

SENT VIA E-MAIL

July 2, 2018
Project No.: 661M13236.2018.B

Mr. Kenneth Thiessen
Oregon Department of Environmental Quality
Northwest Region
700 NE Multnomah St., Suite 600
Portland, OR 97232
Thiessen.Kenneth@deq.state.or.us

**Subject: 2018 Semiannual Progress, Operations, Monitoring, and Maintenance Report
Former Koppers Facility
Wauna, Oregon**

Dear Mr. Thiessen:

On behalf of Georgia-Pacific Consumer Products LP (GP) and Beazer East, Inc. (Beazer), this semiannual progress report has been prepared for the former Koppers wood-treating facility in Wauna, Oregon. This report is submitted in accordance with Oregon Department of Environmental Quality (DEQ) Order on Consent No. LQVC-NWR-09-01. It covers operations, monitoring, and maintenance of the final remedy completed during the first and second quarters of 2018: January 1, 2018, through June 30, 2018.

ACTIONS TAKEN DURING PREVIOUS SIX MONTHS

- Monitored natural attenuation (MNA) has continued, as outlined in *Final Report: Monitored Natural Attenuation Demonstration* and approved by DEQ on May 27, 2016 (MNA Plan). The aeration trench remains off and did not operate during the first or second quarter of 2018.
- Groundwater elevations were measured during the semiannual monitoring event on April 2, 2018 and a groundwater elevation contour map was prepared.
- Semiannual groundwater quality monitoring was performed on April 2, 2018.
- The Annual Cap Inspection was performed on April 2, 2018. During the inspection, animal burrows were noted in the protective soil cap. These burrows were filled and the repairs noted on the Cap, Soil Cover, and Ditch Fill Areas Inspection and Maintenance Log. This log is included in the attached Semiannual Operation, Monitoring, and Maintenance Summary.
- A site inspection, including inspection of the shoreline and seeps along the Columbia River, was performed on April 2, 2018.

ACTIONS SCHEDULED TO BE TAKEN IN THE NEXT SIX MONTHS

- In accordance with the approved MNA Plan, only semiannual and annual reports will be provided. The next scheduled report will be the 2018 Annual Report.

PROBLEMS EXPERIENCED DURING THE PREVIOUS SIX MONTHS AND ACTIONS TAKEN TO RESOLVE THEM

- No problems were experienced during the first or second quarters of 2018.

SAMPLING, TESTING RESULTS, DATA GENERATED DURING THE PREVIOUS THREE MONTHS

- Laboratory analytical reports were received from TestAmerica Laboratories, Inc. of Pittsburgh, Pennsylvania, containing the analytical results from the April 2018 semiannual groundwater monitoring event. These data, along with groundwater level measurements, are tabulated in the Semiannual Operation, Monitoring, and Maintenance Summary enclosed with this report.

Please contact me if you have any questions regarding this progress report.

Sincerely,

**Wood Environment & Infrastructure
Solutions, Inc.**



Joel L. Eledge, CHMM
Project Manager

JE

Enclosure(s): Semiannual Operation, Monitoring, and Maintenance Summary

cc: K. Paschl, Beazer East, Inc.
M. Tiller, PE, Georgia Pacific
L. Littlejohn, Georgia Pacific



Memorandum

To	Kurt Paschl Beazer East, Inc.	Project No. 661M13236
From	Joel Eledge Christy Duitman Wood Environment & Infrastructure Solutions, Inc.	c: Kenneth Thiessen, DEQ Matt Tiller, PE, GP LaToya Littlejohn, GP Project File
Date	July 2, 2018	
Subject	Semiannual Operation, Monitoring, and Maintenance Summary January 1, 2018, through June 30, 2018 Former Koppers Facility Wauna, Oregon	

On behalf of Beazer East, Inc. and Georgia-Pacific Consumer Products LP (GP), Wood Infrastructure & Environment Solutions, Inc. has prepared this memorandum to summarize operation, maintenance, and performance monitoring for the final site remedy at the former Koppers facility in Wauna, Oregon. This memorandum covers the first and second quarters of 2018, from January 1, 2018 through June 30, 2018. This memorandum has been prepared in accordance with the requirements specified in the Operation, Monitoring, Inspection, and Maintenance Plan (O&M Plan) approved by the Oregon Department of Environmental Quality (DEQ) in January 2010 and amended in September 2016, as well as the requirements specified in Order on Consent No. LQVC-NWR-09-01.

SUMMARY OF OPERATIONS

The aeration trench has remained shut down since June 13, 2016, for the implementation of the monitored natural attenuation plan presented in *Final Report: Monitored Natural Attenuation Demonstration* and approved by DEQ on May 27, 2016. In accordance with the O&M Plan, the Annual Cap Inspection was performed on April 2, 2018 and a copy of the inspection log is included in Attachment 1.

MAINTENANCE

On April 2, 2018, the Annual Cap Inspection was performed. During the inspection, small animal burrows were noted in the protective soil cap near PMW-13 (Figure 1). These burrows were filled and the repairs noted on the Cap, Soil Cover, and Ditch Fill Areas Inspection and Maintenance Log (Attachment 1).

SEMIANNUAL GROUNDWATER MONITORING

The first 2018 semiannual groundwater monitoring event was conducted on April 2, 2018. Depth to groundwater measurements were taken on April 2, 2018, and are summarized on Table 1. The water level measurements were used to prepare the groundwater elevation contours presented in Figure 1. The groundwater flow pattern shown on Figure 1 is generally consistent with previous results and demonstrates that the final groundwater remedy continues to meet hydraulic performance objectives. The April Water Level Monitoring Record is included in Attachment 2.

During semiannual groundwater monitoring, the 13 monitoring wells for the final remedy were sampled and analyzed in accordance with the requirements specified in the O&M Plan. The analytical results, summarized on Table 2, are generally consistent with previous results and detected concentrations in point-of-compliance wells (ATT-12 and PMW-7R) were all below the Level II screening level values. The Groundwater Sampling Logs are included in Attachment 2. Data validation was performed in accordance with the O&M Plan. A summary of validation procedures and qualifications are included in Attachment 3.

Attachments:	Table 1:	April 2, 2018, Groundwater Elevations
	Table 2:	April 2018 Groundwater Monitoring Analytical Results
	Figure 1:	Groundwater Elevations
	Attachment 1:	Annual Cap Inspection Form
	Attachment 2:	Groundwater Sampling Logs
	Attachment 3:	Data Validation Memo



TABLE 1**APRIL 2, 2018 GROUNDWATER ELEVATIONS**

Former Koppers Facility
Wauna, Oregon

Well Number	Time	Ground Elevation ¹ (feet)	Top of Casing Elevation ¹ (feet)	Groundwater		
				Measured Depth to Water (feet btoc)	Depth Below Grade (feet)	Elevation ¹ (feet)
ATT-01	11:00	10.26	12.31	4.06	2.01	8.25
ATT-02	11:05	12.69	15.21	6.69	4.17	8.52
ATT-03	11:10	11.51	14.06	5.67	3.12	8.39
ATT-04	11:15	10.54	12.73	4.68	2.49	8.05
ATT-05	11:20	12.43	14.37	5.38	3.44	8.99
ATT-06	11:25	11.98	14.11	5.20	3.07	8.91
ATT-10	11:30	10.42	12.57	3.48	1.33	9.09
ATT-11	11:35	12.21	13.88	6.20	4.53	7.68
ATT-12	11:40	9.34	11.27	5.05	3.12	6.22
PMW-2	11:45	9.18	11.62	2.22	-0.22	9.40
PMW-5	11:50	12.72	12.33	-- ²	-- ²	-- ²
PMW-6	11:55	9.38	9.28	-- ³	-- ³	-- ³
PMW-7R	12:00	9.73	11.82	4.92	0.23	9.50
PMW-13	12:05	11.21	13.54	3.95	1.62	9.59
SBW-01	12:10	10.25	12.35	5.38	3.28	6.97
SBW-02	12:15	10.29	12.71	2.95	0.53	9.76
SBW-03	12:20	10.65	10.06	-- ²	-- ²	-- ²
SBW-04	12:25	11.29	10.87	-- ²	-- ²	-- ²
SBW-05	12:30	10.42	10.06	4.57	4.93	5.49
SBW-06	12:35	11.42	11.02	1.44	1.84	9.58
SBW-07	12:40	10.86	10.51	5.06	5.41	5.45
SBW-08	12:45	9.37	8.85	2.65	3.17	6.20
SBW-09	12:50	10.65	12.85	5.65	3.45	7.20
SBW-10	13:00	10.85	12.91	3.39	1.33	9.52

Notes

1. Elevation Datum: NGVD29. All elevations are relative to this datum.
2. Groundwater elevation could not be measured, monument was buried on April 2, 2018.
3. Groundwater elevation could not be measured, water level exceeded the top of casing.

Abbreviations

btoc = below top of casing

NGVD29 = National Geodetic Vertical Datum of 1929

TABLE 2

APRIL 2018 GROUNDWATER MONITORING ANALYTICAL RESULTS

Former Koppers Facility
Wauna, Oregon

Concentrations are in micrograms per liter (µg/L)

Constituent	ATT-01	ATT-02	ATT-03	ATT-04	ATT-05	ATT-06	Dup ATT-06	Level II SLV
Date	04/02/2018	04/02/2018	04/02/2018	04/02/2018	04/02/2018	04/02/2018	04/02/2018	(µg/L)
Ethylbenzene	6.2	13	0.051 U	0.051 U	8.8	3.4	4.2	7.3
Benzoic acid	0.96 U	0.96 U	0.92 U	0.096 U	0.96 U	0.96 U	0.92 U	42
bis(2-Ethylhexyl) phthalate	4.8 U	4.8 U	4.6 U	4.8 U	4.8 U	4.8 U	4.6 U	3
Dibenzofuran	0.14 J	1.9	0.073 U	0.076 U	6.2	1.7	2.6	3.7
Fluoranthene	0.063 U	0.063 U	0.060 U	0.063 U	0.063 U	0.063 U	0.060 U	6.2
Fluorene	1.2	4.5	0.096 U	0.072 U	8.9	4.9 J	7.9 J	3.9
2-Methylphenol	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	13
Naphthalene	70 D	160 D	0.059 U	1.1	220 D	36 J	82 DJ	620
Pentachlorophenol	0.25 U	0.25 U	0.24 U	0.25 U	0.25 U	0.25 U	0.24 U	15
Phenanthrene	0.087 J	2.5	0.066 J	0.057U	3.0	2.6 J	4.3 J	6.3

TABLE 2

APRIL 2018 GROUNDWATER MONITORING ANALYTICAL RESULTS

Former Koppers Facility
Wauna, Oregon

Concentrations are in micrograms per liter (µg/L)

Constituent	ATT-10	ATT-11	ATT-12	PMW-7R	SBW-05	SBW-07	SBW-08	Level II SLV
Date	04/02/2018	04/02/2018	04/02/2018	04/02/2018	04/02/2018	04/02/2018	04/02/2018	(µg/L)
Ethylbenzene	0.51 U	0.051 U	0.051 U	0.051 U	3.0	0.051 U	0.051 U	7.3
Benzoic acid	0.92 U	0.92 U	0.96 U	0.96 U	0.92 U	0.92 U	0.96 U	42
bis(2-Ethylhexyl) phthalate	4.6 U	4.6 U	4.8 U	4.8 U	4.6 U	4.6 U	4.8 U	3
Dibenzofuran	0.087 J	0.073 U	0.076 U	0.076 U	2.3	0.073 U	0.076 U	3.7
Fluoranthene	0.060 U	0.060 U	0.063 U	0.063 U	0.060 U	0.060 U	0.063 U	6.2
Fluorene	4.0	0.069 U	0.072 U	0.072 U	2.7	0.069 U	0.072 U	3.9
2-Methylphenol	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	13
Naphthalene	14	0.48	0.17 J	0.061 U	110 D	0.059 U	0.061 U	620
Pentachlorophenol	0.24 U	0.24 U	0.25 U	0.25 U	0.24 U	0.024 U	0.25 U	15
Phenanthrene	0.80	0.055 U	0.057 U	0.057 U	0.35	0.084 J	0.075 J	6.3

Notes

µg/L = micrograms per liter

Data qualifiers are as follows:

D = The result is reported from a dilution.

J = The reported result is an estimate.

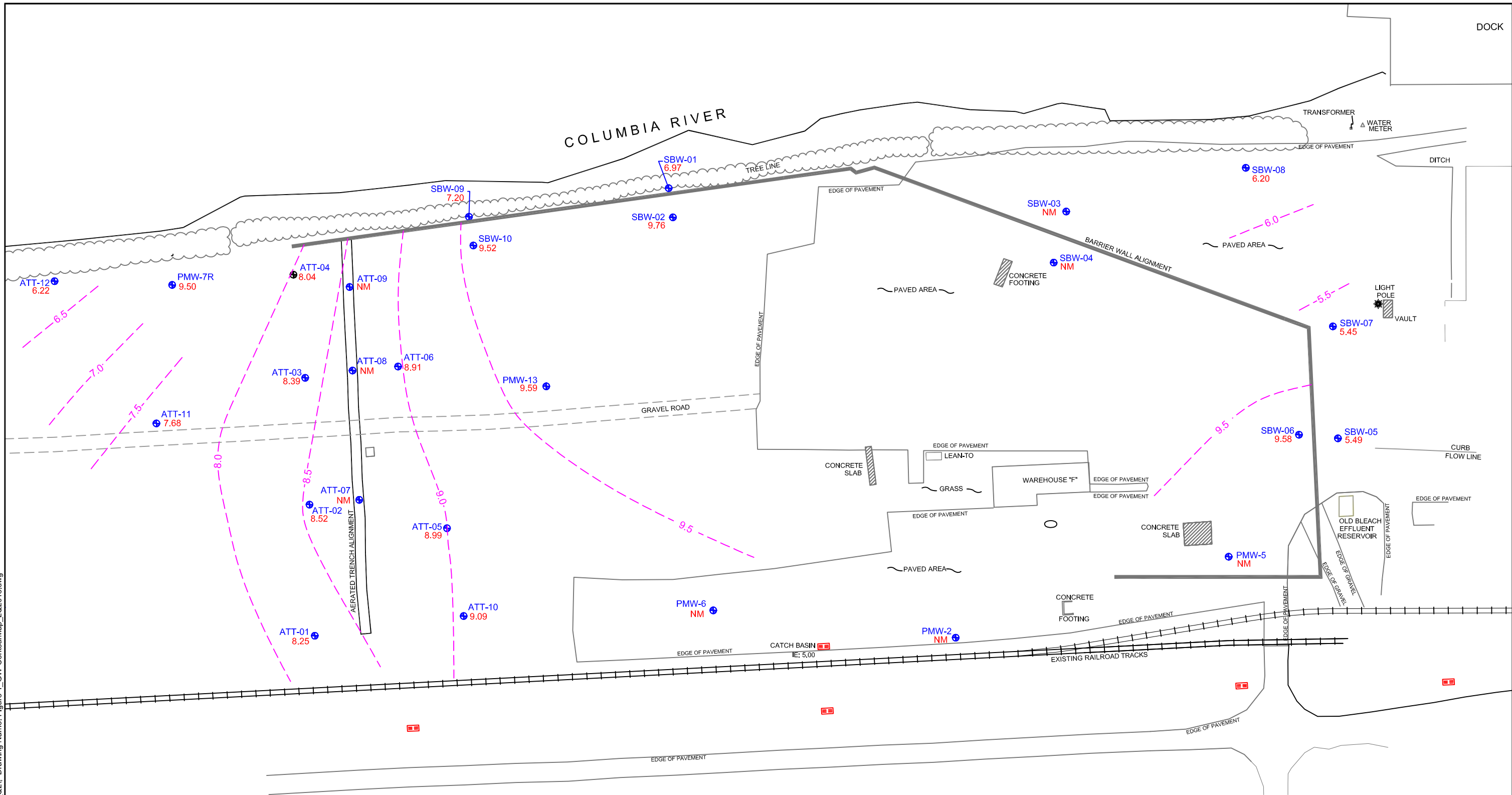
U = Analyte was not detected at the concentrations indicated, which is standard laboratory detection limit

PMW-7R and ATT-12 are points of compliance.

SLV = Oregon Department of Environmental Quality Screening Level Value, Guidance for Ecological Risk Assessment, December 2001.

Bold indicates that the constituent concentration exceeds the Oregon Level II SLV.

Plot Date: 06/22/18 - 12:44pm, Plotted by: patrick.mccarthy
Drawing Path: K:\13000\13200\13236\DWG\2018_Q2\, Drawing Name: Figure 1_GW-ContourMap_202018.dwg

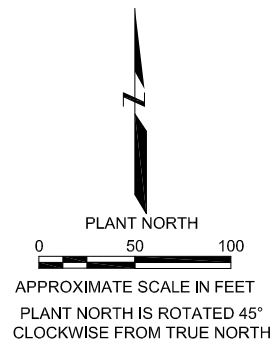


LEGEND:

- ATT-10 7.99 • Groundwater Monitoring Well with Groundwater Elevation (Feet)
- 7.0 - - - Groundwater Elevation Contour (In Feet Above Mean Sea Level) (Dashed Where Approximate)
- NM Groundwater elevations were not measured for wells completed in active aeration trench wells that were inaccessible/buried, or because the groundwater elevation exceeded the top of casing elevation.

NOTES:

1. Contour Interval = 0.5 (feet)
2. Vertical Datum is based on NGVD 29
3. No contours were drawn along the river north of the barrier wall due to insufficient data.



wood.

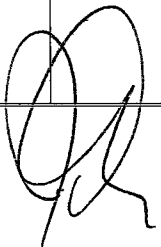
**GROUNDWATER ELEVATIONS
APRIL 2, 2018
Former Koppers Facility
Wauna, Oregon**

By: PM	Date: 06/22/18	Project No.132360.2018B
Wood Environment & Infrastructure Solutions, Inc.		Figure 1

CAP, SOIL COVER, AND DITCH FILL AREAS INSPECTION AND MAINTENANCE LOG

Former Koppers Facility
Wauna, Oregon

Inspection/Maintenance Issue			Maintenance Issue Resolution		
Name	Date	Description	Name	Date	Description
Jason Gardner	4/2/2018	Gopher holes (PMW-13)	Jason Gardner	4/2/2018	Filled with gravel
"	"	Leaking Facility Pumping well.	"	"	Informed mill, they are aware.
"	"	All burms & liners are intact/covered	N/A	N/A	N/A



Jason Gardner 4/2/2018

Wood Environment & Infrastructure
Solutions, Inc.

April Water Level Monitoring Record
Former Koppers Facility
Wauna, Oregon

Date: 04/02/18

Measured By: WJM

Instrument Used: Solinst

Well Name	Time (24-hour)	TOC Elevation (feet)	Water Level Below TOC (feet)	Average WL Below TOC	Min/Max WL Below TOC	Remarks
ATT-01	11:00	12.31	4.06	2.30	2.29 / 2.9	
ATT-02		15.21	6.69	4.25	4.39 / 5.11	
ATT-03		14.06	5.67	3.27	3.29 / 4.02	
ATT-04		12.73	4.68	2.72	2.74 / 3.42	
ATT-05		14.37	5.38	3.66	3.74 / 4.50	
ATT-06		14.11	5.20	3.38	3.42 / 4.15	
ATT-10		12.57	3.48	1.78	1.62 / 2.41	
ATT-11		13.88	6.20	3.88	4.51 / 5.25	
ATT-12		11.27	5.05	2.46	2.82 / 3.31	
PMW-2		11.62	2.22	0.14	0.02 / 0.43	
PMW-5		12.33	Burred	2.94	3.04 / 3.57	
PMW-6		9.28	TOC +	0.37	0.22 / 0.85	
PMW-7R		11.82	4.92	2.72	2.77 / 3.41	
PMW-13		13.54	3.95	2.21	2.12 / 2.85	
SBW-1		12.35	5.38	4.14	3.99 / 5.43	
SBW-2		12.71	2.95	1.10	0.86 / 1.65	
SBW-3		10.06	Burred	4.46	4.31 / 5.47	
SBW-4		10.87	Burred	1.69	1.55 / 2.18	
SBW-5		10.06	4.57	3.62	3.20 / 4.68	
SBW-6		11.02	1.44	1.87	1.84 / 2.31	
SBW-7		10.51	5.04	4.36	4.40 / 5.31	
SBW-8		8.85	2.65	3.42	3.14 / 5.91	
SBW-9		12.85	5.65	4.77	4.55 / 6.29	
SBW-10	1300	12.91	3.39	2.15	2.07 / 2.82	

Elevation Datum: NGVD 29. All elevations are relative to this datum.

toc = below top of casing

MONITORING WELL/PIEZOMETER NUMBER ATT-01

Date: 4/2/18

Weather Conditions: P. Clear

Wind Speed/Direction: west ~ 3 mph

Sampler: W6 W3N

Casing Diameter (in): 2"
 Top of Casing Elevation (ft): —
 Initial Depth to Water (ft): 262.65 4.06
 Wellhead Condition: Good

Groundwater Elevation (ft):
Depth of Well Casing (ft):
Actual Purge Volume (gallons): 42

[illegible]

Water Level Ind. Model & No.: Solinst 101 or equivalent

ORP/DO Meter Model & No.: Horiba U-22 or equivalent

Purge Equipment Used: peristaltic pump

Sampling Equipment Used: peristaltic pump, 2" diameter disposable bailer

Purge Start Time: 15:05

Sample Collection Time: 15:25

Purge Completion Time: 19.35

Purging Method: peristaltic pump

Average Purge Rate (mL/min): 2.4

Sample Containers Used: x40ml (HCl), x1L

Analytical Lab: ALS Kelso

Chemical Analyses: SVOCs, VOCs

Other Field Observations:

MONITORING WELL/PIEZOMETER NUMBER ATT-02

Date: 4/2/18

Weather Conditions: P, Clear

Sampler: JVC/VJM

Wind Speed/Direction: West ~ 2 mph

Groundwater Elevation (ft): 1

Depth of Well Casing (ft): _____

Actual Purge Volume (gallons): 2.4

liter

MONITORING WELL/PIEZOMETER NUMBER **ATT-03**

Date: 4/2/18

Weather Conditions: D. Clear

Sampler: JVG / WJM

Wind Speed/Direction: West ~ 3 MPH

Casing Diameter (in): 2"

Groundwater Elevation (ft):

Top of Casing Elevation (ft): _____

Depth of Well Casing (ft): _____

Initial Depth to Water (ft): 5.67

Actual Purge Volume (gallons): 3L

Wellhead Condition: Good (one bent bolt)

[illegible]

Water Level Ind. Model & No.: Solinst 101 or equivalent

ORP/DO Meter Model & No.: Horiba U-22 or equivalent

Purge Equipment Used: peristaltic pump

Sampling Equipment Used: peristaltic pump, 2" diameter disposable bailer

Purge Start Time: 16.00

Sample Collection Time: 16:15

Purge Completion Time: 16:15

Purging Method: peristaltic pump

Average Purge Rate (mL/min): 0.249

Sample Containers Used: x40ml (HCl), x1L

Analytical Lab: ALS Kelso

Chemical Analyses: SVOCs, VOCs

Other Field Observations: Gray bio @ start of purge

GROUNDWATER SAMPLING LOG

Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER ATT-04

Project Name: Former Koppers Facility, Wauna, OR

Date: 4/2/18

Project Number: 661M132360.2018.B

Weather Conditions: P. Clear

Location: Wauna, OR

Sampler: 206 / Win

Wind Speed/Direction: West ~3

WELL INFORMATION

Casing Diameter (in): 2"

Top of Casing Elevation (ft): _____

Initial Depth to Water (ft): 4.68

Wellhead Condition: Good

Groundwater Elevation (ft): _____

Depth of Well Casing (ft): _____

Actual Purge Volume (gallons): 4.4

PURGING MEASUREMENTS

[illegible]

Sample ID No.: ATT-04- 040218

Water Level Ind. Model & No.: Solinst 101 or equivalent

ORP/DO Meter Model & No.: Horiba U-22 or equivalent

Purge Equipment Used: peristaltic pump

Sampling Equipment Used: peristaltic pump, 2" diameter disposable bailer

Purge Start Time: 11:20

Sample Collection Time: 16:40

Purge Completion Time: 16:40

Purging Method: peristaltic pump

Average Purge Rate (mL/min): 129

Sample Containers Used: x40ml (HCl), x1L

Analytical Lab: ALS Kelso

Chemical Analyses: SVOCs, VOCs

Other Field Observations:

MONITORING WELL/PIEZOMETER NUMBER **ATT-05**

Date: 4/2/43

Weather Conditions: 7. Clear

Sampler: UVG-WSM

Wind Speed/Direction: West ~ 3 mph

Casing Diameter (in): 2"

Groundwater Elevation (ft): _____

Top of Casing Elevation (ft):

Depth of Well Casing (ft): _____

Initial Depth to Water (ft): 5.30

Actual Purge Volume (gallons): 4L

Wellhead Condition: Good

[illegible]

Sample ID No.: ATT-05- 040214

Water Level Ind. Model & No.: Solinst 101 or equivalent

ORP/DO Meter Model & No.: Horiba U-22 or equivalent

Purge Equipment Used: peristaltic pump

Sampling Equipment Used: peristaltic pump, 2" diameter disposable bailer

Purge Start Time: 14:10

Sample Collection Time: 14:30

Purge Completion Time: 14:38

Purging Method: peristaltic pump

Average Purge Rate (mL/min): 1.26/min

Sample Containers Used: x40ml (HCl), x1L

Analytical Lab: ALS Kelso

Chemical Analyses: SVOCs, VOCs

Other Field Observations: orange bird initially on purple water

GROUNDWATER SAMPLING LOG

Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER ATT-06

Project Name: Former Koppers Facility, Wauna, OR

Date: 4/2/18

Project Number: 661M132360.2018.B

Weather Conditions: Blue

Location: Wauna, OR

Sampler: WIS / WYM

Wind Speed/Direction: SW in 1-3

WELL INFORMATION

Casing Diameter (in): 2"

Groundwater Elevation (ft):

Top of Casing Elevation (ft):

Depth of Well Casing (ft):

Initial Depth to Water (ft): 5.20

Actual Purge Volume (gallons): 102

Wellhead Condition:

PURGING MEASUREMENTS

[illegible]

Sample ID No.: ATT-06-040218 AND Dup-040218

Water Level Ind. Model & No.: Solinst 101 or equivalent

ORP/DO Meter Model & No.: Horiba U-22 or equivalent

Purge Equipment Used: peristaltic pump

Sampling Equipment Used: peristaltic pump, 2" diameter disposable bailer

Purge Start Time: 13:30

Sample Collection Time: 14:00

Purge Completion Time: 14:00

Purging Method:	peristaltic pump
-----------------	------------------

Average Purge Rate (mL/min): 124 mL

Sample Containers Used: x40ml (HCl), x1L

Analytical Lab: ALS Kelso

Chemical Analyses: SVOCs, SVOC's DUP, VOCs,
VOCs DUP

Other Field Observations: Dug collected w/ sample

MONITORING WELL/PIEZOMETER NUMBER ATT-10

Date: 4/02/18

Weather Conditions: P. Clear

Sampler: 106 / WSM

Wind Speed/Direction: west ~2-3

Casing Diameter (in): 2"

Groundwater Elevation (ft): _____

Top of Casing Elevation (ft): _____

Depth of Well Casing (ft): _____

Initial Depth to Water (ft): 3.48

Actual Purge Volume (gallons): 42

Wellhead Condition: Good

[illegible]

Water Level Ind. Model & No.: Solinst 101 or equivalent

Purge Equipment Used: peristaltic pump

Burge Start Time: 11:40 Sample Collection Time: 15:00

Purge Start Time: 14:40 Sample Collection Time: 15:00
Purge Completion Time: 15:00 Purging Method: peristaltic pump

Purge Completion Time: 19:00 Purging Method: peristaltic pump
Average Purge Rate (ml /min): 2.44 Sample Containers Used: x40ml (HCl) x1l

Average Purge Rate (ml/min): 12 ml/min
Analytical Lab: ALS Kelso

Analytical Lab. AES REISO Chemical Analyses: SVCSG, VCSG

Other Field Observations: a lot of orange bio on start up

MONITORING WELL/PIEZOMETER NUMBER **ATT-11**

Date: 4/2/18

Weather Conditions: D. Clear

Sampler: SV6 / WJH

Wind Speed/Direction: West ~ 2 mph

Casing Diameter (in): 2"
 Top of Casing Elevation (ft): 7
 Initial Depth to Water (ft): 6.26
 Wellhead Condition: Good

Groundwater Elevation (ft): _____
Depth of Well Casing (ft): _____
Actual Purge Volume (gallons): 46
Liter

[illegible]

Sampling Equipment Used: peristaltic pump, 2" diameter disposable bailer

Analytical Lab: ALS Kelso

Other Field Observations: greyish / green bio in pump water

MONITORING WELL/PIEZOMETER NUMBER **ATT-12**

Date: 4/2/13

Weather Conditions: P. Clear

Sampler: JVE / WJM

Wind Speed/Direction: west 23 mph

Groundwater Elevation (ft):

Depth of Well Casing (ft): _____

Actual Purge Volume (gallons): 41

Figure 6

[illegible]

Other Field Observations: _____

MONITORING WELL/PIEZOMETER NUMBER SBW-05

Date: 4/2/18

Weather Conditions: P. clear

Sampler: SV6/W237

Wind Speed/Direction: west ~ 3 mph

Groundwater Elevation (ft):

Depth of Well Casing (ft): 10.0

Actual Purge Volume (gallons): 46

Wiers

Other Field Observations: Orange bio on purple water initially

GROUNDWATER SAMPLING LOG

Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER SBW-07

Project Name: Former Koppers Facility, Wauna, OR

Date: 4/2/18

Project Number: 661M132360.2018.B

Weather Conditions: Partly Clear

Location: Wauna, OR

Sampler: SV6/WJM

Wind Speed/Direction: _____

WELL INFORMATION

Casing Diameter (in): 2"

Groundwater Elevation (ft): N/A

Top of Casing Elevation (ft): N/A

Depth of Well Casing (ft): N/A

Initial Depth to Water (ft): 5.66

Actual Purge Volume (gallons): 6L

Wellhead Condition: Good

PURGING MEASUREMENTS

Time	Water Level (ft btoc)	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	Turbidity (NTU)	DO (mg/L)	Notes
11:40	4.95	6.25	517	11.98	+8.2	12.6	0.46	911
12:00	5.17	6.31	524	12.47	-25.7	3.0	0.45	4
12:05	5.17	6.31	524	12.48	-26.4	2.8	0.43	5
12:10	5.17	6.31	524	12.48	-26.7	2.7	0.41	6L

Sample ID No.: SBW-07-040218

Water Level Ind. Model & No.: Solinst 101 or equivalent

ORP/DO Meter Model & No.: Horiba U-22 or equivalent

Purge Equipment Used: peristaltic pump

Sampling Equipment Used: peristaltic pump, 2" diameter disposable bailer

Purge Start Time: 11:40

Sample Collection Time: 12:10

Purge Completion Time: 12:10

Purging Method: peristaltic pump

Average Purge Rate (mL/min): 0.24m

Sample Containers Used: x40ml (HCl), x1L

Analytical Lab: ALS Kelso

Chemical Analyses: SVOCs, VOCs

Other Field Observations: _____

GROUNDWATER SAMPLING LOG

Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER SBW-08

Project Name: Former Koppers Facility, Wauna, OR

Date: 4/2/18

Project Number: 661M132360.2018.B

Weather Conditions: Scattered rain

Location: Wauna, OR

Sampler: JVG/wjm

Wind Speed/Direction: 7/

WELL INFORMATION

Casing Diameter (in): 2"

Groundwater Elevation (ft): N/A

Top of Casing Elevation (ft): N/A

Depth of Well Casing (ft): N/A

Initial Depth to Water (ft): 2.65

Actual Purge Volume (gallons): 6L

Wellhead Condition: Good

Liters

PURGING MEASUREMENTS

Time	Water Level (ft btoc)	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	Turbidity (NTU)	DO (mg/L)	Notes
11:00	2.65	5.91	124	11.35	+87.2	2.6	0.53	cen
11:20	2.69	5.81	89	10.35	+45.1	0.9	0.70	4
11:25	2.69	5.80	88	10.33	+44.0	0.9	0.19	5
11:30	2.69	5.80	88	10.33	+44.1	0.9	0.20	6

Sample ID No.: SBW-08-040218

Water Level Ind. Model & No.: Solinst 101 or equivalent

ORP/DO Meter Model & No.: Horiba U-22 or equivalent

Purge Equipment Used: peristaltic pump

Sampling Equipment Used: peristaltic pump, 2" diameter disposable bailer

Purge Start Time: 11:00

Sample Collection Time: 11:30

Purge Completion Time: 11:30

Purging Method: peristaltic pump

Average Purge Rate (mL/min): 0.24m

Sample Containers Used: x40ml (HCl), x1L

Analytical Lab: ALS Kelso

Chemical Analyses: SVOCs, VOCs

Other Field Observations: _____

GROUNDWATER SAMPLING LOG

Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER PMW-07R

Project Name: Former Koppers Facility, Wauna, OR

Date: 4/2/18

Project Number: 661M132360.2018.B

Weather Conditions: P. Clear

Location: Wauna, OR

Sampler: WB / WSM

Wind Speed/Direction: West ~ 2 mph

WELL INFORMATION

Casing Diameter (in): 2"
 Top of Casing Elevation (ft): —
 Initial Depth to Water (ft): 4.92
 Wellhead Condition: Good

Groundwater Elevation (ft): —
 Depth of Well Casing (ft): —
 Actual Purge Volume (gallons): 4L

PURGING MEASUREMENTS

Time	Water Level (ft btoc)	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	Turbidity (NTU)	DO (mg/L)	Notes
16:45	4.94	6.61	135	9.85	-5.4	92.8	1.43	cell
16:50	5.02	6.54	132	9.86	-6.6	1.2	0.74	1L
16:55	5.02	6.54	131	9.81	-14.3	0.9	0.13	2L
17:00	5.02	6.55	131	9.81	-14.8	1.0	0.12	3L
17:05	5.02	6.54	131	9.82	-14.7	0.9	0.12	4L

Sample ID No.: PMW-07- 040218

Water Level Ind. Model & No.: Solinst 101 or equivalent

ORP/DO Meter Model & No.: Horiba U-22 or equivalent

Purge Equipment Used: peristaltic pump

Sampling Equipment Used: peristaltic pump, 2" diameter disposable bailer

Purge Start Time: 16:45

Sample Collection Time: 17:05

Purge Completion Time: 17:05

Purging Method: peristaltic pump

Average Purge Rate (mL/min): 0.24/L

Sample Containers Used: x40ml (HCl), x1L

Analytical Lab: ALS Kelso

Chemical Analyses: SVOCs, VOCs, MNA

Other Field Observations: orange bio in purge

Memorandum

To Joel Eledge, Project Manager File no 661M132360.2018.B
Wood Environment and Infrastructure
Solutions, Inc.

From Nathalie Perry-Freer
Wood Environment and Infrastructure
Solutions, Inc.

Date 4/30/2018

**Subject Former Koppers Wood Treating Site, Wauna, Oregon
April 2018 – Semiannual Groundwater Sampling Event
Stage 2A Data Validation – Sample Delivery Group J76417-1**

This memorandum presents a summary of the Stage 2A data validation performed on the results of 13 primary groundwater samples, one field duplicate groundwater sample, and one trip blank samples collected on April 2, 2018 at the Former Koppers Wood Treating Site in Wauna, Oregon. The samples were submitted to TestAmerica in Pittsburgh, Pennsylvania for analysis of the following:

- Ethylbenzene by EPA Method 8260C; and
- Semivolatile Organic Compounds (SVOCs) by EPA Method 8270D low level:
2-methylphenol, benzoic acid, naphthalene, dibenzofuran, fluorene, pentachlorophenol, phenanthrene, fluoranthene, and bis(2-ethylhexyl)phthalate.

The sample identifications (IDs), laboratory sample IDs, and analyses conducted on the samples are listed in Table 1, below.

Table 1: Sample IDs and Analyses

Sample ID	Laboratory Sample ID	Analyses
SBW08-040218	180-76417-1	SVOCs and ethylbenzene
SBW07-040218	180-76417-2	SVOCs and ethylbenzene
SBW05-040218	180-76417-3	SVOCs and ethylbenzene
ATT06-040218	180-76417-4	SVOCs and ethylbenzene
ATT05-040218	180-76417-5	SVOCs and ethylbenzene
ATT10-040218	180-76417-6	SVOCs and ethylbenzene
ATT01-040218	180-76417-7	SVOCs and ethylbenzene
ATT02-040218	180-76417-8	SVOCs and ethylbenzene
ATT03-040218	180-76417-9	SVOCs and ethylbenzene
ATT04-040218	180-76417-10	SVOCs and ethylbenzene
PMW07R-040218	180-76417-11	SVOCs and ethylbenzene
ATT12-040218	180-76417-12	SVOCs and ethylbenzene
ATT22040218	180-76417-13	SVOCs and ethylbenzene
DUP040218	180-76417-14	SVOCs and ethylbenzene
Trip Blank	180-76417-15	Ethylbenzene

Upon receipt, TestAmerica compared the sample labels to the chain-of-custody (COC). Analyses were not correctly specified for all samples, including the trip blank, on the COC. TestAmerica communicated with the Wood Environment and Infrastructure Solutions, Inc. (Wood) project manager to confirm the correct analytical program and to correct the COC before proceeding with the analyses. Sample cooler temperatures were recorded upon receipt and were less than the EPA-recommended maximum temperature of six degrees Celsius.

The analytical results for these samples were reviewed in accordance with the requirements specified in Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use (EPA 2009), USEPA National Functional Guidelines for Organic Data Review (EPA, 2017), and Operation, Monitoring, Inspection, and Maintenance Plan – Former Koppers Wood Treating Site – Wauna, Oregon (AMEC, 2010), the analytical methods referenced by the laboratory, Wood data review procedures, and the laboratory quality control limits. The EPA guidelines were written specifically for the Contract Laboratory Program, and have been modified for the purpose of this data quality review where they differ from the analyte specific method requirements.

The laboratory report was reviewed to assess the following: chain of custody compliance; holding time compliance; presence or absence of laboratory contamination as demonstrated by method and trip blanks; laboratory control samples (LCS), and matrix spike (MS) samples; surrogate recoveries; analytical precision as the relative percent difference (RPD) between replicate sample results (i.e., laboratory and field duplicates) or MS and matrix spike duplicates (MSD). This data validation did not include a review of the raw analytical data.

Groundwater samples were analyzed for ethylbenzene and SVOCs and were evaluated for the following:

1. Preservation and Holding Times – Acceptable
2. Blanks – Acceptable

Wood Environment & Infrastructure Solutions, Inc.

3. Surrogates – Acceptable
4. LCS/LCSD – Acceptable
5. MS/MSD – Acceptable
6. Field Duplicates – Acceptable, except as noted below:

Primary and duplicate results are summarized in Table 2, below. The project-specific control limits for field duplicate precision are less than 20% RPD for concentrations greater than five times the reporting limit (RL) or the difference between analyte concentrations shall be less than the RL for concentrations less than five times the RL. RPD is not calculated unless the analyte is detected in both the primary and field duplicate samples. Precision between primary and field duplicate results was acceptable, with the following exceptions:

- RPDs between the fluorene (47%), naphthalene (78%), and phenanthrene (49%) results from sample ATT06-040218 and DUP-040218 were high. Wood J-qualified the detected fluorene, naphthalene, and phenanthrene results from these samples due to potential sampling and/or analytical imprecision (J-FD).

Table 2: Field Duplicate Detections

Sample ID/ Field Duplicate ID	Analyte	Primary Result	Duplicate Result	RL	RPD
		(µg/L)	(µg/L)	(µg/L)	%
ATT06-040218 and DUP-040218	Dibenzofuran	1.7	2.6	1.0	42%
	Ethylbenzene	3.4	4.2	1.0	21%
	Fluorene	4.9	7.9	0.2	47%
	Naphthalene	36	82	1.1	78%
	Phenanthrene	2.6	4.3	0.2	49%

Note:
 µg/L = micrograms per liter

7. Reporting Limits and Laboratory Flags – Acceptable except as noted:
 - The detected naphthalene results from samples SBW05-040218, ATT05-040218, ATT01-010218, ATT02-040218, and DUP-040218 exceeded the instrument calibration range. TestAmerica performed dilute SVOC analysis of these samples to bring naphthalene into calibration range. Wood reported the dilute results for naphthalene and the undiluted results for the remaining SVOC analytes.
 - TestAmerica J-qualified results with concentrations between the method detection limit and the RL. Wood agrees that these results are quantitatively uncertain and has maintained TestAmerica's J qualifiers (J-DL).

OVERALL ASSESSMENT OF DATA

The completeness of the samples reviewed above and included in TestAmerica SDG J76417-1 is 100%. Few quality control issues were identified, and analytical performance was generally within specified limits. Results are usable for all purposes, as qualified. A summary of qualified results is presented in Table 3.

Table 3: Qualified Results

Sample ID	Qualified Analyte	Qualified Result (ug/L)	Qualifier Reason
SBW08-040218	Phenanthrene	0.075 J	DL
SBW07-040218	Phenanthrene	0.084 J	DL
ATT06-040218	Fluorene	4.9 J	FD
	Naphthalene	36 J	FD
	Phenanthrene	2.6 J	FD
ATT10-040218	Dibenzofuran	0.087 J	DL
ATT01-040218	Dibenzofuran	0.14 J	DL
	Phenanthrene	0.087 J	DL
ATT03-040218	Phenanthrene	0.066 J	DL
ATT12-040218	Naphthalene	0.17 J	DL
DUP-040218	Fluorene	7.9 J	FD
	Naphthalene	82 J	FD
	Phenanthrene	4.3 J	FD

Notes: DL = Detected result is between the MDL and RL.
 FD = Field duplicate imprecision

REFERENCES

EPA, 2017. EPA CLP National Functional Guidelines for Superfund Organic Methods Data Review, EPA 540 R 2017 002.

EPA, 2009. Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use, EPA-540-R-08-005.

AMEC, 2010. Operation, Monitoring, Inspection, and Maintenance Plan - Former Koppers Wood Treating Site - Wauna, Oregon: February 2010, Project 9151.011