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SENT VIA E-MAIL

July 7, 2017

Project No.: 661M13236.2016.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: 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 2017: January 1, 2017, through June 30, 2017.

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. The aeration trench remains off and did not operate during the first or second quarter of 2017.
- Groundwater elevations were measured during the semiannual monitoring event in April 2017 and a groundwater elevation contour map was prepared.
- Semiannual groundwater quality monitoring was performed in April 2017.
- The Annual Cap Inspection was performed in April 2017. 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 in April 2017.

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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 2017 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 2017.

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

- Laboratory analytical reports were received from ALS Environmental (ALS) laboratory of Kelso, Washington, containing the analytical results from the April 2017 semiannual groundwater monitoring. 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,

**Amec Foster Wheeler
Environment & Infrastructure, Inc.**



J. Stephen Barnett, RG
Senior Associate Geologist

MR/ay

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

cc: K. Paschl, Beazer East, Inc.
M. Tiller, PE, Georgia Pacific
J. Sorenson, Georgia Pacific



Memorandum

To	Kurt Paschl Beazer East, Inc.	Project No. 661M13236
From	Steve Barnett Melissa Roskamp Amec Foster Wheeler Environment & Infrastructure, Inc.	c: Kenneth Thiessen, DEQ Matt Tiller, PE, GP Jeff Sorensen, GP Project File
Date	July 7, 2017	
Subject	Semiannual Operation, Monitoring, and Maintenance Summary, First and Second Quarters 2017: January 1, 2017, through June 30, 2017 Former Koppers Facility Wauna, Oregon	

On behalf of Beazer East, Inc. and Georgia-Pacific Consumer Products LP (GP), this memorandum has been prepared by Amec Foster Wheeler Environment & Infrastructure, Inc. to summarize operation, maintenance, and performance monitoring for the final site remedy at the former Koppers facility in Wauna, Oregon. This report covers the first and second quarters of 2017, from January 1, 2017 through June 30, 2017. This report 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

On June 13, 2016, the aeration trench was shut down for implementation of the monitored natural attenuation plan presented in *Final Report: Monitored Natural Attenuation Demonstration* and approved by DEQ on May 27, 2016. The aeration trench was not operated during the first or second quarters of 2017. In accordance with the O&M Plan the Annual Cap Inspection was performed in April 2017 and a copy of the inspection form is included in Attachment 1.

MAINTENANCE

On April 18, 2017, the Annual Cap Inspection was performed. During the inspection, small animal burrows were noted in the protective soil cap near PMW-11 (Figure 1). These burrows were filled and

the repairs noted on the Cap, Soil Cover, and Ditch Fill Areas Inspection and Maintenance Log. A copy of the inspection log is included in Attachment 1.

SEMIANNUAL GROUNDWATER MONITORING

The first 2017 semiannual groundwater monitoring event was conducted on April 18, 2017. Groundwater level readings were taken on April 18, 2017, and are summarized on Table 1. The water level measurements were used to prepare the groundwater 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.

During semiannual groundwater monitoring the 13 groundwater quality monitoring wells for the final remedy were sampled and analyzed in accordance with the requirements specified in the O&M Plan. The analytical results are consistent with previous results and are summarized in Table 2. The groundwater sampling logs are included in Attachment 2. Monitoring results for the point-of-compliance wells were all well below the Level II screening level values. Data validation was performed in accordance with the O&M plan. A summary of validation procedures and qualifications is included in Attachment 3.

Attachments:	Table 1:	April 18, 2017, Groundwater Elevations
	Table 2:	April 2017 Groundwater Monitoring Analytical Results
	Figure 1:	Groundwater Elevations
	Attachment 1:	Annual Cap Inspection Form
	Attachment 2:	Groundwater Sampling Logs
	Attachment 3:	Data Validation Memo



ATTACHMENTS

TABLE 1**APRIL 18, 2017 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	8:36	10.26	12.31	4.14	2.09	8.17
ATT-02	8:39	12.69	15.21	6.72	4.20	8.49
ATT-03	8:42	11.51	14.06	5.67	3.12	8.39
ATT-04	8:45	10.54	12.73	4.79	2.60	7.94
ATT-05	8:30	12.43	14.37	5.51	3.57	8.86
ATT-06	8:05	11.98	14.11	5.33	3.20	8.78
ATT-10	8:33	10.42	12.57	3.60	1.45	8.97
ATT-11	8:57	12.21	13.88	5.95	4.28	7.93
ATT-12	8:52	9.34	11.27	4.79	2.86	6.48
PMW-2	7:50	9.18	11.62	2.20	-0.24	9.42
PMW-5	8:00	12.72	12.33	2.39	2.78	9.94
PMW-6	7:52	9.38	9.28	0.00	0.10	9.28
PMW-7R	8:50	9.73	11.82	4.79	0.23	9.50
PMW-13	8:01	11.21	13.54	4.18	1.85	9.36
SBW-01	8:15	10.25	12.35	6.82	4.72	5.53
SBW-02	8:16	10.29	12.71	3.17	0.75	9.54
SBW-03	7:44	10.65	10.06	4.19	4.78	5.87
SBW-04	7:41	11.29	10.87	3.07	3.49	7.80
SBW-05	7:30	10.42	10.06	4.32	4.68	5.74
SBW-06	7:32	11.42	11.02	1.30	1.70	9.72
SBW-07	7:36	10.86	10.51	4.57	4.92	5.94
SBW-08	8:50	9.37	8.85	2.99	3.51	5.86
SBW-09	8:20	10.65	12.85	7.58	5.38	5.27
SBW-10	8:21	10.85	12.91	3.86	1.80	9.05

Notes

1. Elevation Datum: NGVD29. All elevations are relative to this datum.

Abbreviations

btoc = below top of casing

NGVD29 = National Geodetic Vertical Datum of 1929

TABLE 2

APRIL 2017 GROUNDWATER MONITORING ANALYTICAL RESULTS^{1,2}

Former Koppers Facility

Wauna, Oregon

Concentrations are in micrograms per liter (µg/L)

Constituent	ATT-01 ³	ATT-02 ³	ATT-03	ATT-04	ATT-05 ³	ATT-06 ³	Dup ATT-06 ³	Level II SLV
Date	04/18/2017	04/18/2017	04/18/2017	04/18/2017	04/18/2017	04/18/2017	04/18/2017	(µg/L) ⁴
Ethylbenzene	14	6.6	0.050 U	0.050 U	4.9	7.9 J	12 J	7.3
2-Methylphenol	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	13
Benzoic acid	1.1 U	2.9 J	2.6 J	2.6 J	1.1 U	1.1 U	2.6 J	42
Naphthalene	230 D	280 D	0.087 J	0.022 U	0.022 U	180 D	190 D	620
Dibenzofuran	0.28	0.49	0.018 U	0.018 U	7.3	5.0	5.0	3.7
Fluorene	1.9	4.9	0.029 J	0.027 U	11	13	13	3.9
Pentachlorophenol	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	15
Phenanthrene	0.050 J	1.5	0.022 U	0.022 U	2.7	7.1	6.6	6.3
Fluoranthene	0.020 U	0.020 U	0.020 U	0.020 U	0.024 J	0.051 J	0.048 J	6.2
bis(2-Ethylhexyl) phthalate	0.99 U	1.0 U	1.0 U	0.13 U	0.97 U	2.2 J	0.99 UJ	3

TABLE 2

APRIL 2017 GROUNDWATER MONITORING ANALYTICAL RESULTS^{1,2}

Former Koppers Facility
Wauna, Oregon

Concentrations are in micrograms per liter (µg/L)

Constituent	ATT-10 ³	ATT-11	ATT-12	PMW-7R	SBW-05	SBW-07	SBW-08	Level II SLV
Date	04/18/2017	04/18/2017	04/18/2017	04/18/2017	04/18/2017	04/18/2017	04/18/2017	(µg/L) ⁴
Ethylbenzene	0.050 J	0.050 U	0.050 U	0.050 U	0.49 J	0.050 U	0.060 J	7.3
2-Methylphenol	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	13
Benzoic acid	1.1 U	2.5 J	2.6 J	2.5 J	2.7 J	2.5 J	2.9 J	42
Naphthalene	1.5	0.67	0.026 J	0.022 U	34 D	0.022 U	0.33	620
Dibenzofuran	0.098 J	0.018 U	0.018 U	0.018 U	0.78	0.018 U	0.087 J	3.7
Fluorene	5.1	0.027 U	0.027 U	0.027 U	0.80	0.027 U	0.99	3.9
Pentachlorophenol	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	15
Phenanthrene	0.89	0.022 U	0.022 U	0.022 U	0.057 J	0.022 U	2.1	6.3
Fluoranthene	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.34	6.2
bis(2-Ethylhexyl) phthalate	1.0 U	0.99 U	0.13 U	1.0 U	1.0 U	0.95 U	0.76 J	3

Notes

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

1. 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.

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

3. The reporting limits for these samples are elevated due to the laboratory diluting the samples prior to analysis.

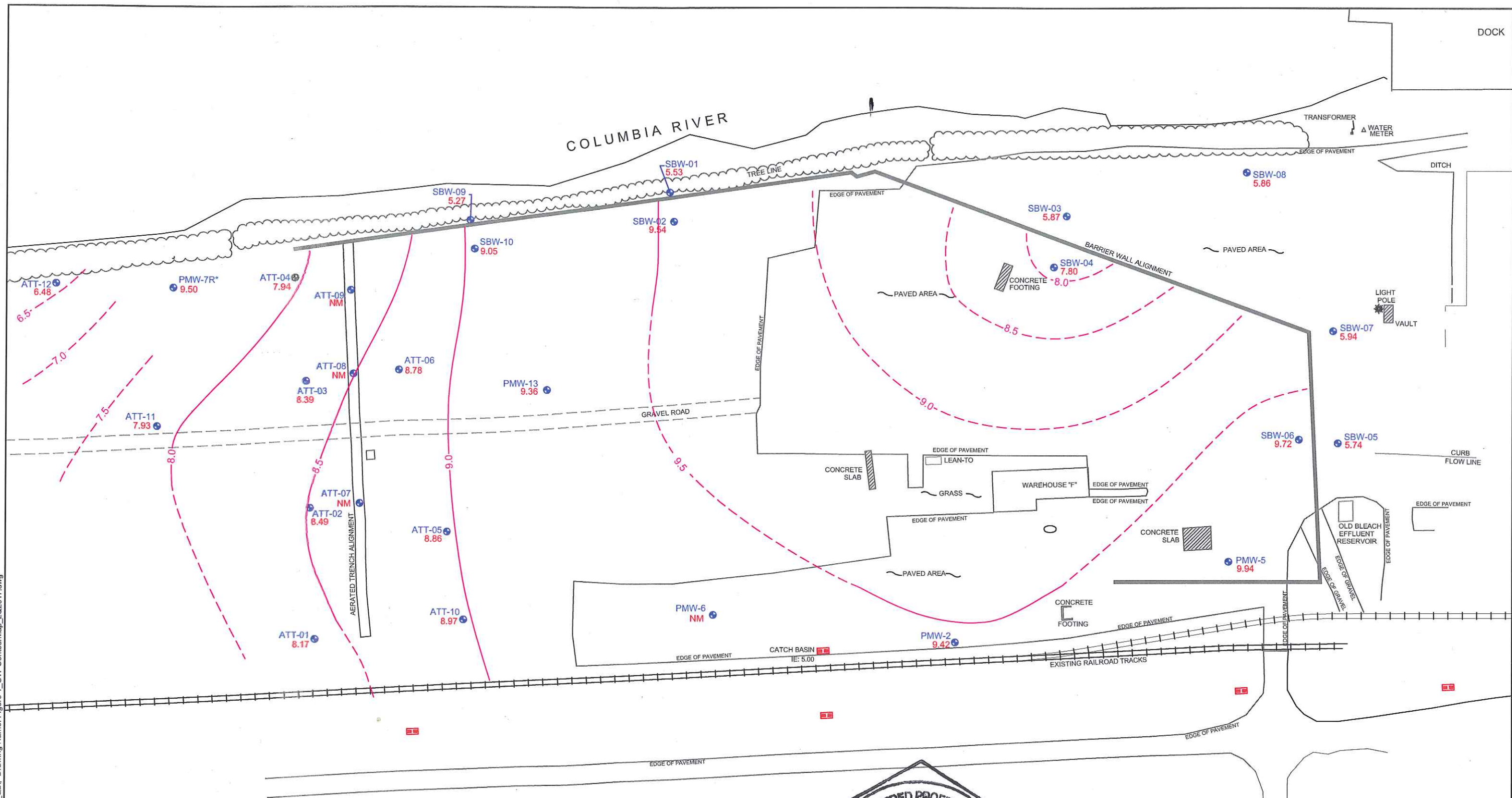
4. Level II SLVs taken from Oregon Department of Environmental Quality, Guidance for Ecological Risk Assessment, Level II Screening Level Values, December 2001.

Abbreviations

µg/L = micrograms per liter

SLV = Oregon Department of Environmental Quality Screening Level Value

Plot Date: 06/29/17 - 1:19pm, Plotted by: patrick.mccarthy
Drawing Path: K:\13000\13200\13236\DWG\2017_Q2\ Drawing Name: Figure 1_GW-ContourMap_202017.dwg

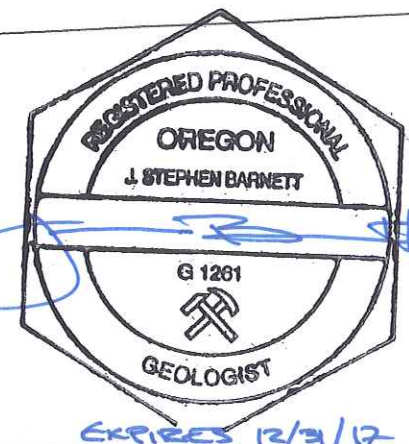


LEGEND:

- 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 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.
- * Anomalous value not used for contouring.



GROUNDWATER ELEVATIONS APRIL 18, 2017 Former Koppers Facility Wauna, Oregon			
By: PM	Date: 06/29/17	Project No.	09151
Amec Foster Wheeler Environment & Infrastructure, Inc.		Figure	1



ATTACHMENT 1

Annual Cap Inspection Form

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	4/18/17	Gopher holes in cap area near ATT	Jason Gardner	4/18/17	Filled w/ Gravel
"	"	Rest of cap in good condition.			



ATTACHMENT 2

Groundwater Sampling Logs

April Water Level Monitoring Record

Former Koppers Facility

Wauna, Oregon

Date: 4/18/17

Measured By: _____ Instrument Used: _____

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	8:30	12.31	4.14	2.30	2.29 / 2.9	
ATT-02	8:39	15.21	6.72	4.25	4.39 / 5.11	
ATT-03	8:42	14.06	5.67	3.27	3.29 / 4.02	
ATT-04	8:45	12.73	4.79	2.72	2.74 / 3.42	
ATT-05	8:50	14.37	5.51	3.66	3.74 / 4.50	
ATT-06	8:55	14.11	5.33	3.38	3.42 / 4.15	
ATT-10	8:56	12.57	3.60	1.78	1.62 / 2.41	
ATT-11	8:57	13.88	5.95	3.88	4.51 / 5.25	
ATT-12	8:52	11.27	4.79	2.46	2.82 / 3.31	
PMW-2	7:50	11.62	2.20	0.14	0.02 / 0.43	
PMW-5	8:00	12.33	2.39	2.94	3.04 / 3.57	
PMW-6	7:52	9.28	TOC Surface	0.37	0.22 / 0.85	
PMW-7R	8:50	11.82	4.79	2.72	2.77 / 3.41	
PMW-13	8:01	13.54	4.18	2.21	2.12 / 2.85	
SBW-1	8:15	12.35	4.82	4.14	3.99 / 5.43	
SBW-2	8:16	12.71	3.17	1.10	0.86 / 1.65	
SBW-3	7:44	10.06	4.19	4.46	4.31 / 5.47	
SBW-4	7:41	10.87	3.07	1.69	1.55 / 2.18	
SBW-5	7:30	10.06	4.32	3.62	3.20 / 4.68	
SBW-6	7:32	11.02	1.30	1.87	1.84 / 2.31	
SBW-7	7:36	10.51	4.52	4.36	4.40 / 5.31	
SBW-8	8:50	8.85	2.99	3.42	3.14 / 5.91	
SBW-9	8:20	12.85	7.58	4.77	4.55 / 6.29	
SBW-10	8:21	12.91	3.80	2.15	2.07 / 2.82	

ATT - 7
 ATT - 8
 ATT - 9
 OTW
 5.91
 5.37
 4.85

Elevation Datum: NGVD 29. All elevations are relative to this datum. toc = below top of casing

GROUNDWATER SAMPLING LOG

Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER ATT-12

Project Name: Former Koppers Facility, Wauna, OR

Date: 4/18/17

Project Number: 661M132360.2016.B

Weather Conditions: Partly clear

Location: Wauna, OR

Sampler: 306 / 2034

Wind Speed/Direction: _____

WELL INFORMATION

Casing Diameter (In): 2"

Groundwater Elevation (ft): _____

Top of Casing Elevation (ft): 2

Depth of Well Casing (ft): _____

Initial Depth to Water (ft): 4.79

Actual Purge Volume (gallons): _____

Wellhead Condition: Good

PURGING MEASUREMENTS

[illegible]

Sample ID No.: ATT-12- 041817

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: 11:15

Sample Collection Time: 1645

Purging Method: peristaltic pump

Sample Containers Used: x40ml (HCl), x1L

Chemical Analyses: SVOCs, VOCs

Other Field Observations: _____

MONITORING WELL/PIEZOMETER NUMBER PMW-07R

Date: 4/18/17

Weather Conditions: Partly Clear

Sampler: SV6 / WSM

Wind Speed/Direction: East ~ 1.2

Groundwater Elevation (ft): _____

Depth of Well Casing (ft): _____

Actual Purge Volume (gallons): 66

Wellhead Condition: Good

MONITORING WELL/PIEZOMETER NUMBER ATT-04

Date: 4/18/17

Weather Conditions: Partly clear

Wind Speed/Direction: E 2-3 / 1-2 mph

Sampler: JVG / WSM

Casing Diameter (in): 2"
 Top of Casing Elevation (ft): ---
 Initial Depth to Water (ft): 4.79
 Wellhead Condition: Good

Groundwater Elevation (ft): _____
 Depth of Well Casing (ft): _____
 Actual Purge Volume (gallons): 62

[illegible]

Chemical Analyses: SVOCs, VOCs

MONITORING WELL/PIEZOMETER NUMBER ATT-03

Date: 4/18/17

Weather Conditions: Partly Clear - w/ showers

Sampler: JVG / wsr

Wind Speed/Direction: East ~ 2-4 mph

Casing Diameter (in): 2"
Top of Casing Elevation (ft): —
Initial Depth to Water (ft): 15.67
Wellhead Condition: OK

Groundwater Elevation (ft): _____
 Depth of Well Casing (ft): _____
 Actual Purge Volume (gallons): 74

[illegible]

Chemical Analyses: SVOCs, VOCs

MONITORING WELL/PIEZOMETER NUMBER ATT-02

Date: 4/18/17

Weather Conditions: partly clear

Wind Speed/Direction: 22 kt ~ 1-2 AM

Sampler: SVG/WJM

Groundwater Elevation (ft): —

Depth of Well Casing (ft): _____

Actual Purge Volume (gallons): 66

Total Charges to State 18,000,000

[illegible]

Chemical Analyses: SVOCs, VOCs

Other Field Observations: Black organic blo initially in purge water w/
sulfur odor

MONITORING WELL/PIEZOMETER NUMBER ATT-01

Date: 4/18/17

Weather Conditions: Partly Clear

Sampler: JVG / WJM

Wind Speed/Direction: EAST ~ 1-2 mph

Casing Diameter (in):	2"
Top of Casing Elevation (ft):	~
Initial Depth to Water (ft):	4.14
Wellhead Condition:	Good

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

[illegible]

Chemical Analyses: SVOCs, VOCs

MONITORING WELL/PIEZOMETER NUMBER **ATT-10**

Date: 4/18/17

Weather Conditions: partly clear

Sampler: 2016-10-17

Wind Speed/Direction: East ~ 2-3

Groundwater Elevation (ft): _____

Depth of Well Casing (ft): _____

Actual Purge Volume (gallons): _____

Wellhead Condition: Good

[illegible]

Other Field Observations: _____

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

Date: 4/18/14

Weather Conditions: Partly clear

Wind Speed/Direction: East ~ 2 mph

Sampler: SV6 / W. 17

Casing Diameter (in): 2"
 Top of Casing Elevation (ft):
 Initial Depth to Water (ft): 26.552 3.51
 Wellhead Condition: (Good)

Groundwater Elevation (ft): _____
Depth of Well Casing (ft): _____
Actual Purge Volume (gallons): 151

[illegible]

Chemical Analyses: SVOCs, VOCs

Other Field Observations: Strong phenol odor.

MONITORING WELL/PIEZOMETER NUMBER SBW-07

Date: 4/18/17

Weather Conditions: Partly cloudy w/ showers

Sampler: JVG / wjg

Wind Speed/Direction: ESE wind ~2 mph

Casing Diameter (in): 2"
Top of Casing Elevation (ft): ND
Initial Depth to Water (ft): 4.79
Wellhead Condition: OK

Groundwater Elevation (ft): _____
Depth of Well Casing (ft): _____
Actual Purge Volume (gallons): 66

[illegible]

Chemical Analyses: SVOCs, VOCs

Other Field Observations: _____

MONITORING WELL/PIEZOMETER NUMBER SBW-08

Date: 4/18/17

Weather Conditions: 2014 / 61.2014

Sampler: IVG / 6217

Wind Speed/Direction: 12-25 - 2-3 mph

Casing Diameter (in): 2"
 Top of Casing Elevation (ft): —
 Initial Depth to Water (ft): 299
 Wellhead Condition: OK

Groundwater Elevation (ft):
Depth of Well Casing (ft):
Actual Purge Volume (gallons): 600

[illegible]

Other Field Observations: _____

GROUNDWATER SAMPLING LOG

Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER SBW-05

Project Name: Former Koppers Facility, Wauna, OR

Date: 4/18/17

Project Number: 661M132360.2016.B

Weather Conditions: Partly cloudy/rain

Location: Wauna, OR

Sampler: JVG/WJM

Wind Speed/Direction: East ~ 1 mph

WELL INFORMATION

Casing Diameter (in): 2"

Groundwater Elevation (ft): _____

Top of Casing Elevation (ft): _____

Depth of Well Casing (ft): _____

Initial Depth to Water (ft): 4.32

Actual Purge Volume (gallons): _____

Wellhead Condition: OK

PURGING MEASUREMENTS

Time	Water Level (ft btoc)	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	Turbidity (NTU)	DO (mg/L)	Notes
08:10	4.32	6.37	188	11.93	59.0	1.75	5.82	cell
08:30	4.36	6.24	244	12.12	78.8	1.2	2.36	4
08:35	4.36	6.24	244	12.07	78.7	0.9	2.38	5
08:40	4.36	6.24	245	12.08	78.6	0.9	2.39	6

Sample ID No.: SBW-05-041817

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: 08:10

Sample Collection Time: 08:40

Purge Completion Time: 08:40

Purging Method: peristaltic pump

Average Purge Rate (mL/min): 24 L

Sample Containers Used: x40ml (HCl), x1L

Analytical Lab: ALS Kelso

Chemical Analyses: SVOCs, VOCs

Other Field Observations: _____

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

Date: 4/18/17

Weather Conditions:

Wind Speed/Direction: ~1-2 MPH EAST

Sampler: JVG / WJM

Casing Diameter (in): 2"
 Top of Casing Elevation (ft): _____
 Initial Depth to Water (ft): 579.06 5.95
 Wellhead Condition: Good

Groundwater Elevation (ft): _____

Depth of Well Casing (ft): _____

Actual Purge Volume (gallons): 60

[illegible]

Chemical Analyses: SVOCs, VOCs

Other Field Observations:



Amec Foster Wheeler E&I, Inc.

FIELD INSTRUMENT
CALIBRATION FORMProject Name: WPDW2Project #: 60614132360.20168Date: 4/18/17Time: 7:00

INSTRUMENTATION USED

MAKE	MODEL	AMECFW No.
YSI	556	<u>5</u>
YSI	556	
HACH	2100P	
HACH KIT	IR-18C	

DAILY CALIBRATIONS

Date	Time	STANDARDIZATION:	Meter Read	Adjusted to	Units	Temp.
<u>4/18/17</u>	<u>7:00</u>	pH7	<u>7.07</u>	<u>7.01</u>	pH	<u>13.6</u>
		pH4	<u>4.01</u>	<u>4.00</u>	pH	<u>13.5</u>
		pH10	<u>9.98</u>	<u>10.00</u>	pH	<u>13.5</u>
		Sp. Cond.	<u>1000</u>	<u>1000</u>	us/cm ³	<u>13.9</u>
		ORP	<u>240.6</u>	<u>241.7</u>	millivolts	<u>12.8</u>
		D.O. %	<u>113.1</u>	<u>99.4</u>	%	<u>14.3</u>
Date	Time	STANDARDIZATION:	Meter Read	Adjusted to	Units	Temp.
		pH7			pH	
		pH4			pH	
		pH10			pH	
		Sp. Cond.			us/cm ³	
		ORP			millivolts	
		D.O. %			%	
Date	Time	STANDARDIZATION:	Meter Read	Adjusted to	Units	Temp.
		pH7			pH	
		pH4			pH	
		pH10			pH	
		Sp. Cond.			us/cm ³	
		ORP			millivolts	
		D.O. %			%	
Date	Time	STANDARDIZATION:	Meter Read	Adjusted to	Units	Temp.
		pH7			pH	
		pH4			pH	
		pH10			pH	
		Sp. Cond.			us/cm ³	
		ORP			millivolts	
		D.O. %			%	
Date	Time	STANDARDIZATION:	Meter Read	Adjusted to	Units	Temp.
		pH7			pH	
		pH4			pH	
		pH10			pH	
		Sp. Cond.			us/cm ³	
		ORP			millivolts	
		D.O. %			%	

PERIODIC CALIBRATION CHECK

Date	Time	Gelex Standards	Reading	In range?		
		0-10 NTUs				
		0-100				
		0-1000				
Date	Time	Gelex Standards	Reading	In range?		
		0-10 NTUs				
		0-100				
		0-1000				
Date	Time	STANDARDIZATION:	Meter Read	Adjusted to	Units	Temp.
Before Well		pH7			pH	
		pH4			pH	
		pH10			pH	
		Sp. Cond.			us/cm ³	
		ORP			millivolts	
		D.O. %			%	
Date	Time	STANDARDIZATION:	Meter Read	Adjusted to	Units	Temp.
Before Well		pH7			pH	
		pH4			pH	
		pH10			pH	
		Sp. Cond.			us/cm ³	
		ORP			millivolts	
		D.O. %			%	

CERTIFICATION STATEMENT

By signing below, the listed Amec Foster Wheeler sampler states that the information provided on this page is accurate.

Sampler (Print): Jason GardnerSampler Signature: [Signature]Date Signed: 4/18/17



ATTACHMENT 3

Data Validation Memo



Memorandum

To Steve Barnett, Project Manager File no 661M132360.2016.B
Amec Foster Wheeler Environment &
Infrastructure, Inc.

From Julianna Wetmore
Amec Foster Wheeler Environment &
Infrastructure, Inc.

Date 5/12/2017

**Subject Former Koppers Wood Treating Site, Wauna, Oregon
April 2017 – Semiannual Groundwater Sampling Event
Stage 2A Data Validation – Sample Delivery Group K1703844**

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 18, 2017 at the Former Koppers Wood Treating Site in Wauna, Oregon. The samples were submitted to ALS Environmental, located in Kelso, Washington 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 the table below.

Table 1: Sample IDs and Analyses

Sample ID	Laboratory Sample ID	Analyses
SBW-05-041817	K1703844-001	SVOCs and ethylbenzene
SBW-08-041817	K1703844-002	SVOCs and ethylbenzene

Sample ID	Laboratory Sample ID	Analyses
SBW-07-041817	K1703844-003	SVOCs and ethylbenzene
ATT06-041817	K1703844-004	SVOCs and ethylbenzene
ATT05-041817	K1703844-005	SVOCs and ethylbenzene
ATT10-041817	K1703844-006	SVOCs and ethylbenzene
ATT01-041817	K1703844-007	SVOCs and ethylbenzene
ATT02-041817	K1703844-008	SVOCs and ethylbenzene
ATT03-041817	K1703844-009	SVOCs and ethylbenzene
ATT04-041817	K1703844-010	SVOCs and ethylbenzene
PMW07-041817	K1703844-011	SVOCs and ethylbenzene
ATT12-041817	K1703844-012	SVOCs and ethylbenzene
ATT11-041817	K1703844-013	SVOCs and ethylbenzene
DUP-041817	K1703844-014	SVOCs and ethylbenzene
Trip Blank	K1703844-015	ethylbenzene

Upon receipt by ALS, the sample labels were compared to the chain-of-custody. The temperatures of the coolers were recorded upon receipt and were less than the acceptable maximum temperature of 6 °C. The laboratory noted that there was an insufficient amount of sample volume to perform Matrix Spike/ Matrix Spike Duplicate (MS/MSD) analysis.

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, 2014), and Operation, Monitoring, Inspection, and Maintenance Plan – Former Koppers Wood Treating Site – Wauna, Oregon (AMEC, 2010), the analytical methods referenced by the laboratory, Amec Foster Wheeler 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 reports were 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 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, except noted below:

) SVOCs: Bis(2-ethylhexyl) phthalate was detected at a concentration of 0.15 micrograms per liter (µg/L) in the method blank associated with the analysis of samples SBW-05-0418-17, SBW-08-041817, SBW-07-041817, ATT 06-041817, ATT 05-041817,

ATT 10-041817, ATT 01-041817, ATT 02-041817, ATT 03-041817, ATT 04-041817, PMW 07-041817, ATT 12-041817, ATT 11-041817, and DUP-041817.

Bis(2-ethylhexyl)phthalate either was not detected or was detected at concentrations greater than five times the blank concentration in samples SBW-08-041817, ATT 06-041817, ATT 04 041817, and ATT 12-041817. Amec Foster Wheeler U qualified the bis(2-ethylhexyl)phthalate results from samples SBW-05-0418-17, SBW-07-041817, ATT 05-041817, ATT 10-041817, ATT 01-041817, ATT 02-041817, ATT 03-041817, PMW 07-041817, ATT 11-041817, and DUP-041817 at the higher of the detected concentration or the reporting limit because the concentrations detected in the samples were less than five times the concentration detected in the blank. (U-MB)

3. Surrogates – Acceptable, except as noted below:

- J SVOCs: Recoveries of the surrogate compound terphenyl-d14 were high in samples SBW-07-041817 (115%), ATT 10-041817 (112%), and PMW-07-041817 (113%). Up to one surrogate from each fraction may be outside of laboratory-specified limits without adversely affecting data usability, and Amec Foster Wheeler did not qualify any data based on the high surrogate recoveries.

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. The project-specific control limit for field duplicate relative percent differences (RPD) is 20 percent for concentrations greater than five times the reporting limit. The RPD is not calculated unless the analyte is detected in both the primary and field duplicate. If an analyte is detected in one sample but not the other the RPD is not calculable as indicated on the table below by "NC." If the 20% RPD criterion is exceeded or an analyte is detected in only one sample the secondary criterion for evaluating field duplicate precision is that the absolute value of the difference between the primary and duplicate results should not exceed the value of the reporting limit. As shown in the table below, RPDs were acceptable.

- J The difference between bis(2-ethylhexyl) phthalate results was greater than the reporting limit of 0.99 micrograms per liter (µg/L). Amec Foster Wheeler J/UJ qualified the bis(2-ethylhexyl) phthalate results in the primary and duplicate samples as estimated because of potential sampling or analytical imprecision. (J/UJ-FD).

Table 2: Field Duplicate Detections

Sample ID/ Field Duplicate ID	Analyte	Primary Result	Duplicate Result	RL	RPD
		(µg/L)	(µg/L)	(µg/L)	%
ATT 06-041817 and DUP-041817	benzoic acid	2.9 J	2.6 J	5.0	11
	naphthalene	180 D	190 D	4.0	5
	dibenzofuran	5.0	5.0	0.20	NC
	fluorene	13	13	0.20	NC
	phenanthrene	7.1	6.6	0.20	7
	fluoranthene	0.051 J	0.048 J	0.20	6
	bis(2-ethylhexyl) phthalate	2.2	0.99 U	0.99	NC
	ethylbenzene	7.9	12	0.50	47%

Notes: J = estimated value
NC = not calculated
D = dilution

7. Reporting Limits and Laboratory Flags – Acceptable except as noted:

- ALS J qualified results with concentrations between the method detection limit (MDL) and the reporting limit (RL). Amec Foster Wheeler agrees that these results are quantitatively uncertain and has maintained ALS's J qualifiers. (J-DL)

OVERALL ASSESSMENT OF DATA

The completeness of the samples reviewed above and included in ALS SDG K1612609 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	Qualifier Reason
SBW-05-041817	Benzoic Acid	2.7 J	DL
	Phenanthrene	0.057 J	DL
	Bis(2-ethylhexyl) phthalate	1.0 U	MB
	Ethylbenzene	0.49 J	DL
SBW-08-041817	Benzoic Acid	2.9 J	DL
	Dibenzofuran	0.087 J	DL
	Bis(2-ethylhexyl) phthalate	0.76 J	DL
	Ethylbenzene	0.060 J	DL
SBW-07-041817	Benzoic Acid	2.5 J	DL
	Bis(2-ethylhexyl) phthalate	0.95 U	MB
ATT06-041817	Fluoranthene	0.051 J	DL
	Bis (2-ethylhexyl) phthalate	2.2 J	FD
	Ethylbenzene	7.9 J	FD
ATT05-041817	Fluoranthene	0.024 J	DL
	Bis(2-ethylhexyl) phthalate	0.97 U	MB
ATT10-041817	Dibenzofuran	0.098 J	DL

Sample ID	Qualified Analyte	Qualified Result	Qualifier Reason
	Bis(2-ethylhexyl) phthalate	1.0 U	MB
	Ethylbenzene	0.050 J	DL
ATT01-041817	Phenanthrene	0.050 J	DL
	Bis(2-ethylhexyl) phthalate	0.99 U	MB
ATT02-041817	Benzoic Acid	2.9 J	DL
	Bis(2-ethylhexyl) phthalate	1.0 U	MB
ATT03-041817	Benzoic Acid	2.6 J	DL
	Naphthalene	0.087 J	DL
	Fluorene	0.029 J	DL
	Bis(2-ethylhexyl) phthalate	1.0 U	MB
ATT04-041817	Benzoic Acid	2.6 J	DL
PMW07-041817	Benzoic Acid	2.5 J	DL
	Bis(2-ethylhexyl) phthalate	1.0 U	MB
ATT12-041817	Benzoic Acid	2.6 J	DL
	Naphthalene	0.026 J	DL
ATT11-041817	Benzoic Acid	2.5 J	DL
	Bis(2-ethylhexyl) phthalate	0.99 U	MB
DUP-041817	Benzoic Acid	2.6 J	DL
	Fluoranthene	0.048 J	DL
	Bis(2-ethylhexyl) phthalate	0.99 UJ	MB, FD
	Ethylbenzene	12 J	FD
Trip Blank	none		

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

REFERENCES

EPA (US Environmental Protection Agency), 2014, U.S. EPA National Functional Guidelines for Superfund Organic Methods Data Review: EPA 540-R-014-002, August.

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