**SENT VIA E-MAIL**

July 11, 2016
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: Quarterly 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 quarterly 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 second quarter of 2016: April 1, 2016, through June 30, 2016.

## ACTIONS TAKEN DURING PREVIOUS THREE MONTHS

- Following the May 27, 2016, approval by DEQ of the Final Report: Monitored Natural Attenuation Demonstration, the aeration trench was shut down on June 13, 2016. The monitored natural attenuation (MNA) plan outlined in this report will be implemented at the Site, which included semiannual and annual reporting and semiannual groundwater monitoring.
- Prior to shut down, biweekly inspections and maintenance of the aeration trench system were performed in general accordance with the Operation, Monitoring, Inspection, and Maintenance Plan (O&M Plan) approved by DEQ. The operating factor of the aeration system for the second quarter, prior to shutdown, was 89 percent, as described in more detail in the attached Quarterly Operation, Monitoring, and Maintenance Summary.
- The shoreline and seeps along the Columbia River were inspected bi-weekly, including along the region where a sheen was identified in June 2015. No sheen or odor was detected during any of these inspections.
- Groundwater elevations were measured during the semiannual monitoring event in April 2016 and a groundwater elevation contour map was prepared.
- Semiannual groundwater quality monitoring was performed in April 2016.

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- The Annual Cap Inspection was performed in April 2016. During the inspection, animal burrows were noted in the protective soil cap. These burrows were filled and the repairs and repairs are described in more detail in the attached Quarterly Operation, Monitoring, and Maintenance Summary.

## ACTIONS SCHEDULED TO BE TAKEN IN THE NEXT FOUR MONTHS

- An updated Operations, Monitoring Inspection, and Maintenance Plan will be prepared to address the changes in operation outlined in the *Final Report: Monitored Natural Attenuation Demonstration* and the approved MNA plan.
- In accordance with the approved MNA plan, quarterly reports will no longer be provided to DEQ. Instead, semiannual and annual reports will be provided. The next scheduled report will be the 2016 Annual Report.

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

- Two power outages occurred at the GP mill, causing the air compressor to shut down; the system was restarted during the following biweekly Site visit.

## 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 2016 semiannual groundwater monitoring. These data, along with groundwater level measurements, are tabulated in the 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): Quarterly Operation, Monitoring, and Maintenance Summary
cc: M. Hassett, Georgia-Pacific
S. Johnson, Georgia Pacific
K. Paschl, Beazer East, Inc.

**ATTACHMENTS**

**Memorandum**

| | | | |
|---|---|---|---|
| To | Kurt Paschl<br>Beazer East, Inc. | Project No. | 661M13236 |
| | | cc: | Michael Hassett, GP<br>Shannon Johnson, GP<br>Jeff Sorensen, GP<br>Project File |
| From | Steve Barnett<br>Melissa Roskamp<br><br>Amec Foster Wheeler Environment & Infrastructure, Inc. | | |
| Date | July 8, 2016 | | |
| **Subject** | **Quarterly Operation, Monitoring, and Maintenance Summary, Second Quarter 2016: April 1, 2016, through June 30, 2016**<br>Former Koppers Facility<br>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 second quarter of 2016, from April 1, 2016 through June 30, 2016. 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 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. Prior to shutdown, biweekly inspections of the aeration trench system and biweekly readings of dissolved oxygen and pH were taken in aeration trench wells ATT-07, ATT-08, and ATT-09, in general accordance with the O&M Plan. Copies of the biweekly inspection forms are included in Attachment 1. Two shutdowns occurred, both due to loss of power at the GP mill. The operating factor for the system for the second quarter, prior to shutdown, was 89 percent. No planned maintenance shutdowns of the aeration system occurred during the second quarter.

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## MAINTENANCE

On April 20, 2016, the Annual Cap Inspection was performed. During the inspection, two animal burrows were noted in the protective soil cap. These burrows were filled and the cap repaired. A copy of the annual inspection form is included in Attachment 1 and a photograph log of the burrows and repaired cap is included as Attachment 2.

## SEMIANNUAL GROUNDWATER MONITORING

The first 2016 semiannual groundwater monitoring event was conducted on April 7, 2016. Groundwater level readings were taken on April 7, 2016, 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 3. Monitoring results for the point-of-compliance wells were all well below the Level II screening level values. Water quality parameter field measurements taken during sampling are presented in Table 3.

Attachments:

| | |
|---|---|
| Table 1: | April 7, 2016, Groundwater Elevations |
| Table 2: | April 2016 Groundwater Monitoring Analytical Results |
| Figure 1: | Groundwater Elevations |
| Attachment 1: | Bi-Weekly Inspection Forms |
| Attachment 2: | Cap Repair Photograph Log |
| Attachment 3: | Groundwater Sampling Logs |

**TABLE 1**

**APRIL 7, 2016 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 | 11:20 | 10.26 | 12.31 | 4.76 | 2.71 | 7.55 |
| ATT-02 | 11:23 | 12.69 | 15.21 | 7.38 | 4.86 | 7.83 |
| ATT-03 | 11:30 | 11.51 | 14.06 | 6.32 | 3.77 | 7.74 |
| ATT-04 | 11:36 | 10.54 | 12.73 | 5.38 | 3.19 | 7.35 |
| ATT-05 | 11:10 | 12.43 | 14.37 | 6.17 | 4.23 | 8.20 |
| ATT-06 | 10:25 | 11.98 | 14.11 | 6.01 | 3.88 | 8.10 |
| ATT-10 | 11:14 | 10.42 | 12.57 | 4.28 | 2.13 | 8.29 |
| ATT-11 | 11:47 | 12.21 | 13.88 | 6.60 | 4.93 | 7.28 |
| ATT-12 | 11:41 | 9.34 | 11.27 | 5.09 | 3.16 | 6.18 |
| PMW-2 | 8:40 | 9.18 | 11.62 | 2.59 | 0.15 | 9.03 |
| PMW-5 | 8:43 | 12.72 | 12.33 | 2.80 | 3.19 | 9.53 |
| PMW-6 | 8:57 | 9.38 | 9.28 | 0.32 | 0.42 | 8.96 |
| PMW-7R | 11:38 | 9.28 | 11.82 | 5.17 | 3.50 | 9.50 |
| PMW-13 | 10:11 | 11.21 | 13.54 | 5.05 | 2.72 | 8.49 |
| SBW-01 | 10:01 | 10.25 | 12.35 | 7.30 | 5.20 | 5.05 |
| SBW-02 | 9:56 | 10.29 | 12.71 | 3.77 | 1.35 | 8.94 |
| SBW-03 | 8:14 | 10.65 | 10.06 | 6.09 | 6.68 | 3.97 |
| SBW-04 | 8:20 | 11.29 | 10.87 | 4.72 | 5.14 | 6.15 |
| SBW-05 | 9:45 | 10.42 | 10.06 | 4.30 | 4.66 | 5.76 |
| SBW-06 | 8:33 | 11.42 | 11.02 | 1.60 | 2.00 | 9.42 |
| SBW-07 | 9:10 | 10.86 | 10.51 | 4.88 | 5.23 | 5.63 |
| SBW-08 | 8:30 | 9.37 | 8.85 | 3.30 | 3.82 | 5.55 |
| SBW-09 | 10:05 | 10.65 | 12.85 | 7.97 | 5.77 | 4.88 |
| SBW-10 | 10:07 | 10.85 | 12.91 | 4.55 | 2.49 | 8.36 |

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 2016 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] | ATT-06[3] | Level II SLV (µg/L)[4] |
|---|---|---|---|---|---|---|---|---|
| Date | 04/07/2016 | 04/07/2016 | 04/07/2016 | 04/07/2016 | 04/07/2016 | 04/07/2016 | 04/07/2016 | |
| Ethylbenzene | **7.5** | 1.6 | 0.050 U | 0.050 U | 5.7 | **8.5** | 6.4 | 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 | 1.9 J | 1.4 J | 1.3 J | 2.3 J | 1.1 U | 1.1 U | 42 |
| Naphthalene | 160 D | 170 D | 0.022 U | 0.022 U | 250 D | 110 D | 110 D | 620 |
| Dibenzofuran | 0.16 J | 0.65 | 0.018 U | 0.018 U | **8.5** | 2.3 | 2.2 | 3.7 |
| Fluorene | 0.88 | 5.1 | 0.027 U | 0.027 U | **11** | **9.2** | **8.6** | 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 | 0.025 J | 1.1 | 0.022 U | 0.022 U | 2.8 | 3.9 | 3.7 | 6.3 |
| Fluoranthene | 0.020 U | 0.020 U | 0.020 U | 0.020 U | 0.020 U | 0.029 J | 0.026 J | 6.2 |
| bis(2-Ethylhexyl) phthalate | 0.13 U | 0.15 J | 0.57 J | 0.13 U | 0.13 U | 0.13 U | 0.13 U | 3 |

## TABLE 2

## APRIL 2016 GROUNDWATER MONITORING ANALYTICAL RESULTS [1,2]

Former Koppers Facility
Wauna, Oregon

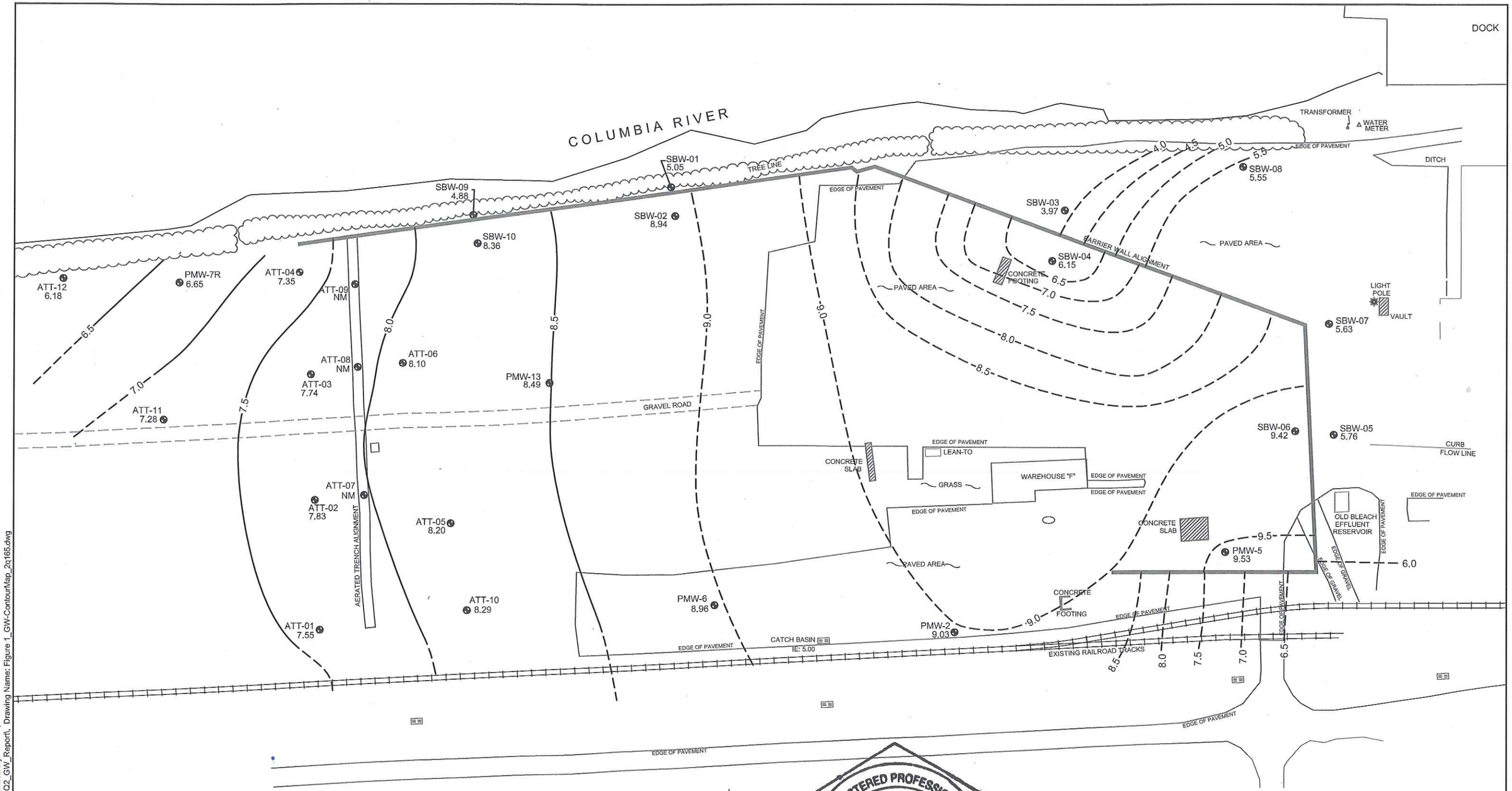
Concentrations are in micrograms per liter (µg/L)

| Constituent | ATT-10[3] | ATT-11 | ATT-12 | PMW-7R | SBW-05 | SBW-07 | SBW-08 | Level II SLV (µg/L)[4] |
|---|---|---|---|---|---|---|---|---|
| Date | 04/07/2016 | 04/07/2016 | 04/07/2016 | 04/07/2016 | 04/07/2016 | 04/07/2016 | 04/07/2016 | |
| Ethylbenzene | 0.080 J | 0.34 J | 0.050 J | 0.050 U | 0.080 J | 0.050 U | 0.050 U | 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 | 1.6 J | 2.0 J | 2.2 J | 1.3 J | 1.4 J | 1.6 J | 42 |
| Naphthalene | 1.8 | 13 | 0.022 U | 0.022 U | 1.1 | 0.022 U | 0.022 U | 620 |
| Dibenzofuran | 0.16 J | 0.018 U | 0.018 U | 0.018 U | 0.018 U | 0.018 U | 0.018 U | 3.7 |
| Fluorene | 4.1 | 0.027 U | 0.027 U | 0.027 U | 2.8 | 0.027 U | 0.027 U | 3.9 |
| Pentachlorophenol | 0.34 U | 0.34 U | 0.34 U | 0.34 U | 0.56 J | 0.34 U | 0.34 U | 15 |
| Phenanthrene | 0.59 | 0.022 U | 0.022 U | 0.022 U | 0.081 J | 0.022 U | 0.022 U | 6.3 |
| Fluoranthene | 0.020 U | 0.020 U | 0.020 U | 0.020 U | 0.020 U | 0.020 U | 0.020 U | 6.2 |
| bis(2-Ethylhexyl) phthalate | 0.13 U | 0.16 J | 0.13 U | 0.25 J | 0.13 U | 0.46 J | 0.38 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




## 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.

PLANT NORTH

0 50 100

APPROXIMATE SCALE IN FEET

PLANT NORTH IS ROTATED 45° CLOCKWISE FROM TRUE NORTH

REGISTERED PROFESSIONAL OREGON J. STEPHEN BARNETT G 1261 GEOLOGIST

amec foster wheeler

# GROUNDWATER ELEVATIONS
APRIL 7, 2016
Former Koppers Facility
Wauna, Oregon

| By: PM | Date: 07/11/16 | Project No. 09151 |
|---|---|---|
| Amec Foster Wheeler Environment & Infrastructure, Inc. | | Figure 1 |

Plot Date: 07/11/16 - 4:53pm, Plotted by: patrick.mccarthy
Drawing Path: K:\13000\132001\32361\DWG\2016Q2_GW_Report\, Drawing Name: Figure 1_GW-ContourMap_2q16S.dwg

## Aeration Trench Inspection Form

Groundwater Seeps Interim Remedial Measure
Former Koppers Facility Wauna, Oregon

| Date/Time | System Status (On/Off) | High Pressure Light (On/Off) | Low Pressure Light (On/Off) | PI-1 Pressure (psi) | PI-2 Pressure (psi) | T1 Temp. (° F) | Bleeder Valve Flow (scfm) | FI-1 System Flow (in. $H_20$) | FI-1 System Flow (cfm) | Run Time Meter ( hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| 4-7-16 13:30 | ON | OFF | OFF | 13.75 | 13.75 | 128 | 0.0 | 4.85 | NA | 7862.7 |
| 18:00 | ON | OFF | OFF | 13,75 | 13.75 | 115 | 0.0 | 4.77 | NA | 7867.2 |

| Chart Recorder Flow (cfm) | Change Circle Chart (Yes/No) | Sparge Zone 1 | | Sparge Zone 2 | | Sparge Zone 3 | | Sparge Zone 4 | | Sparge Zone 5 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | PI-Z1 Pressure (psi) | FI-Z1 Flow (cfm) | PI-Z2 Pressure (psi) | FI-Z2 Flow (cfm) | PI-Z3 Pressure (psi) | FI-Z3 Flow (cfm) | PI-Z4 Pressure (psi) | FI-Z4 Flow (cfm) | PI-Z5 Pressure (psi) | FI-Z5 Flow (cfm) |
| 4.85 | YES | 8.75 | 1.9 | 7.0 | 1.5 | 12.75 | 1.8 | 13.5 | 0.8 | 6.5 | 1.9 |
| 4.77 | | 8.7 | 1.9 | 7.0 | 1.4 | 13.0 | 1,8 | 13.5 | 1.0 | 6.75 | 1.8 |

| Sparge Zone 6 | | Sparge Zone 7 | | Sparge Zone 8 | | Sparge Zone 9 | | Sparge Zone 10 | | Sparge Zone 11 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PI-Z6 Pressure (psi) | FI-Z6 Flow (cfm) | PI-Z7 Pressure (psi) | FI-Z7 Flow (cfm) | PI-Z8 Pressure (psi) | FI-Z8 Flow (cfm) | PI-Z9 Pressure (psi) | FI-Z9 Flow (cfm) | PI-Z10 Pressure (psi) | FI-Z10 Flow (cfm) | PI-Z11 Pressure (psi) | FI-Z11 Flow (cfm) |
| 13.5 | 1.0 | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF |
| 13.5 | 1.0 | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF |

| | ATT-07 | ATT-08 | ATT-09 |
|---|---|---|---|
| Well Depth (ft BTOC) | 15 | 14.5 | 13.5 |
| Water Level (ft BTOC) | 6.64 | 6.06 | 4.73 |
| Center of Water Column (ft BTOC) | 10.82 | 10.03 | 9.12 |

| | ATT-07 | ATT-08 | ATT-09 |
|---|---|---|---|
| pH | 6.55 | 7.20 | 7.33 |
| DO (mg/l) | 0.77 | 7.99 | 8.21 |
| Depth Measured (ft BTOC) | 10.82 | 10.03 | 9.12 |

**Name :**
**William J. McFarland Senior Environmental Technician**
**Amec Foster Wheeler**
**7376 SW Durham Road**
**Portland, Oregon 97224**

**Signature:**

**Signature:**

**Site inspection performed (yes/no)**

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## Aeration Trench Inspection Form

Groundwater Seeps Interim Remedial Measure
Former Koppers Facility Wauna, Oregon

| Maintenance Issue | | | Maintenance Issue Resolution | | |
|---|---|---|---|---|---|
| Name | Date/Time | Description | Name | Date/Time | Description |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Name :** **Signature:** **Site inspection performed (yes/no)**

**William J. McFarland Senior Environmental Technician**
**Amec Foster Wheeler**
**7376 SW Durham Road**
**Portland, Oregon 97224** **Signature:**

## Aeration Trench Inspection Form

Groundwater Seeps Interim Remedial Measure
Former Koppers Facility Wauna, Oregon

| Date/Time | System Status (On/Off) | High Pressure Light (On/Off) | Low Pressure Light (On/Off) | PI-1 Pressure (psi) | PI-2 Pressure (psi) | T1 Temp. (° F) | Bleeder Valve Flow (scfm) | FI-1 System Flow (in. $H_20$) | FI-1 System Flow (cfm) | Run Time Meter ( hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| 4-20-16 13:30 | OFF | OFF | ON | OFF | OFF | 68 | 0.0 | OFF | OFF | 8110.1 |
| 15:30 | ON | OFF | OFF | 15.0 | 15.0 | 115 | 0.0 | 1.5 | 4.52 | 8113.2 |

| Chart Recorder Flow (cfm) | Change Circle Chart (Yes/No) | Sparge Zone 1 | | Sparge Zone 2 | | Sparge Zone 3 | | Sparge Zone 4 | | Sparge Zone 5 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | PI-Z1 Pressure (psi) | FI-Z1 Flow (cfm) | PI-Z2 Pressure (psi) | FI-Z2 Flow (cfm) | PI-Z3 Pressure (psi) | FI-Z3 Flow (cfm) | PI-Z4 Pressure (psi) | FI-Z4 Flow (cfm) | PI-Z5 Pressure (psi) | FI-Z5 Flow (cfm) |
| OFF | YES | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF |
| 4.52 | | 8.25 | 1.8 | 6.25 | 1.4 | 13.0 | 1.2 | 15.0 | 1.0 | 7.5 | 2.0 |

| Sparge Zone 6 | | Sparge Zone 7 | | Sparge Zone 8 | | Sparge Zone 9 | | Sparge Zone 10 | | Sparge Zone 11 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PI-Z6 Pressure (psi) | FI-Z6 Flow (cfm) | PI-Z7 Pressure (psi) | FI-Z7 Flow (cfm) | PI-Z8 Pressure (psi) | FI-Z8 Flow (cfm) | PI-Z9 Pressure (psi) | FI-Z9 Flow (cfm) | PI-Z10 Pressure (psi) | FI-Z10 Flow (cfm) | PI-Z11 Pressure (psi) | FI-Z11 Flow (cfm) |
| OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF |
| 15.0 | 1.4 | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF |

| | ATT-07 | ATT-08 | ATT-09 |
|---|---|---|---|
| Well Depth (ft BTOC) | 15 | 14.5 | 13.5 |
| Water Level (ft BTOC) | 7.08 | 6.53 | 5.20 |
| Center of Water Column (ft BTOC) | 11.04 | 10.51 | 9.35 |

| | ATT-07 | ATT-08 | ATT-09 |
|---|---|---|---|
| pH | 6.21 | 6.77 | 6.11 |
| DO (mg/l) | 0.38 | 5.44 | 4.73 |
| Depth Measured (ft BTOC) | 11.04 | 10.51 | 9.35 |

**Name :**
**William J. McFarland Senior Environmental Technician**
**Amec Foster Wheeler**
**7376 SW Durham Road**
**Portland, Oregon 97224**

**Signature:**

**Signature:**

**Site inspection performed (yes/no)**

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## Aeration Trench Inspection Form

Groundwater Seeps Interim Remedial Measure
Former Koppers Facility Wauna, Oregon

| Maintenance Issue | | | Maintenance Issue Resolution | | |
|---|---|---|---|---|---|
| **Name** | **Date/Time** | **Description** | **Name** | **Date/Time** | **Description** |
| Bill McFarland | 4-20-16 13:30 | System off on arrival. Mill maintenance is suspected cause for system off | Bill McFarland | 4-20-16 13:30 | Started system |
| Bill McFarland | 4-20-16 13:30 | Circle chart pen dried out | Bill McFarland | 4-20-16 13:30 | Replaced pen |
| Bill McFarland | 4-20-16 13:30 | Compressor oil scheduled change | Bill McFarland | 4-20-16 13:30 | Changed compressor oil |
| Bill McFarland | 4-20-16 13:30 | Low flow to sparge line #4 | Bill McFarland | 4-20-16 13:30 | Spent time forcing air into sparge line #4. Reduced flow to sparge lines#1&2 to increase flow to sparge line #4 |
| | | | | | |

**Name :** **Signature:** **Site inspection performed (yes/no)**

**William J. McFarland Senior Environmental Technician**
**Amec Foster Wheeler**
**7376 SW Durham Road**
**Portland, Oregon 97224** **Signature:**

**TABLE 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** |
| Bill McFarland | 4/20/16 | Annual Cap Inspection Completed | | | |
| Bill McFarland | 4/20/16 | 2 Animal burrow near PMW 13 | Bill McFarland | 4/20/16 | Located, Logged, Photographed & Reported |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Signature:** [signature]

**Site inspection performed (yes/no)**

**TABLE 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** |
| Bill McFarland | 4/20/16 | Annual Cap Inspection Completed | | | |
| Bill McFarland | 4/20/16 | 2 Animal burrow near PMW 13 | Bill McFarland | 4/20/16 | Located, Logged, Photographed & Reported |
| Jason Gardner | 5/18/16 | burrows near PMW 13 | Jason Gardner | 5/18/16 | Filled holes |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Signature:** [signature]

**Site inspection performed (yes/no)**

## Aeration Trench Inspection Form

Groundwater Seeps Interim Remedial Measure
Former Koppers Facility Wauna, Oregon

| Date/Time | System Status (On/Off) | High Pressure Light (On/Off) | Low Pressure Light (On/Off) | PI-1 Pressure (psi) | PI-2 Pressure (psi) | T1 Temp. (° F) | Bleeder Valve Flow (scfm) | FI-1 System Flow (in. $H_20$) | FI-1 System Flow (cfm) | Run Time Meter ( hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| 5-2-2016 14:00 | Off | Off | Off | Off | Off | 70 | na | Na | Na | 8391.3 |
| 16:00 | Off | Off | Off | Off | Off | 70 | Na | na | na | 8391.3 |

| Chart Recorder Flow (cfm) | Change Circle Chart (Yes/No) | Sparge Zone 1 | | Sparge Zone 2 | | Sparge Zone 3 | | Sparge Zone 4 | | Sparge Zone 5 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | PI-Z1 Pressure (psi) | FI-Z1 Flow (cfm) | PI-Z2 Pressure (psi) | FI-Z2 Flow (cfm) | PI-Z3 Pressure (psi) | FI-Z3 Flow (cfm) | PI-Z4 Pressure (psi) | FI-Z4 Flow (cfm) | PI-Z5 Pressure (psi) | FI-Z5 Flow (cfm) |
| 0 | Yes | Off | off | Off | Off | Off | Off | Off | Off | Off | Off |
| 0 | Yes | Off | off | Off | Off | Off | Off | Off | Off | Off | Off |

| Sparge Zone 6 | | Sparge Zone 7 | | Sparge Zone 8 | | Sparge Zone 9 | | Sparge Zone 10 | | Sparge Zone 11 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PI-Z6 Pressure (psi) | FI-Z6 Flow (cfm) | PI-Z7 Pressure (psi) | FI-Z7 Flow (cfm) | PI-Z8 Pressure (psi) | FI-Z8 Flow (cfm) | PI-Z9 Pressure (psi) | FI-Z9 Flow (cfm) | PI-Z10 Pressure (psi) | FI-Z10 Flow (cfm) | PI-Z11 Pressure (psi) | FI-Z11 Flow (cfm) |
| Off | Off | Off | off | Off | Off | Off | Off | Off | Off | Off | Off |
| Off | off | Off | Off | Off | Off | Off | Off | Off | Off | Off | Off |

| | ATT-07 | ATT-08 | ATT-09 |
|---|---|---|---|
| Well Depth (ft BTOC) | 15 | 14.5 | 13.5 |
| Water Level (ft BTOC) | 7.31 | 6.76 | 5.43 |
| Center of Water Column (ft BTOC) | 11.15 | 10.63 | 9.46 |

| | ATT-07 | ATT-08 | ATT-09 |
|---|---|---|---|
| pH | 6.72 | 6.90 | 6.83 |
| DO (mg/l) | 0.21 | 3.26 | 5.29 |
| Depth Measured (ft BTOC) | 11.15 | 10.63 | 9.46 |

**Name :**
**Jason Gardner Chief Environmental Technician**
**Amec Foster Wheeler**
**7376 SW Durham Road**
**Portland, Oregon 97224** **Signature:**

**Signature:**

**Site inspection performed (yes/no)**

C:\Users\jason.gardner\Documents\Wauna\Wauna 2016\Wauna 5-2-2016.docx

## Aeration Trench Inspection Form

Groundwater Seeps Interim Remedial Measure
Former Koppers Facility Wauna, Oregon

| Maintenance Issue | | | Maintenance Issue Resolution | | |
|---|---|---|---|---|---|
| **Name** | **Date/Time** | **Description** | **Name** | **Date/Time** | **Description** |
| Jason Gardner | 5/2/2016 | Checked for sheen at seeps along Columbia river where it had been noted. Water was low and seep was exposed. | Jason Gardner | 5/2/2016 | No sheen or odor was detected. |
| Jason Gardner | 5/2/2016 | Power was off due to annual week long facility outage. | | | |
| Jason Gardner | 5/2/2016 | Animal burrows in cap area. | Jason Gardner | 5/2/2016 | Filled ones along Columbia and near facility well. |
| | | | | | |
| | | | | | |

**Name :**
**Jason Gardner Chief Environmental Technician**
**Amec Foster Wheeler**
**7376 SW Durham Road**
**Portland, Oregon 97224**

**Signature:**

**Signature:**

**Site inspection performed (yes/no)**

C:\Users\jason.gardner\Documents\Wauna\Wauna 2016\Wauna 5-2-2016.docx

## Aeration Trench Inspection Form

Groundwater Seeps Interim Remedial Measure
Former Koppers Facility Wauna, Oregon

| Date/Time | System Status (On/Off) | High Pressure Light (On/Off) | Low Pressure Light (On/Off) | PI-1 Pressure (psi) | PI-2 Pressure (psi) | T1 Temp. (° F) | Bleeder Valve Flow (scfm) | FI-1 System Flow (in. $H_20$) | FI-1 System Flow (cfm) | Run Time Meter ( hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| 5-18-2016 14:30 | Off | Off | Off | Off | Off | 70 | na | Na | Na | 8391.4 |
| 17:00 | On | Off | Off | 16.0 | 16.0 | 89 | Na | na | na | 8393.9 |

| Chart Recorder Flow (cfm) | Change Circle Chart (Yes/No) | Sparge Zone 1 | | Sparge Zone 2 | | Sparge Zone 3 | | Sparge Zone 4 | | Sparge Zone 5 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | PI-Z1 Pressure (psi) | FI-Z1 Flow (cfm) | PI-Z2 Pressure (psi) | FI-Z2 Flow (cfm) | PI-Z3 Pressure (psi) | FI-Z3 Flow (cfm) | PI-Z4 Pressure (psi) | FI-Z4 Flow (cfm) | PI-Z5 Pressure (psi) | FI-Z5 Flow (cfm) |
| 0 | no | Off | off | Off | Off | Off | Off | Off | Off | Off | Off |
| 4.35 | no | 9.5 | 1.8 | 7.5 | 1.8 | 15.5 | 1.8 | 16.0 | 0.44 | 5.5 | 1.8 |

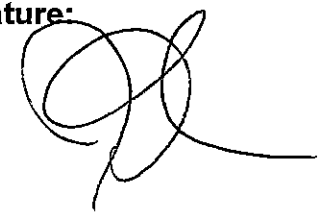
| Sparge Zone 6 | | Sparge Zone 7 | | Sparge Zone 8 | | Sparge Zone 9 | | Sparge Zone 10 | | Sparge Zone 11 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PI-Z6 Pressure (psi) | FI-Z6 Flow (cfm) | PI-Z7 Pressure (psi) | FI-Z7 Flow (cfm) | PI-Z8 Pressure (psi) | FI-Z8 Flow (cfm) | PI-Z9 Pressure (psi) | FI-Z9 Flow (cfm) | PI-Z10 Pressure (psi) | FI-Z10 Flow (cfm) | PI-Z11 Pressure (psi) | FI-Z11 Flow (cfm) |
| Off | Off | Off | off | Off | Off | Off | Off | Off | Off | Off | Off |
| 16.0 | 1.0 | Off | Off | Off | Off | Off | Off | Off | Off | Off | Off |

| | ATT-07 | ATT-08 | ATT-09 |
|---|---|---|---|
| Well Depth (ft BTOC) | 15 | 14.5 | 13.5 |
| Water Level (ft BTOC) | 7.46 | 6.87 | 5.60 |
| Center of Water Column (ft BTOC) | 11.23 | 10.68 | 9.55 |

| | ATT-07 | ATT-08 | ATT-09 |
|---|---|---|---|
| pH | 6.84 | 6.93 | 6.87 |
| DO (mg/l) | 0.18 | 1.27 | 3.46 |
| Depth Measured (ft BTOC) | 11.23 | 10.68 | 9.55 |

**Name :**
**Jason Gardner Chief Environmental Technician**
**Amec Foster Wheeler**
**7376 SW Durham Road**
**Portland, Oregon 97224** **Signature:**
C:\Users\jason.gardner\Documents\Wauna\Wauna 2016\Wauna 5-18-2016.docx

**Signature:**



**Site inspection performed (yes/no)**

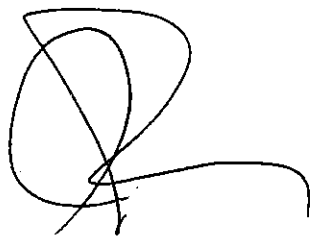
## Aeration Trench Inspection Form

Groundwater Seeps Interim Remedial Measure
Former Koppers Facility Wauna, Oregon

| Maintenance Issue | | | Maintenance Issue Resolution | | |
|---|---|---|---|---|---|
| **Name** | **Date/Time** | **Description** | **Name** | **Date/Time** | **Description** |
| Jason Gardner | 5/18/2016 | Checked for sheen at seeps along Columbia river where it had been noted. Water was low and seep was exposed. | Jason Gardner | 5/18/2016 | No sheen or odor was detected. |
| Jason Gardner | 5/18/2016 | Power was off due to annual week long facility outage. | | | Power to treatment compound reestablished during visit. |
| Jason Gardner | 5/18/2016 | Animal burrows in cap area. | Jason Gardner | 5/18/2016 | Filled ones along Columbia and near facility well. Took pictures. |
| | | | | | |
| | | | | | |

**Name :**
**Jason Gardner Chief Environmental Technician**
**Amec Foster Wheeler**
**7376 SW Durham Road**
**Portland, Oregon 97224**

**Signature:**



**Site inspection performed (yes/no)**

**Signature:**

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## Aeration Trench Inspection Form

Groundwater Seeps Interim Remedial Measure
Former Koppers Facility Wauna, Oregon

| Date/Time | System Status (On/Off) | High Pressure Light (On/Off) | Low Pressure Light (On/Off) | PI-1 Pressure (psi) | PI-2 Pressure (psi) | T1 Temp. (° F) | Bleeder Valve Flow (scfm) | FI-1 System Flow (in. $H_20$) | FI-1 System Flow (cfm) | Run Time Meter ( hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| 5-31-2016 16:30 | On | Off | Off | 14.5 | 14.5 | 138 | na | Na | Na | 8704.5 |
| 17:30 | On | Off | Off | 115.0 | 15.0 | 138 | Na | na | na | 8706.4 |

| Chart Recorder Flow (cfm) | Change Circle Chart (Yes/No) | Sparge Zone 1 | | Sparge Zone 2 | | Sparge Zone 3 | | Sparge Zone 4 | | Sparge Zone 5 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | PI-Z1 Pressure (psi) | FI-Z1 Flow (cfm) | PI-Z2 Pressure (psi) | FI-Z2 Flow (cfm) | PI-Z3 Pressure (psi) | FI-Z3 Flow (cfm) | PI-Z4 Pressure (psi) | FI-Z4 Flow (cfm) | PI-Z5 Pressure (psi) | FI-Z5 Flow (cfm) |
| 4.64 | Yes | 7.25 | 1.6 | 6.5 | 1.6 | 13.5 | 2.2 | 14.0 | 0.60 | 5.0 | 1.6 |
| 4.47 | Yes | 7.25 | 1.6 | 6.5 | 1.6 | 12.25 | 1.6 | 14.5 | 0.8 | 5.25 | 1.6 |

| Sparge Zone 6 | | Sparge Zone 7 | | Sparge Zone 8 | | Sparge Zone 9 | | Sparge Zone 10 | | Sparge Zone 11 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PI-Z6 Pressure (psi) | FI-Z6 Flow (cfm) | PI-Z7 Pressure (psi) | FI-Z7 Flow (cfm) | PI-Z8 Pressure (psi) | FI-Z8 Flow (cfm) | PI-Z9 Pressure (psi) | FI-Z9 Flow (cfm) | PI-Z10 Pressure (psi) | FI-Z10 Flow (cfm) | PI-Z11 Pressure (psi) | FI-Z11 Flow (cfm) |
| Off | Off | Off | off | Off | Off | Off | Off | Off | Off | Off | Off |
| 14.5 | 1.2 | Off | Off | Off | Off | Off | Off | Off | Off | Off | Off |

| | ATT-07 | ATT-08 | ATT-09 |
|---|---|---|---|
| Well Depth (ft BTOC) | 15 | 14.5 | 13.5 |
| Water Level (ft BTOC) | 7.85 | 7.29 | 5.97 |
| Center of Water Column (ft BTOC) | 11.42 | 10.89 | 9.73 |

| | ATT-07 | ATT-08 | ATT-09 |
|---|---|---|---|
| pH | 6.79 | 6.93 | 6.90 |
| DO (mg/l) | 0.26 | 2.46 | 3.05 |
| Depth Measured (ft BTOC) | 11.42 | 10.89 | 9.73 |

**Name :**
**Jason Gardner Chief Environmental Technician**
**Amec Foster Wheeler**
**7376 SW Durham Road**
**Portland, Oregon 97224**

**Signature:**

**Site inspection performed (yes/no)**

**Signature:**

C:\Users\jason.gardner\Documents\Wauna\Wauna 2016\Wauna 5-31-2016.docx

## Aeration Trench Inspection Form

Groundwater Seeps Interim Remedial Measure
Former Koppers Facility Wauna, Oregon

| Maintenance Issue | | | Maintenance Issue Resolution | | |
|---|---|---|---|---|---|
| **Name** | **Date/Time** | **Description** | **Name** | **Date/Time** | **Description** |
| Jason Gardner | 5/31/2016 | Checked for sheen at seeps along Columbia river where it had been noted. Water was low and seep was exposed. | Jason Gardner | 5/31/2016 | No sheen or odor was detected. |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Name :**
**Jason Gardner Chief Environmental Technician**
**Amec Foster Wheeler**
**7376 SW Durham Road**
**Portland, Oregon 97224**

**Signature:**

**Signature:**

**Site inspection performed (yes/no)**

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## Aeration Trench Inspection Form

Groundwater Seeps Interim Remedial Measure
Former Koppers Facility Wauna, Oregon

| Date/Time | System Status (On/Off) | High Pressure Light (On/Off) | Low Pressure Light (On/Off) | PI-1 Pressure (psi) | PI-2 Pressure (psi) | T1 Temp. (° F) | Bleeder Valve Flow (scfm) | FI-1 System Flow (in. $H_20$) | FI-1 System Flow (cfm) | Run Time Meter ( hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| 6-13-2016 11:30 | On | Off | Off | 15.0 | 15.0 | 138 | na | Na | Na | 9015.6 |
| 16:30 | Off | Off | Off | Off | Off | Off | Na | na | na | 9015.6 |

| Chart Recorder Flow (cfm) | Change Circle Chart (Yes/No) | Sparge Zone 1 | | Sparge Zone 2 | | Sparge Zone 3 | | Sparge Zone 4 | | Sparge Zone 5 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | PI-Z1 Pressure (psi) | FI-Z1 Flow (cfm) | PI-Z2 Pressure (psi) | FI-Z2 Flow (cfm) | PI-Z3 Pressure (psi) | FI-Z3 Flow (cfm) | PI-Z4 Pressure (psi) | FI-Z4 Flow (cfm) | PI-Z5 Pressure (psi) | FI-Z5 Flow (cfm) |
| 4.54 | Yes | 7.25 | 1.7 | 6.75 | 1.7 | 12.5 | 1.7 | 14.75 | 0.60 | 5.25 | 1.7 |
| off | off | Off | Off | Off | Off | Off | Off | Off | Off | Off | off |

| Sparge Zone 6 | | Sparge Zone 7 | | Sparge Zone 8 | | Sparge Zone 9 | | Sparge Zone 10 | | Sparge Zone 11 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PI-Z6 Pressure (psi) | FI-Z6 Flow (cfm) | PI-Z7 Pressure (psi) | FI-Z7 Flow (cfm) | PI-Z8 Pressure (psi) | FI-Z8 Flow (cfm) | PI-Z9 Pressure (psi) | FI-Z9 Flow (cfm) | PI-Z10 Pressure (psi) | FI-Z10 Flow (cfm) | PI-Z11 Pressure (psi) | FI-Z11 Flow (cfm) |
| 14.75 | 1.1 | Off | off | Off | Off | Off | Off | Off | Off | Off | Off |
| Off | off | Off | Off | Off | Off | Off | Off | Off | Off | Off | Off |

| | ATT-07 | ATT-08 | ATT-09 |
|---|---|---|---|
| Well Depth (ft BTOC) | 15 | 14.5 | 13.5 |
| Water Level (ft BTOC) | 7.97 | 7.40 | 6.10 |
| Center of Water Column (ft BTOC) | 11.48 | 10.95 | 9.8 |

| | ATT-07 | ATT-08 | ATT-09 |
|---|---|---|---|
| pH | 6.84 | 6.92 | 6.93 |
| DO (mg/l) | 0.21 | 2.79 | 4.16 |
| Depth Measured (ft BTOC) | 11.48 | 10.95 | 9.8 |

**Name :**
**Jason Gardner Chief Environmental Technician**
**Amec Foster Wheeler**
**7376 SW Durham Road**
**Portland, Oregon 97224** **Signature:**

**Signature:**

**Site inspection performed (yes/no)**

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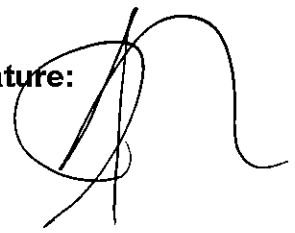
## Aeration Trench Inspection Form

Groundwater Seeps Interim Remedial Measure
Former Koppers Facility Wauna, Oregon

| Maintenance Issue | | | Maintenance Issue Resolution | | |
|---|---|---|---|---|---|
| **Name** | **Date/Time** | **Description** | **Name** | **Date/Time** | **Description** |
| Jason Gardner | 6/13/2016 | Checked for sheen at seeps along Columbia river where it had been noted. Water was low and seep was exposed. | Jason Gardner | 6/13/2016 | No sheen or odor was detected. |
| Jason Gardner | 6/13/2016 | System operation terminated to begin mna monitoring. | Jason Gardner | 6/13/2016 | All valves to sparge lines are closed and power to system is off at main disconnect. |
| Jason Gardner | 6/13/2016 | Inventory | Jason Gardner | 6/13/2016 | 1- Gast rotary lobe comp (old)<br>1- Zephyr compressor (current)<br>6gal- Bio disp.<br>2.5 gal- Glycolic acid<br>1- Shop vac<br>13- 5 gal buckets with lids<br>1- 55 gal steel drum empty<br>6qts-gear lube oil |
| Jason Gardner | 6/13/2016 | Ants | Jason Gardner | 6/13/2016 | Sprayed all access points with insect barrier. |
| Jason Gardner | 6/13/2016 | Cleaned up compound. | | | |

**Name :**
**Jason Gardner Chief Environmental Technician**
**Amec Foster Wheeler**
**7376 SW Durham Road**
**Portland, Oregon 97224** **Signature:**

**Signature:**



**Site inspection performed (yes/no)**

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**Photo 1:** 04/20/2016: One of two animal burrows identified during the Annual Cap Inspection

amec foster wheeler
7376 SW Durham Road
Portland, Oregon 97224

Project No.: 661M132360.2016.B
PROCESSED: MR
DATE May 2016
PAGE 1

Cap Repairs
Wauna Mill
Wauna, Oregon

PHOTOGRAPH LOG

**Photo 2:** 05/18/2016- Photo of filled animal burrow which was identified during the annual cap inspection.

**Photo 3:** 05/18/2016- Photo of filled animal burrow which was identified during the annual cap inspection

**April Water Level Monitoring Record**
Former Koppers Facility
Wauna, Oregon

Date: 4/7/16
Measured By: JV6 / WJM 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 | 1120 | 12.31 | 4.76 | 2.30 | 2.29 / 2.9 | All wells were opened & allowed to equilibrate for over an hour before DTW's were taken. |
| ATT-02 | 1123 | 15.21 | 7.38 | 4.25 | 4.39 / 5.11 | |
| ATT-03 | 1130 | 14.06 | 6.32 | 3.27 | 3.29 / 4.02 | |
| ATT-04 | 1136 | 12.73 | 5.38 | 2.72 | 2.74 / 3.42 | |
| ATT-05 | 1110 | 14.37 | 6.17 | 3.66 | 3.74 / 4.50 | |
| ATT-06 | 1025 | 14.11 | 6.01 | 3.38 | 3.42 / 4.15 | |
| ATT-10 | 1114 | 12.57 | 4.28 | 1.78 | 1.62 / 2.41 | |
| ATT-11 | 1147 | 13.88 | 6.60 | 3.88 | 4.51 / 5.25 | |
| ATT-12 | 1141 | 11.27 | 5.09 | 2.46 | 2.82 / 3.31 | |
| PMW-2 | 0840 | 11.62 | 2.59 | 0.14 | 0.02 / 0.43 | |
| PMW-5 | 0843 | 12.33 | 2.80 | 2.94 | 3.04 / 3.57 | |
| PMW-6 | 0857 | 9.28 | 0.32 | 0.37 | 0.22 / 0.85 | |
| PMWR-7 | 1138 | 11.82 | 5.17 | 2.72 | 2.77 / 3.41 | |
| PMW-13 | JV 1011 | 13.54 | JV 5.05 | 2.21 | 2.12 / 2.85 | ~~a black beetle, 15 cubes~~ JV couldn't find PMW-4 |
| SBW-1 | 1001 | 12.35 | 7.30 | 4.14 | 3.99 / 5.43 | |
| SBW-2 | 956 | 12.71 | 3.77 | 1.10 | 0.86 / 1.65 | |
| SBW-3 | 0814 | 10.06 | 6.09 | 4.46 | 4.31 / 5.47 | |
| SBW-4 | 0820 | 10.87 | 4.72 | 1.69 | 1.55 / 2.18 | |
| SBW-5 | 0945 | 10.06 | 4.30 | 3.62 | 3.20 / 4.68 | |
| SBW-6 | 0833 | 11.02 | 1.60 | 1.87 | 1.84 / 2.31 | |
| SBW-7 | 0910 | 10.51 | 4.88 | 4.36 | 4.40 / 5.31 | |
| SBW-8 | 0930 | 8.85 | 3.30 | 3.42 | 3.14 / 5.91 | |
| SBW-9 | 1005 | 12.85 | 7.97 | 4.77 | 4.55 / 6.29 | |
| SBW-10 | 1007 | 12.91 | 4.55 | 2.15 | 2.07 / 2.82 | |

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

ATT 9 - 4.73
ATT 8 - 6.06
ATT 7 - 6.64

## GROUNDWATER SAMPLING LOG
## Low Flow Sampling

### MONITORING WELL/PIEZOMETER NUMBER SBW-08

**Project Name:** Former Koppers Facility, Wauna, OR

**Date:** JC 4/7/16

**Project Number:** 661M132360.2016.B

**Weather Conditions:** clear

**Location:** Wauna, OR

**Sampler:** Jason Gardner

**Wind Speed/Direction:** East wind 0-2

### WELL INFORMATION

**Casing Diameter (in):** 2"

**Top of Casing Elevation (ft):**

**Initial Depth to Water (ft):** 3.30

**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 |
|---|---|---|---|---|---|---|---|---|
| ~~08:30~~ | 3.30 | 5.93 | 161 | 12.77 | -20.0 | 29.4 | 1.15 | some orange/oil cell |
| 08:35 | 3.38 | 5.38 | 146 | 12.89 | -74.9 | 12.6 | 0.62 | 1L |
| 08:40 | 3.38 | 5.41 | 143 | 12.84 | ~~-88.5~~ | 12.9 | 0.58 | 2L |
| 08:45 | 3.38 | 5.42 | 143 | 12.90 | -86.8 | 12.1 | 0.57 | 3L |
| 08:50 | 3.38 | 5.42 | 143 | 12.90 | -87.1 | 12.0 | 0.56 | 4L |
| | | | | | | | | |
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| | | | | | | | | |
| | | | | | | | | |

**Sample ID No.:** SBW-08-040716

**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:** 08:30

**Purge Completion Time:** 08:50

**Average Purge Rate (mL/min):** 124

**Analytical Lab:** ALS Kelso

**Sample Collection Time:** 0.8:50

**Purging Method:** peristaltic pump

**Sample Containers Used:** x40ml (HCl), x1L

**Chemical Analyses:** SVOCs, VOCs

**Other Field Observations:**

# GROUNDWATER SAMPLING LOG
## Low Flow Sampling

## MONITORING WELL/PIEZOMETER NUMBER SBW-07

**Project Name:** Former Koppers Facility, Wauna, OR

**Date:** 4/7/16

**Project Number:** 661M132360.2016.B

**Weather Conditions:** clear

**Location:** Wauna, OR

**Sampler:** JVG

**Wind Speed/Direction:** East wind 0-2

## WELL INFORMATION

**Casing Diameter (in):** 2"

**Top of Casing Elevation (ft):** —

**Initial Depth to Water (ft):** 4.88

**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 |
|---|---|---|---|---|---|---|---|---|
| 09:10 | 4.88 | 6.48 | .778 | 14.34 | -103.9 | 0.2 | 2.83 | Cell |
| 09:15 | 4.96 | 6.42 | .760 | 14.72 | -124.7 | 15.8 | 0.40 | 1L |
| 09:20 | 4.96 | 6.42 | .789 | 14.40 | -103.2 | 5.2 | 0.35 | 2L |
| 09:25 | 4.96 | 6.40 | .720 | 14.46 | -105.7 | 4.9 | 0.33 | 3L |
| 09:30 | 4.96 | 6.40 | .719 | 14.45 | -106.8 | 4.6 | 0.32 | 4L |
| | | | | | | | | |
| | | | | | | | | |
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| | | | | | | | | |
| | | | | | | | | |

**Sample ID No.:** SBW-07-040716

**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:** 09:10

**Purge Completion Time:** 0930

**Average Purge Rate (mL/min):** 124/M

**Analytical Lab:** ALS Kelso

**Sample Collection Time:** 09:30

**Purging Method:** peristaltic pump

**Sample Containers Used:** x40ml (HCl), x1L

**Chemical Analyses:** SVOCs, VOCs

**Other Field Observations:** Brown bio flocks in well

# GROUNDWATER SAMPLING LOG
## Low Flow Sampling

## MONITORING WELL/PIEZOMETER NUMBER SBW-05

**Project Name:** Former Koppers Facility, Wauna, OR

**Date:** 4/7/16

**Project Number:** 661M132360.2016.B

**Weather Conditions:** Clear

**Location:** Wauna, OR

**Sampler:** SVG/WJM

**Wind Speed/Direction:** East wind 0-2mph

## WELL INFORMATION

**Casing Diameter (in):** 2"

**Top of Casing Elevation (ft):**

**Initial Depth to Water (ft):** 4.30

**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 |
|---|---|---|---|---|---|---|---|---|
| 9:45 | 4.30 | 6.63 | 220 | 13.91 | +38.7 | 165 | 3.74 | cell |
| 9:50 | 4.34 | 6.40 | 239 | 12.77 | +33.0 | 15.9 | 1.53 | 1L |
| 9:55 | 4.35 | 6.44 | 302 | 12.82 | -6.0 | 3.2 | 1.11 | 2L |
| 10:00 | 4.35 | 6.45 | 305 | 12.78 | -8.6 | 3.6 | 1.11 | 3L |
| 10:05 | 4.35 | 6.45 | 307 | 12.82 | -8.5 | 3.5 | 1.09 | 4L |
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**Sample ID No.:** SBW-05-040716

**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:** 9:45

**Purge Completion Time:** 10:05

**Average Purge Rate (mL/min):** .2 L/M

**Analytical Lab:** ALS Kelso

**Sample Collection Time:** 10:45

**Purging Method:** peristaltic pump

**Sample Containers Used:** x40ml (HCl), x1L

**Chemical Analyses:** SVOCs, VOCs

**Other Field Observations:** Orange bio floc in well

## GROUNDWATER SAMPLING LOG
## Low Flow Sampling

### MONITORING WELL/PIEZOMETER NUMBER ATT-06

**Project Name:** Former Koppers Facility, Wauna, OR

**Date:** 4/7/16

**Project Number:** 661M132360.2016.B

**Weather Conditions:** clear ~ 80

**Location:** Wauna, OR

**Sampler:** SVG/ WJM

**Wind Speed/Direction:** East wind 0-3

### WELL INFORMATION

**Casing Diameter (in):** 2"

**Top of Casing Elevation (ft):**

**Initial Depth to Water (ft):** 6.01

**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 |
|---|---|---|---|---|---|---|---|---|
| 10:25 | 6.01 | 6.79 | 130 | 14.38 | -59.8 | 9.7 | 0.79 | cell |
| 10:30 | 6.07 | 6.38 | 174 | 14.02 | -50.9 | 2.3 | 0.11 | 1L |
| 10:35 | 6.07 | 6.35 | 174 | 14.14 | -49.6 | 1.9 | 0.10 | 2L |
| 10:40 | 6.07 | 6.34 | 174 | 14.13 | -49.0 | 1.7 | 0.10 | 3L |
| 10:45 | 6.07 | 6.34 | 174 | 14.15 | -48.5 | 1.7 | 0.10 | 4L |
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**Sample ID No.:** ATT-06- 040716 DUP- 040716

**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:** 10:25

**Purge Completion Time:** 10:45

**Average Purge Rate (mL/min):** .2 L/m

**Analytical Lab:** ALS Kelso

**Sample Collection Time:** 10:45

**Purging Method:** peristaltic pump

**Sample Containers Used:** x40ml (HCl), x1L

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

**Other Field Observations:** DUP was collected @ this well

# GROUNDWATER SAMPLING LOG
## Low Flow Sampling

## MONITORING WELL/PIEZOMETER NUMBER ATT-05

**Project Name:** Former Koppers Facility, Wauna, OR

**Date:** 4/7/16

**Project Number:** 661M132360.2016.B

**Weather Conditions:** clear

**Location:** Wauna, OR

**Sampler:** JVG/WJM

**Wind Speed/Direction:** West wind 0-1

## WELL INFORMATION

**Casing Diameter (in):** 2"

**Top of Casing Elevation (ft):** —

**Initial Depth to Water (ft):** 6.17

**Wellhead Condition:** Good

**Groundwater Elevation (ft):** I

**Depth of Well Casing (ft):**

**Actual Purge Volume (gallons):** 5L

## PURGING MEASUREMENTS

| Time | Water Level (ft btoc) | pH (std. units) | SC (ms/cm) | Temp. (°C) | ORP (mv) | Turbidity (NTU) | DO (mg/L) | Notes |
|---|---|---|---|---|---|---|---|---|
| 11:10 | 6.17 | 6.43 | 213 | 15.03 | 2.01 | 4.6 | -1.3 | cell |
| 11:15 | 6.29 | 6.34 | 208 | 13.53 | 0.360 | 1.0 | -34.1 | 1L |
| 11:20 | 6.29 | 6.35 | 206 | 13.65 | 0.142 | 0.8 | -52.9 | 2L |
| 11:25 | 6.30 | 6.36 | 204 | 13.70 | 0.05 | 0.8 | -61.6 | 3L |
| 11:30 | 6.29 | 6.38 | 204 | 13.72 | 0.05 | 0.8 | -62.7 | 4L |
| 11:35 | 6.29 | 6.38 | 204 | 13.73 | 0.04 | 0.8 | -62.9 | 5L |
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**Sample ID No.:** ATT-05-040716

**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:** 11:10

**Purge Completion Time:** 11:35

**Average Purge Rate (mL/min):** .2 L/m

**Analytical Lab:** ALS Kelso

**Sample Collection Time:** 11:35

**Purging Method:** peristaltic pump

**Sample Containers Used:** x40ml (HCl), x1L

**Chemical Analyses:** SVOCs, VOCs

**Other Field Observations:** Strong phenol odor in purge water

## GROUNDWATER SAMPLING LOG
## Low Flow Sampling

### MONITORING WELL/PIEZOMETER NUMBER ATT-10

**Project Name:** Former Koppers Facility, Wauna, OR

**Date:** 4/7/16

**Project Number:** 661M132360.2016.B

**Weather Conditions:** clear ~60

**Location:** Wauna, OR

**Sampler:** JVG/WJM

**Wind Speed/Direction:** West wind 0-1

### WELL INFORMATION

**Casing Diameter (in):** 2"

**Groundwater Elevation (ft):** —

**Top of Casing Elevation (ft):**

**Depth of Well Casing (ft):** —

**Initial Depth to Water (ft):** 4.28

**Actual Purge Volume (gallons):** 4L

**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 |
|---|---|---|---|---|---|---|---|---|
| 11:50 | 4.28 | 6.64 | 95 | 13.90 | -13.2 | 860.3 | 2.73 | Cer |
| 11:55 | 4.37 | 6.42 | 104 | 14.01 | -25.2 | 3.6 | 0.04 | 1L |
| 12:00 | 4.37 | 6.28 | 130 | 13.80 | -33.7 | 2.0 | 0.05 | 2L |
| 12:05 | 4.37 | 6.25 | 133 | 13.86 | -33.7 | 2.3 | 0.05 | 3L |
| 12:10 | 4.37 | 6.25 | 132 | 13.77 | -33.6 | 2.3 | 0.05 | 4L |
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**Sample ID No.:** ATT-10- 040716

**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:** 11:50

**Sample Collection Time:** 12:10

**Purge Completion Time:** 12:10

**Purging Method:** peristaltic pump

**Average Purge Rate (mL/min):** ~200

**Sample Containers Used:** x40ml (HCl), x1L

**Analytical Lab:** ALS Kelso

**Chemical Analyses:** SVOCs, VOCs

**Other Field Observations:** whitish bio floc in purge water

# GROUNDWATER SAMPLING LOG
## Low Flow Sampling

## MONITORING WELL/PIEZOMETER NUMBER ATT-01

**Project Name:** Former Koppers Facility, Wauna, OR

**Date:** 4/7/16

**Project Number:** 661M132360.2016.B

**Weather Conditions:** Clear ~80's F

**Location:** Wauna, OR

**Sampler:** JVG / WJM

**Wind Speed/Direction:** west wind ~ 0-1

## WELL INFORMATION

**Casing Diameter (in):** 2"

**Top of Casing Elevation (ft):** —

**Initial Depth to Water (ft):** 4.76

**Wellhead Condition:** Good

**Groundwater Elevation (ft):** —

**Depth of Well Casing (ft):** —

**Actual Purge Volume (gallons):** 5L

## PURGING MEASUREMENTS

| Time | Water Level (ft btoc) | pH (std. units) | SC (ms/cm) | Temp. (°C) | ORP (mv) | Turbidity (NTU) | DO (mg/L) | Notes |
|---|---|---|---|---|---|---|---|---|
| 12:30 | 4.76 | 6.38 | 252 | 18.53 | -24.1 | 30.1 | 3.06 | cell |
| 12:35 | 4.89 | 6.39 | 2666 | 14.79 | -73.2 | 19.3 | 0.20 | 1L |
| 12:40 | 4.89 | 6.39 | 2667 | 14.23 | -77.6 | 3.8 | 0.60 | 2L |
| 12:45 | 4.89 | 6.39 | 2668 | 14.32 | -78.4 | 1.1 | 0.54 | 3L |
| 12:50 | 4.89 | 6.39 | 2667 | 14.21 | -78.8 | 0.8 | 0.35 | 4L |
| 12:55 | 4.89 | 6.39 | 2668 | 14.20 | -79.0 | 0.7 | 0.37 | 5L |
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**Sample ID No.:** ATT-01- 040716

**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:** 12:30

**Purge Completion Time:** 12:55

**Average Purge Rate (mL/min):** 204

**Analytical Lab:** ALS Kelso

**Sample Collection Time:** 12:55

**Purging Method:** peristaltic pump

**Sample Containers Used:** x40ml (HCl), x1L

**Chemical Analyses:** SVOCs, VOCs

**Other Field Observations:**

# GROUNDWATER SAMPLING LOG
## Low Flow Sampling

## MONITORING WELL/PIEZOMETER NUMBER ATT-02

**Project Name:** Former Koppers Facility, Wauna, OR

**Date:** 4/7/16

**Project Number:** 661M132360.2016.B

**Weather Conditions:** clear ~80°F

**Location:** Wauna, OR

**Sampler:** JVG / WJM

**Wind Speed/Direction:** west wind 0-1

## WELL INFORMATION

**Casing Diameter (in):** 2"

**Top of Casing Elevation (ft):** —

**Initial Depth to Water (ft):** 7.38

**Wellhead Condition:** Good

**Groundwater Elevation (ft):** —

**Depth of Well Casing (ft):** —

**Actual Purge Volume (gallons):** 5L

## PURGING MEASUREMENTS

| Time | Water Level (ft btoc) | pH (std. units) | SC (ms/cm) | Temp. (°C) | ORP (mv) | Turbidity (NTU) | DO (mg/L) | Notes |
|---|---|---|---|---|---|---|---|---|
| 13:10 | 7.38 | 6.68 | 177 | 14.11 | -86.9 | 144. | 3.28 | ceil |
| 13:15 | 7.46 | 6.47 | 182 | 13.90 | -110.8 | 29.7 | 0.22 | 1L |
| 13:20 | 7.46 | 6.50 | 181 | 14.26 | -114.9 | 10.5 | 0.22 | 2L |
| 13:25 | 7.47 | 6.53 | 175 | 13.91 | -116.6 | 3.8 | 0.22 | 3L |
| 13:30 | 7.47 | 6.53 | 173 | 13.89 | -116.9 | 3.6 | 0.22 | 4L |
| 13:35 | 7.47 | 6.53 | 172 | 13.89 | -117.0 | 3.5 | 0.22 | 5L |
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**Sample ID No.:** ATT-02- 040716

**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:** 13:10

**Purge Completion Time:** 13:35

**Average Purge Rate (mL/min):** .2 L/M

**Analytical Lab:** ALS Kelso

**Sample Collection Time:** 13:35

**Purging Method:** peristaltic pump

**Sample Containers Used:** x40ml (HCl), x1L

**Chemical Analyses:** SVOCs, VOCs

**Other Field Observations:**

## GROUNDWATER SAMPLING LOG
## Low Flow Sampling

### MONITORING WELL/PIEZOMETER NUMBER ATT-03

**Project Name:** Former Koppers Facility, Wauna, OR

**Date:** 4/7/16

**Project Number:** 661M132360.2016.B

**Weather Conditions:** clear 80°F

**Location:** Wauna, OR

**Sampler:** AWG/WSM

**Wind Speed/Direction:** west wind 0-1

### WELL INFORMATION

**Casing Diameter (in):** 2"

**Top of Casing Elevation (ft):** —

**Initial Depth to Water (ft):** 6.32

**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 |
|---|---|---|---|---|---|---|---|---|
| 13:55 | 6.32 | 6.75 | 83 | 17.38 | -30.9 | 263 | 4.37 | cell |
| 14:00 | 6.39 | 6.53 | 79 | 15.18 | -5.4 | 14.5 | 2.00 | 1L |
| 14:05 | 6.39 | 6.43 | 78 | 15.34 | +14.9 | 0.8 | 1.34 | 2L |
| 14:10 | 6.39 | 6.43 | 78 | 15.36 | +15.0 | 0.8 | 1.32 | 3L |
| 14:15 | 6.39 | 6.43 | 77 | 15.40 | +15.2 | 0.9 | 1.29 | 4L |
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**Sample ID No.:** ATT-03-040716

**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:** 13:55

**Purge Completion Time:** 14:15

**Average Purge Rate (mL/min):** .2 L/M

**Analytical Lab:** ALS Kelso

**Sample Collection Time:** 14:15

**Purging Method:** peristaltic pump

**Sample Containers Used:** x40ml (HCl), x1L

**Chemical Analyses:** SVOCs, VOCs

**Other Field Observations:**

# GROUNDWATER SAMPLING LOG
## Low Flow Sampling

## MONITORING WELL/PIEZOMETER NUMBER ATT-04

**Project Name:** Former Koppers Facility, Wauna, OR

**Date:** 4/7/16

**Project Number:** 661M132360.2016.B

**Weather Conditions:** clear ~80

**Location:** Wauna, OR

**Sampler:** JVG/WJM

**Wind Speed/Direction:** westwind 0-2

## WELL INFORMATION

**Casing Diameter (in):** 2"

**Top of Casing Elevation (ft):** —

**Initial Depth to Water (ft):** 5.38

**Wellhead Condition:** Good

**Groundwater Elevation (ft):** —

**Depth of Well Casing (ft):** —

**Actual Purge Volume (gallons):** 5L

## PURGING MEASUREMENTS

| Time | Water Level (ft btoc) | pH (std. units) | SC (ms/cm) | Temp. (°C) | ORP (mv) | Turbidity (NTU) | DO (mg/L) | Notes |
|---|---|---|---|---|---|---|---|---|
| 14:40 | 5.38 | 6.60 | 167 | 14.88 | +30.4 | 107 | 0.33 | cell |
| 14:45 | 5.44 | 6.63 | 163 | 13.98 | +8.5 | 36.5 | 0.44 | 1L |
| 14:50 | 5.44 | 6.62 | 157 | 13.58 | -2.6 | 9.4 | 0.17 | 2L |
| 14:55 | 5.44 | 6.63 | 161 | 13.98 | -4.1 | 2.1 | 0.20 | 3L |
| 15:00 | 5.44 | 6.63 | 161 | 14.01 | -5.0 | 1.8 | 0.21 | 4L |
| 15:05 | 5.44 | 6.65 | 161 | 14.01 | -5.3 | 1.7 | 0.23 | 5L |
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**Sample ID No.:** ATT-04-040716

**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:** 14:40

**Purge Completion Time:** 15:05

**Average Purge Rate (mL/min):** 124

**Analytical Lab:** ALS Kelso

**Sample Collection Time:** 15:05

**Purging Method:** peristaltic pump

**Sample Containers Used:** x40ml (HCl), x1L

**Chemical Analyses:** SVOCs, VOCs

**Other Field Observations:** Orange bio in well

# GROUNDWATER SAMPLING LOG
## Low Flow Sampling

## MONITORING WELL/PIEZOMETER NUMBER PMW-07R

**Project Name:** Former Koppers Facility, Wauna, OR

**Date:** 4/7/16

**Project Number:** 661M132360.2016.B

**Weather Conditions:** clear ~80

**Location:** Wauna, OR

**Sampler:** JVB/WJM

**Wind Speed/Direction:** west wind 0-1

## WELL INFORMATION

**Casing Diameter (in):** 2"

**Top of Casing Elevation (ft):** –

**Initial Depth to Water (ft):** 5.17

**Wellhead Condition:** Good

**Groundwater Elevation (ft):** –

**Depth of Well Casing (ft):** –

**Actual Purge Volume (gallons):** 5L

## PURGING MEASUREMENTS

| Time | Water Level (ft btoc) | pH (std. units) | SC (ms/cm) | Temp. (°C) | ORP (mv) | Turbidity (NTU) | DO (mg/L) | Notes |
|---|---|---|---|---|---|---|---|---|
| 15:25 | 5.17 | 6.95 | .126 | 12.74 | +13.3 | 183 | 0.73 | cell |
| 15:30 | 5.26 | 6.54 | 123 | 12.72 | -12.7 | 1 | 0.31 | 1L |
| 15:35 | 5.26 | 6.44 | 123 | 12.79 | -18.6 | | 0.28 | 2L |
| 15:40 | 5.26 | 6.36 | 122 | 12.52 | -16.2 | | 0.15 | 3L |
| 15:45 | 5.26 | 6.34 | 122 | 12.49 | -16.9 | | 0.14 | 4L |
| 15:50 | 5.26 | 6.33 | 122 | 12.48 | -17.0 | | 0.14 | 5L |
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**Sample ID No.:** PMW-07- 040716

**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:** 15:25

**Purge Completion Time:** 15:50

**Average Purge Rate (mL/min):** ~200 mL/min

**Analytical Lab:** ALS Kelso

**Sample Collection Time:** 15:50

**Purging Method:** peristaltic pump

**Sample Containers Used:** x40ml (HCl), x1L

**Chemical Analyses:** SVOCs, VOCs, MNA

**Other Field Observations:** Orange bioFlock in purgewater

## GROUNDWATER SAMPLING LOG
## Low Flow Sampling

### MONITORING WELL/PIEZOMETER NUMBER ATT-12

**Project Name:** Former Koppers Facility, Wauna, OR

**Date:** 4/7/16

**Project Number:** 661M132360.2016.B

**Weather Conditions:** clear ~80F

**Location:** Wauna, OR

**Sampler:** JW6 / WJM

**Wind Speed/Direction:** west wind 0-2

### WELL INFORMATION

**Casing Diameter (in):** 2"

**Top of Casing Elevation (ft):**

**Initial Depth to Water (ft):** 5.09

**Wellhead Condition:** Good

**Groundwater Elevation (ft):**

**Depth of Well Casing (ft):**

**Actual Purge Volume (gallons):** 6L

### PURGING MEASUREMENTS

| Time | Water Level (ft btoc) | pH (std. units) | SC (ms/cm) | Temp. (°C) | ORP (mv) | Turbidity (NTU) | DO (mg/L) | Notes |
|---|---|---|---|---|---|---|---|---|
| 16:10 | 5.09 | 6.20 | 392 | 15.29 | *11.1 | 7.2 | 3.19 | cell |
| 16:15 | 5.14 | 6.16 | 396 | 13.93 | -7.9 | 2.0 | 0.45 | 1L |
| 16:20 | 5.14 | 6.12 | 395 | 13.87 | -15.1 | 2.9 | 0.38 | 2L |
| 16:25 | 5.14 | 6.10 | 393 | 13.86 | -21.5 | 3.7 | 0.30 | 3L |
| 16:30 | 5.14 | 6.09 | 391 | 13.94 | -27.6 | 1.6 | 0.18 | 4L |
| 16:35 | 5.14 | 6.09 | 391 | 13.92 | -28.1 | 1.2 | 0.15 | 5L |
| 16:40 | 5.14 | 6.09 | 391 | 13.92 | -28.3 | 1.5 | 0.14 | 6L |
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**Sample ID No.:** ATT-12-040716

**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:** 16:10

**Purge Completion Time:** 16:40

**Average Purge Rate (mL/min):** 124

**Analytical Lab:** ALS Kelso

**Sample Collection Time:** 16:40

**Purging Method:** peristaltic pump

**Sample Containers Used:** x40ml (HCl), x1L

**Chemical Analyses:** SVOCs, VOCs

**Other Field Observations:**

## GROUNDWATER SAMPLING LOG
## Low Flow Sampling

### MONITORING WELL/PIEZOMETER NUMBER ATT-11

**Project Name:** Former Koppers Facility, Wauna, OR

**Date:** 4/7/16

**Project Number:** 661M132360.2016.B

**Weather Conditions:** clear ~60F

**Location:** Wauna, OR

**Sampler:** JV6/WJM

**Wind Speed/Direction:** West wind 0-2

### WELL INFORMATION

**Casing Diameter (in):** 2"

**Top of Casing Elevation (ft):** —

**Initial Depth to Water (ft):** 6.60

**Wellhead Condition:** Good

**Groundwater Elevation (ft):** —

**Depth of Well Casing (ft):** —

**Actual Purge Volume (gallons):** 5L

### PURGING MEASUREMENTS

| Time | Water Level (ft btoc) | pH (std. units) | SC (ms/cm) | Temp. (°C) | ORP (mv) | Turbidity (NTU) | DO (mg/L) | Notes |
|---|---|---|---|---|---|---|---|---|
| 17:05 | 6.66 | 6.36 | 4066 | 15.12 | -5.5 | OR | 2.56 | cell |
| 17:10 | 6.72 | 6.29 | 401 | 13.85 | -32.8 | 16.7 | 0.33 | 1L |
| 17:15 | 6.72 | 6.31 | 376 | 13.34 | -39.3 | 1.6 | 0.14 | 2L |
| 17:20 | 6.72 | 6.31 | 315 | 13.33 | -39.2 | 0.7 | 0.14 | 3L |
| 17:25 | 6.72 | 6.31 | 315 | 13.32 | -40.1 | 0.7 | 0.12 | 4L |
| 17:30 | 6.72 | 6.31 | 314 | 13.30 | -42.3 | 0.7 | 0.12 | 5L |
| | | | | | | | | |
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**Sample ID No.:** ATT-11- 040716

**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:** 17:05

**Purge Completion Time:** 17:30

**Average Purge Rate (mL/min):** .24M

**Analytical Lab:** ALS Kelso

**Sample Collection Time:** 17:30

**Purging Method:** peristaltic pump

**Sample Containers Used:** x40ml (HCl), x1L

**Chemical Analyses:** SVOCs, VOCs

**Other Field Observations:** Bio Flock in well. Rust to tope in color.

ALS Environmental

# CHAIN OF CUSTODY
# 68791

002

SR#_____

COC Set 1 of 2

COC#_____

1317 South 13th Ave, Kelso, WA 98626 Phone (360) 577-7222 / 800-695-7222 / FAX (360) 636-1068
www.alsglobal.com



| | |
|---|---|
| Project Name: Wauna | Project Number: 661M132360.2016.B |
| Project Manager: Steve Barnett | |
| Company: AMEC FW | |
| Address: 7376 SW Durham rd Portland, Ore | |
| Phone #: 503 639 3400 | email: steve.barnett@amec.com |
| Sampler Signature: | Sampler Printed Name: Jason Gardner |

| CLIENT SAMPLE ID | LABID | SAMPLING Date | SAMPLING Time | Matrix | NUMBER OF CONTAINERS | 7D 8270D / SVO LL | 14D 8260C / VOC FP | 1 | 2 | 3 | 4 | 5 | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. SBW-Φ8-040716 | | 4/7/16 | 8:50 | W | 5 | X | X | | | | | | |
| 2. SBW-Φ7-040716 | | | 09:30 | | | X | X | | | | | | |
| 3. SBW-Φ5-040716 | | | 10:05 | | | X | X | | | | | | |
| 4. ATT-Φ6-040716 | | | 10:45 | | | X | X | | | | | | |
| 5. ATT-Φ5-040716 | | | 11:35 | | | X | X | | | | | | |
| 6. ATT-1Φ-040716 | | | 12:10 | | | X | X | | | | | | |
| 7. ATT-Φ1-040716 | | | 12:55 | | | X | X | | | | | | |
| 8. ATT-Φ2-040716 | | | 13:35 | | | X | X | | | | | | |
| 9. ATT-Φ3-040716 | | | 14:15 | | | X | X | | | | | | |
| 10. ATT-Φ4-040716 | | | 15:05 | | | X | X | | | | | | |

## Report Requirements

___ I. Routine Report: Method Blank, Surrogate, as required

___ II. Report Dup., MS, MSD as required

___ III. CLP Like Summary (no raw data)

___ IV. Data Validation Report

___ V. EDD

## Invoice Information

P.O.#_____

Bill To:_____

## Turnaround Requirements

___ 24 hr. ___ 48 hr.

___ 5 Day

_X_ Standard

Requested Report Date

Circle which metals are to be analyzed

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Special Instructions/Comments:

*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other_____(Circle One)

| Relinquished By: | Received By: | Relinquished By: | Received By: | Relinquished By: | Received By: |
|---|---|---|---|---|---|
| Signature | Signature | Signature | Signature | Signature | Signature |
| Printed Name: Jason Gardner | Printed Name | Printed Name | Printed Name | Printed Name | Printed Name |
| Firm: AMECFW 4/7/16 20:00 | Firm | Firm | Firm | Firm | Firm |
| Date/Time | Date/Time | Date/Time | Date/Time | Date/Time | Date/Time |

ALS Environmental

# CHAIN OF CUSTODY
# 68791

002

SR#_____

COC Set 1 of 2

COC#_____

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| | |
|---|---|
| Project Name: Wauna | Project Number: 666174132360.2016.B |
| Project Manager: Steve Barnett | |
| Company: AMEC FW | |
| Address: 7376 SW Durham rd, Portland, Ore | |
| Phone #: 503 639 3400 | email: steve.barnett@amec.com |
| Sampler Signature: | Sampler Printed Name: Jason Gardner |

| CLIENT SAMPLE ID | LABID | SAMPLING Date | SAMPLING Time | Matrix | NUMBER OF CONTAINERS | 7D 8270D / SVOLL | 14D 8260C / VOC FP | 1 | 2 | 3 | 4 | 5 | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. PMW-07R-040716 | | 4/7/16 | 15:50 | W | 5 | X | X | | | | | | |
| 2. ATT-12-040716 | | | 16:40 | | | X | X | | | | | | |
| 3. ATT-11-040716 | | | 17:30 | | | X | X | | | | | | |
| 4. Dup-040716 | | | NA | | | X | X | | | | | | |
| 5. TB | | NA | NA | | 3 | | X | | | | | | |
| 6. | | | | | | | | | | | | | |
| 7. | | | | | | | | | | | | | |
| 8. | | | | | | | | | | | | | |
| 9. | | | | | | | | | | | | | |
| 10. | | | | | | | | | | | | | |

## Report Requirements

- ___ I. Routine Report: Method Blank, Surrogate, as required
- ___ II. Report Dup., MS, MSD as required
- ___ III. CLP Like Summary (no raw data)
- ___ IV. Data Validation Report
- ___ V. EDD

## Invoice Information

P.O.#_____

Bill To:_____

## Turnaround Requirements

___ 24 hr. ___ 48 hr.
___ 5 Day
✓ Standard

Requested Report Date

Circle which metals are to be analyzed

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Special Instructions/Comments:

*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other_____(Circle One)

| Relinquished By: | Received By: | Relinquished By: | Received By: | Relinquished By: | Received By: |
|---|---|---|---|---|---|
| Signature | Signature | Signature | Signature | Signature | Signature |
| Printed Name: Jason Gardner | Printed Name | Printed Name | Printed Name | Printed Name | Printed Name |
| Firm: AMEC FW | Firm | Firm | Firm | Firm | Firm |
| Date/Time: 4/7/16 20:10 | Date/Time | Date/Time | Date/Time | Date/Time | Date/Time |