

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.

Wood Environment & Infrastructure Solutions, Inc. 7376 SW Durham Road Portland, Oregon USA 97224 Tel+1 (503) 639-3400 Fax+1 (503) 620-7892 www.woodplc.com

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 Project No. 661M13236

Beazer East, Inc.

c: Kenneth Thiessen, DEQ

Matt Tiller, PE, GP LaToya Littlejohn, GP

Project File

From Joel Eledge

Christy Duitman

Wood Environment & Infrastructure

Solutions, Inc.

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).

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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

wood.

ATTACHMENTS

TABLE 1

APRIL 2, 2018 GROUNDWATER ELEVATIONS

Former Koppers Facility Wauna, Oregon

					Groundwater	
			Top of	Measured		
		Ground	Casing	Depth to	Depth Below	
		Elevation ¹	Elevation ¹	Water	Grade	Elevation ¹
Well Number	Time	(feet)	(feet)	(feet btoc)	(feet)	(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)

							Dup	
Constituent	ATT-01	ATT-02	ATT-03	ATT-04	ATT-05	ATT-06	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	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	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

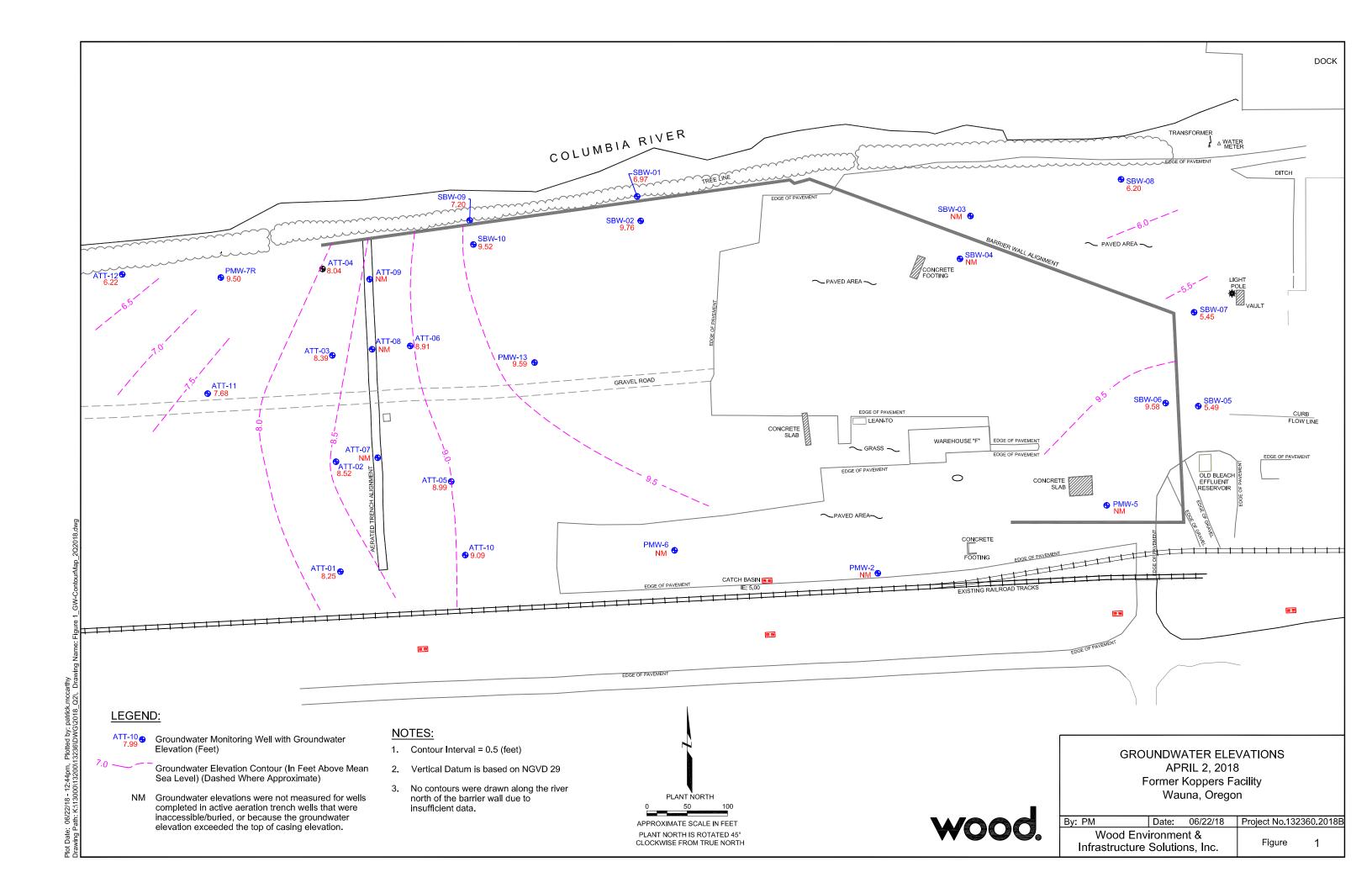
μg/L = micrograms per liter

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.



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

Former Koppers Facility Wauna, Oregon

	Inspectio	n/Maintenance Issue	W	Maintena	nce Issue Resolution
Name	Date	Description	Name	Date	Description
Jason Gorcher	4/2/3018	Gapher holes (PMW-13)	Gargue Jaean	4/2/2018	Filled with gravel.
	eę	Leaking pacility pumping well.	()	. 16	informed mill, they are owner.
lv .	M	All burms of liners ore intact/covered	NA	NIA	NG
		· · · · · · · · · · · · · · · · · · ·			
			·		

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: Usern

Instrument Used: 50 \ - est

Measured by.	<u> </u>		motiument oscu.	30 (10-03	·	
	Time	TOC Elevation	Water Level Below	Average WL	Min/Max WL	
Well Name	(24-hour)	_ (feet)	TOC (feet)	Below TOC	Below TOC	Remarks
ATT-01	(1:00	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:ce7	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	7	13.88	4.20	3.88	4.51 / 5.25	
ATT-12		11.27	5.05	2.46	2.82 / 3.31	
PMW-2		11.62	て、こて	0.14	0.02 / 0.43	
PMW-5		12.33	Burned	2.94	3.04 / 3.57	
PMW-6	7	9.28	TOC +	0.37	0.22 / 0.85	
PMW-7R	7	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	295	1.10	0.86 / 1.65	2000
SBW-3)	10.06	Bured	4.46	4.31 / 5.47	
SBW-4		10.87	Burned	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	7.	8.85	7.45	3.42	3.14 / 5.91	
SBW-9	*	12.85	5.65	4.77	4.55 / 6.29	
SBW-10	(300	12.91	3:39	2.15	2.07 / 2.82	
	<u> </u>					

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

toc = below top of casing

		MON	ITORING	WELL/PIE	ZOMET	TER NU	MBER	ATT-	01	
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	15:30	4.16	6.35	<u> </u>	11.21	- 24.6	1.7	4.20	<u> </u>	
:	151.25	4.16	6.35		11,22	- 4.(1.1	Ф.18	42	
:										
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Purge Averag			nin):	15:05 15:35 12-4m		Purging Sample	g Method Contair		peristaltic pump : _x40ml (HCl), x1L DCs, VOCs	-
Other	Field Obs	ervations:				,				_

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Locati	ion: <u>Waun</u>	a, OR							۸
Sampl	ler:	JV60/1	Min		W	ind Spee	d/Directi	on:	west range
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	Time	Water Level (ft btoc)	pH (std. units)	SC (ms/cm)	Temp.	ORP (mv)	Turbi dity (NTU)	DO (mg/L)	Notes
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	16:40	المولية بن	426		11.15	-5.4 -5.4		4.25	1-
	15:45		Ce.76		11.160	~5.4		4.27	24
	4:50		6,27		11.15	-60	<u> </u>	4.27	3L
	15-50								虹
	ાંહ								
		*							
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Purge Purge Avera	Start Tim Completi ge Purge	e: .	nin):	15:35 15:50 12/M		Sample Purging Sample	Collect g Method Contair	d: ners Use	peristaltic pump d: x40ml (HCl), x1L OCs, VOCs
Other	Field Obs	ervations:							

MONITORING	G WELL/PIE	ZOMET	ER NU	MBER	ATT	-03	
Project Name: Former Koppers F	acility, Waun	<u>a, OR</u>		D-4	d	dalie	
m + (N -	В	187	aathau C	;Date:		(2) 18 2. Cles C	
Project Number: 661M132360.2018.			eather Co	onaitions	»:	P. CIEDI	
Location: <u>Wauna, OR</u> Sampler: <u> </u>		30/	ind Snao	d/Dirocti	on:	1.305 1. 3 tomil	
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	WELI	_L INFORMATION					
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	6.15		Purging	g Method	ł:	peristaltic pump	
Average Purge Rate (mL/min):	.24/1	<u> </u>				i: x40ml (HCl), x1L	
Analytical Lab: ALS Kelso	1		Chemic	cal Analy	ses: <u>SV</u>	OCs, VOCs	
her Field Observations: <u>らたべ から め かかか な アルタタ</u>							

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Wellhe	ad Condi	tion:	_G004	<u> </u>						
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Purge	Equipme	nt Used:	<u>perist</u>	altic pump	12		la ballan			
Sampl	ing Equip	ment Used		altic pump, 2"	alameter				d d	
	Start Tim			10120				ion Time:	peristaltic pump	
Purge	Completi	on Time:		16140			g Method e Contair		i: x40ml (HCl), x1	īL
		Rate (mL/n ALS Kelso		11-1					OCs, VOCs	
_										
Other	Field Obs	ervations:								

		MON	ITORING	WELL/PIE	ZOMET	ER NU	MBER	ATT	-05		
Projec	t Name:	Former M	oppers F	<u>acility, Waun</u>	a, OR			i	<i>i</i> 1		
-				B M					12/145 12.(16.00 est ~3 April		
				WELL	_L INFORMATION						
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_	•			PURGING	G MEAS	UREMI	ENTS				
	Time	Water Level (ft btoc)	pH (std. units)	SC (ms/cm)	Temp.	ORP (mv)	Turbi dity (NTU)	DO (mg/L)	Notes		
	14:10		6,28		中华	-7.1		2.97			
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Water ORP/D Purge Sampli Purge Purge Averag Analyt	Sample ID No.: ATT-05- OHCAINS Nater 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: Sample Collection Time: Purging Method: peristaltic pump Average Purge Rate (mL/min): Purging Method: peristaltic pump Average Purge Rate (mL/min): Sample Containers Used: x40ml (HCl), x1L Analytical Lab: ALS Kelso Chemical Analyses: SVOCs, VOCs										

		MONI	TORING	WELL/PIE	ZOMET	ER NU	MBER	ATT-	06	
Project	: Name:	Former K	oppers Fa	acility, Waun	a, OR		Detai	ul:	2115	
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Project	Number	: <u>661M1323</u>	360.2018.1	3	VV	eather Co	mailions	Zni.	F 04	
Locatio	on: <u>vvaun</u>	<u>a, OR</u>			Wi	nd Snee	d/Directi	on: 45	w 1-3	
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				WELL	_ INFOR	OITAM	N			
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		-		PURGIN	G MEAS	UREMI	ENTS			
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	13:55	5,23	(0,31	184	11.19			0.13	£'2	
Ī	14:00	5,23	6.31	176	11.10	1.84	φ.9	0.13	lo	
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Sample	e ID No <u>.:</u>	ATT-0	3-0403 No: Soline	ts Aus	Dup-	04621	6			
		Model & No		a U-22 or equ	iivalent					
Purge	Equipme	nt Used:	perist	taltic pump			1 - 1 - 11 - 4			
Sampl	ing Equip	ment Use	d: perist	taltic pump, 2"	' diameter					
	Start Tim			13:30				ion Time	peristaltic pump	
		on Time:	min):	14:00 124M		Sample	g Metho e Contai	u. ners Use	d: x40ml (HCl), x1L	
		Rate (mL/r ALS Kelso		- 27/12		Chemi	cal Analy	yses: SV	OCs, SVOC's DUP, VOC	<u>s,</u>
Allalyt	iour Labi	110 11000				VOCs	DUP			
Other	Field Obs	servations:		Dun C	ellect	ed	w/5	Janol	٢	
J								1		

		MONI	TORING	WELL/PIE	ZOMET	ER NU	MBER	ATT	-10	
Projec	t Name:	<u>Former K</u>	oppers Fa	cility, Waun	a, OR		Date:	4(palie	
	t Number on: <u>Waun</u>		360.2018.E		Weather Conditions: P. Cleor					
Sampl	er:	1V6	Mc M		Wi	nd Spee	d/Direction	on:	west NI-3	· · ·
				WELI	LINFOR	MATIO	N			
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	14:45	<u> 5.38</u> 5.38	Lerlest	134	16.76	-29.1		φ.3) Φ.14	<u> </u>	
	14.56	5,30	6.49	194		-75:4		437		
	15,00	5.36	6.49	134		-10.3		φ.i2		
Water ORP/D Purge	O Meter I Equipme	. Model & N Nodel & No	Horiba perista	, 101 or equiv U-22 or equ ltic pump ltic pump, 2"	ivalent	disposab	le bailer			
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Other l	Field Obs	ervations:	ा ह	e so f	eronge.	0 60	ΘΛ	rofa	÷ 00	

	MONITORING WELL/PIEZOMETER NUMBERATT-11									
Projec	t Name:	<u>Former K</u>	oppers Fa	acility, Wauna	a, OR				Halim	
Duelee	4 Alumahan	. ee4M4999	260 2019 E		W	eather Co	Date: . anditions	<u>-</u>	2 clear	
	on: <u>Wauna</u>		000.2010.L	3						***************************************
Sampl	er:	JUE / W	المالما		W	ind Spee	d/Directi	on:	West Namply	
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I op oi Initial	Casing Diameter (in): Top of Casing Elevation (ft): Initial Depth to Water (ft): Casing Diameter (in): Depth of Well Casing (ft): Actual Purge Volume (gallons): Casing Diameter (in): Depth of Well Casing (ft): Actual Purge Volume (gallons):									
Wellhe	ad Condi	tion:	600						ite-	
				PURGING	G MEAS	SUREME	ENTS			
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	Time	Level (ft btoc)	(std. units)	SC (ms/cm)	Temp.	ORP (mv)	dity (NTU)	DO (mg/L)	Notes	
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			6.53	310		-15,5		0,25	₽· L ,	•
	1150		(0.26	229		-45		0.30	JL 3L	
		Co.32	626	<u> </u>		-21.8		4.26	3L	
	16:00:	6.32	(0,25)	22 &	10.9	~31 <u>,</u> 2		ゆ.33	46	
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Samni	e ID No.:	ATT-11	- ०५०२	18						
Water	Level Ind.	Model & N	lo.: <u>Solins</u>	t 101 or equiv						
		/lodel & No		a U-22 or egui altic <u>pump</u>	<u>ivalent</u>	 				
	Equipment ing Equip	nt Oseu: ment Used		altic pump, 2"	diameter	disposab	le bailer		With the second	
-	Start Time			17:40				ion Time:		
Purge	Completion	on Time:		1610b			g Method		peristaltic pump	
		R ate (mL/n ALS Kelso	nin):	124 M					I: <u>x40ml (HCl), x1L</u> DCs, VOCs	
•				1501 Laa)'6)'	_		o fer	
Other	riela Obs	ervations:	لح ٦٠	17811 CU	ETLIN YL	110 11	1 40	age v	, <u></u>	

	MONITORING WELL/PIEZOMETER NUMBERATT-12									
Projec	t Name:	Former K	Koppers Fa	acility, Wauna	<u>a, OR</u>			ul-	1.3	
				_			Date:	714	13	
-			<u>360.2018.E</u>	3	We	eather Co	onditions	s:1 <u>/</u> -	Geor	
	on: <u>Waun</u>									r Iva
Sampl	er: <u></u>	16 / W	1.J.M		Wi	nd Spee	d/Directi	on:	west asmal	13
	WELL INFORMATION									
Casing	g Diamete	r (in):	2	15		Ground	vater Ele	evation (f	t):	
Top of	Casing E	levation (f	t):	1		Depth o	f Well Ca	ising (ft):		
Casing Diameter (in): 2" Groundwater Elevation (ft): Depth of Well Casing (ft): Depth of Well Casing (ft): Actual Purge Volume (gallons) Wellhead Condition: 62 000							ilons): 44			
weim	au Conai	tion:	Con COC							
	PURGING MEASUREMENTS									
		Water	рН				Turbi			
		Level (ft	(std.	SC	Temp.	ORP	dity	DO (mg/l)	Notes	
	Time	btoc)	units)	(ms/cm)	(°C)	(mv)	(NTU)			-
	17:10	5,19	6.14	436		1316		1.54		
	17:15	5,19	6.13	360	1162		25	4,42		
	17:20	5.19	6,14	353	11.北人	<u>-123</u>	1.1	025	a L	-
	17:25	5,19	6.13	352	11,79	-12,7 -13.4	Q .9	\$132		
	17:30	5.19	6,14	352	11175	-17.0	Q.9	Ø-24	i i i i	_
							-			
	Sample ID No.: ATT-12- 으ょうしゅ									
		. Model & I Vlodel & No		<u>st 101 or equiv</u> a U-22 or equi						
- A	Equipme:			altic pump	valent					
		ment Use	4.2	altic pump, 2"	diameter	disposab	le bailer		4	
•	•			17·10				ion Time	17/30	
	Start Tim Completi			17:30			g Method		peristaltic pump	
		Rate (mL/r	nin):	124M					d: <u>x40ml (HCl), </u> >	(1L
		ALS Kelso				Chemical Analyses: SVOCs, VOCs				
•		ervations:								
			· · · · · · · · · · · · · · · · · · ·							

MONITORING WELL/PIEZOMETER NUMBER SBW-05 Project Name: Former Koppers Facility, Wauna, OR Weather Conditions: Project Number: 661M132360.2018.B Location: Wauna, OR Wind Speed/Direction: West ~ 3 mps Sampler: **WELL INFORMATION** Groundwater Elevation (ft): ___ Casing Diameter (in): Depth of Well Casing (ft): Top of Casing Elevation (ft): Initial Depth to Water (ft): Actual Purge Volume (gallons): Wellhead Condition: **PURGING MEASUREMENTS** Water рН Turbi Temp. ORP Level (ft (std. SC dity DO btoc) units) (ms/cm) (°C) (mv) (NTU) (mg/L) Notes Time 4.57 60.41 947 10081 Cell -18,4 40.3 4,62 950 14,69 40 6.41 946 10.73 -19.4 42.6 12:40 4.62 6.41 5 39.5 10:41 6.41 4.60 944 2.50 SBW-05- 040218 Sample ID No.: Water Level Ind. Model & No.: Solinst 101 or equivalent ORP/DO Meter Model & No.: Horiba U-22 or equivalent peristaltic pump Purge Equipment Used: peristaltic pump, 2" diameter disposable bailer Sampling Equipment Used: Sample Collection Time: _____ \ 2.5 0 **Purge Start Time:** Purging Method: peristaltic pump
Sample Containers Used: x40ml (HCI), x1L Purge Completion Time: Average Purge Rate (mL/min): Chemical Analyses: SVOCs, VOCs Analytical Lab: ALS Kelso Other Field Observations: Decade vice co

Updated10/30/09 Page 11 of 14

		MONI	TORING	WELL/PIE	ZOMET	ER NUN	IBER .	SBW	-07	
Projec	t Name:	Former K	oppers Fa	acility, Waun	a, OR		- /	1.3	9/12	
Locati	Project Name: Former Koppers Facility, Wauma, OK Project Number: 661M132360.2018.B Cocation: Wauma, OR Sampler: Wind Speed/Direction:									
	WELL INFORMATION									
Top of Initial	Casing Diameter (in): Top of Casing Elevation (ft): Initial Depth to Water (ft): Wellhead Condition: Casing Diameter (in): Depth of Well Casing (ft): Actual Purge Volume (gallons): Wellhead Condition:									_
				PURGIN	G MEAS	UREME	ENTS			
ole -	Time	Water Level (ft btoc)	pH (std. units)	SC (ms/cm)	Temp.	ORP (mv)	Turbi dity (NTU)	DO (mg/L)	Notes	
,ou	11:40	* 41-9-tol.	4.25	517		18.2			All	
	12:00	5.17	6.31	524	12,44	-25.7	3.0	0.43	15°	
	12110	5,17	10.51	524	12.46	-26.7	2.7	10.41	ÚL .	
		-								
		т.								
	1									
Water ORP/E Purge	Sample ID No.: SBW-07-040000 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 Purge Avera	Purge Start Time: Purge Completion Time: Average Purge Rate (mL/min): Analytical Lab: ALS Kelso Purge Start Time: Sample Collection Time: Purging Method: Purging Method: Sample Containers Used: Yalio Purging Method: Sample Containers Used: Yalio Purging Method: Sample Containers Used: Yalio Chemical Analyses: SVOCs, VOCs									
Other	Field Obs	servations:				-				

MONITORING WELL/PIEZOMETER NUMBER SBW-08 Former Koppers Facility, Wauna, OR Project Name: Date: Weather Conditions: _ Project Number: 661M132360.2018.B Location: Wauna, OR Wind Speed/Direction: Sampler: JVG-/ www. WELL INFORMATION Groundwater Elevation (ft): ____ Casing Diameter (in): Depth of Well Casing (ft): Top of Casing Elevation (ft): Actual Purge Volume (gallons): ____(al-Initial Depth to Water (ft): Liters Wellhead Condition: PURGING MEASUREMENTS рН Water Turbi SC ORP DO (std. Temp. dity Level (ft (mg/L)Notes (ms/cm) (°C) (mv) (NTU) units) Time btoc) 11,35 +87,2 5,91 0.53 2.65 124 2.6 CEY 10.35 +45.1 0.9 4.20 2.69 5,81 if 19 86 10.33 +44.0 0.9 1:25 2.69 5,80 11.20 SBW-09- 040218 Sample ID No.: Water Level Ind. Model & No.: Solinst 101 or equivalent ORP/DO Meter Model & No.: Horiba U-22 or equivalent Purge Equipment Used: peristaltic pump peristaltic pump, 2" diameter disposable bailer Sampling Equipment Used: Sample Collection Time: 11:30 Purge Start Time: Purging Method: peristaltic pump
Sample Containers Used: x40ml (HCl), x1L Purge Completion Time: Average Purge Rate (mL/min): 24M Chemical Analyses: SVOCs, VOCs Analytical Lab: ALS Kelso Other Field Observations:

, ,	MONITORING WELL/PIEZOMETER NUMBER PMW-07R										
Projec	t Name:	Former K	Coppers F	acility, Waun	a, OR			. 1	1.		
_						Date: $4/2/18$ Weather Conditions: $P.C.C.$					
Projec	t Number	: <u>661M132</u>	360.2018,I	B	W	eather Co	onditions	s:/	N. CIED		
Locati	on: <u>Waun</u> :	a, OR					1000 0				
Sampl	Sampler: Who / Will					nd Spee	d/Directi	on:	Jest Nelypa	—	
	WELL INFORMATION										
Casing	Groundwater Elevation (ft): Op of Casing Elevation (ft): Depth of Well Casing (ft): Actual Purge Volume (gallons):										
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Initial	Depth to \	Nater (ft):	40	13		Actual	urge vo	iume (gai	nons):4 <i>L</i>		
vveiine	aa conu	tion:	(500	,						_	
_				PURGING	G MEAS	UREM	ENTS				
		Water	рН	00	T	ODD	Turbi	DO			
!	Time	Level (ft btoc)	(std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	dity (NTU)	(mg/L)	Notes		
	Time			135	***************************************	-45.4		1.43	(ell .		
		4.94	(4.61 6.54			-6.0		4.74	(<u>e</u>);		
	16:50	<u>५,०३ </u>	(6.4) A	13(·-i4.3		6.13	24		
			Ce. 55		C3 (6)	-148	10	0.12	3		
	17:00		1 616	131	0 133	-14.7	THE CA	0.12	- 4		
	13.00	5,02	6.91	171		4	Ψ."	1.4.10	"		
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Sampl	e ID No <u>.:</u>	PMW	-07- 04	0218							
Water	Level Ind.	. Model & I	No.: Solins	st 101 or equiv							
		vlodel & No		a U-22 or equ	<u>ivalent</u>						
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•				,:45	GIGHTIOCOL			ion Time:	17:05		
	Start Tim Completi			\u\s	·····		g Method		peristaltic pump	—	
		Rate (mL/n	,	.24//		Sample	Contair	iers Used	i: x40ml (HCl), x1L		
		ALS Kelso				Chemi	cal Analy	ses: <u>SV</u>	OCs, VOCs, MNA		
Othor	Field Ohe	ervations:	ام	oronge	1000	V Der	500	i			
omer	Liein Ons	CI VALIDIIS,		<u> </u>	· / · · · /	* I	. 10-	·		_	
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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).

Sample ID/	Analyte	Primary Result	Duplicate Result	RL	RPD
Field Duplicate ID		(µg/L)	(µg/L)	(µg/L)	%
ATT06-040218 and	Dibenzofuran	1.7	2.6	1.0	42%
DUP-040218	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 Naphthalene Phenanthrene	4.9 J 36 J 2.6 J	FD FD FD
ATT10-040218	Dibenzofuran	0.087 J	DL
ATT01-040218	Dibenzofuran Phenanthrene	0.14 J 0.087 J	DL DL
ATT03-040218	Phenanthrene	0.066 J	DL
ATT12-040218	Naphthalene	0.17 J	DL
DUP-040218	Fluorene Naphthalene Phenanthrene	7.9 J 82 J 4.3 J	FD FD 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