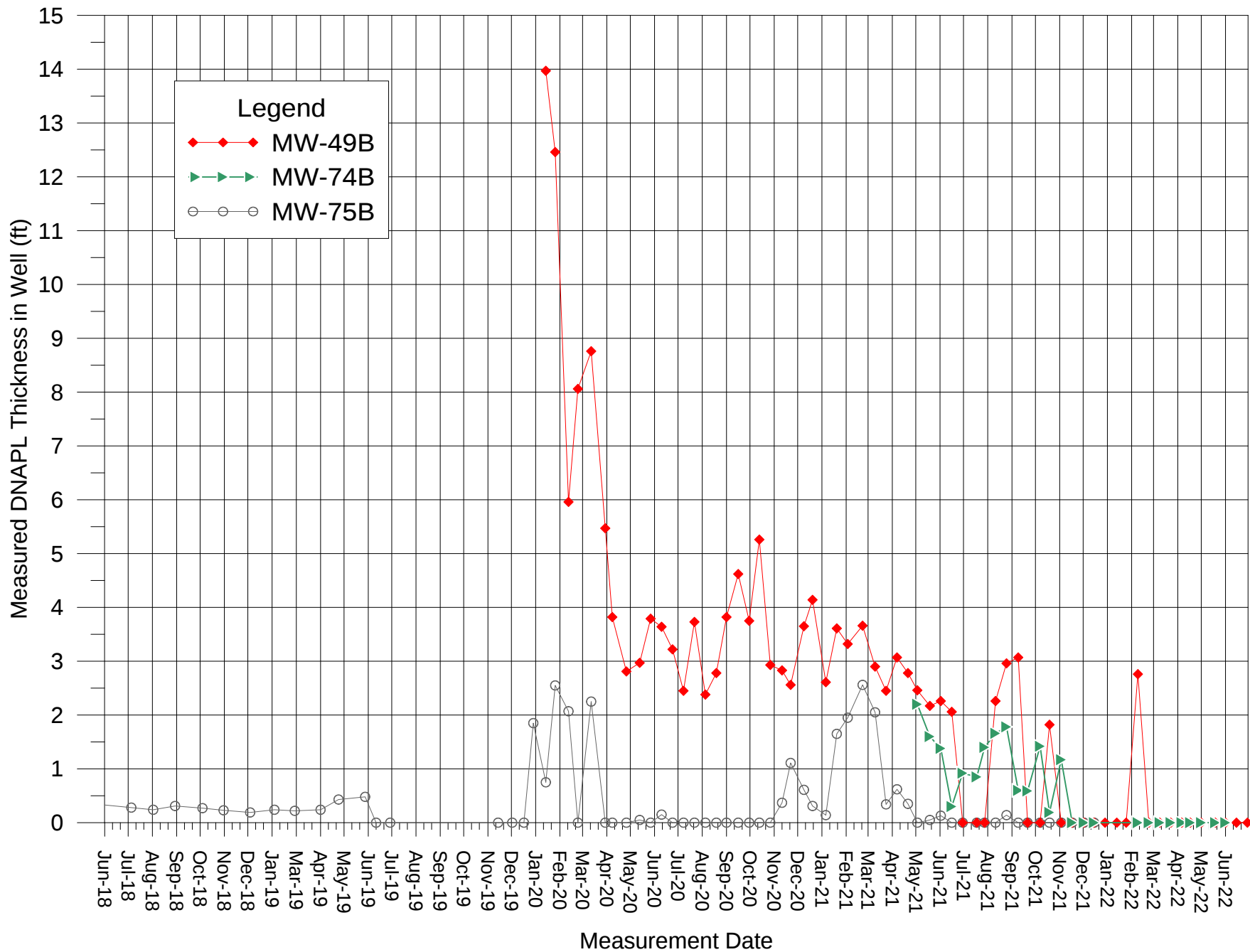
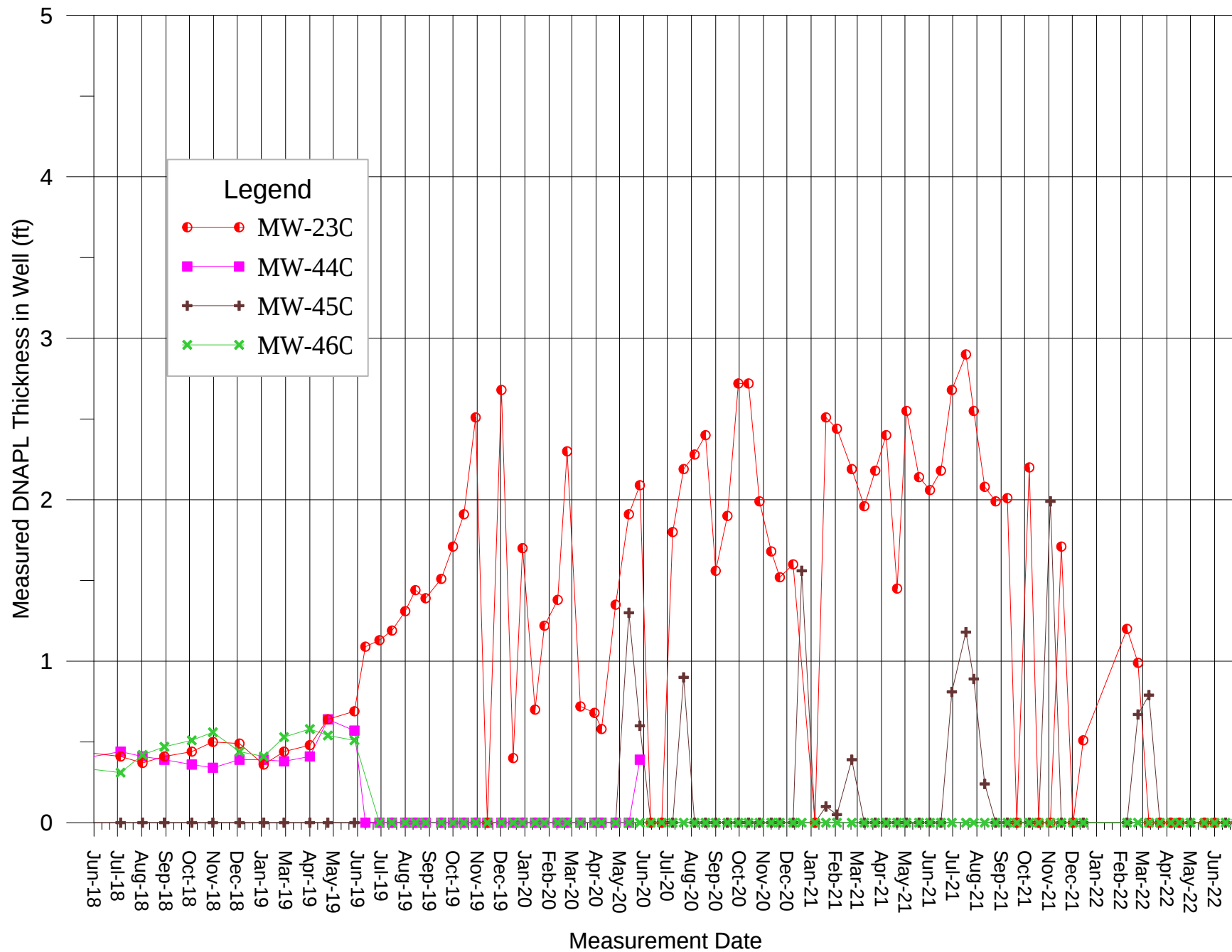


Figure 7
C-TZ Wells - In-Well DNAPL Thickness July 2018 - June 2022
UPRR Houston Wood Preserving Works



ATTACHMENT 1

Recovered DNAPL Waste Manifest

Please print or type.

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator ID Number TXDD00820206	2. Page 1 of 1	3. Emergency Response Phone 1-800-871-7267	4. Manifest Tracking Number 017115120 FLE		
5. Generator's Name and Mailing Address UPRR CIOBHO ANN Manifest Receiving 6520 Corporate Drive Indianapolis, IN 46208 (416) 267-4164				Generator's Site Address (if different than mailing address) UPRR 4910 Liberty Road Houston, TX 77026			
6. Transporter 1 Company Name OMI				U.S. EPA ID Number LA0980870018			
7. Transporter 2 Company Name				U.S. EPA ID Number			
8. Designated Facility Name and Site Address U.S. Ecology 3270 County Rd 69 Robstown, TX (800) 242-3209				U.S. EPA ID Number TXDD69452340			
GENERATOR	9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers		11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
			No.	Type			
		1. PG. NA 3082. Hazardous waste, liquid, NOS (Cresote Benzene), 9. PG III (F034)	1	DM		P	091822H F034 D018
						Received	
						JUN 29 2022	
						GHD Indianapolis	
14. Special Handling Instructions and Additional Information WP# 008345 Profile: 090120010-0 Plot# 2261165							
15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.							
Generator's/Offor's Printed/Typed Name				Signature		Month	Day Year
TRANSPORTER	16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit: _____ Transporter signature (for exports only): _____ Date leaving U.S.: _____						
	17. Transporter Acknowledgment of Receipt of Materials						
	Transporter 1 Printed/Typed Name				Signature		Month Day Year
	Jacques Antwine				Jacques Antwine		5 6 22
	Transporter 2 Printed/Typed Name				Signature		Month Day Year
DESIGNATED FACILITY	18. Discrepancy						
	18a. Discrepancy Indication Space ☐ Quantity ☒ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection Section 15 - Date 5-13-22 Section 11 - 308 on per: Ruffin Green 5-13-22 G.V.						
	18b. Alternate Facility (or Generator)				U.S. EPA ID Number		
	Facility's Phone:						
	18c. Signature of Alternate Facility (or Generator)				Month Day Year		
19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)							
1. 1141		2.		3.		4.	
20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a							
Printed/Typed Name				Signature		Month	Day Year
Arman Zamani						5	13 22