



720 Olive Way Suite 1900
Seattle, Washington 98101
Phone 206.287.9130
Fax 206.287.9131
www.anchorqea.com

MEMORANDUM

To: Barry Rogowski, Adam Harris, Pete Adolphson, and Kevin MacLachlan, Washington State Department of Ecology
Date: April 8, 2013

From: Clay Patmont and Nathan Soccorsy, Anchor QEA, LLC
Project: 120909-01.01

cc: Dwayne Arino and Diane Keith, Jeld-Wen
Scott Miller, SLR International

Re: Jeld-Wen Former Nord Door Site Sediment Quality Assurance Project Plan Addendum

This addendum to the *Quality Assurance Project Plan Marine and Maulsby Marsh Sediments Characterization* (QAPP; Anchor QEA 2012) describes the procedures that will be used to complete the characterization of the sediments adjacent to the Jeld-Wen Former Nord Door Facility (Site) located in Everett, Washington. This QAPP addendum describes additional surface and subsurface sampling and analysis to complete a Remedial Investigation and Feasibility Study (RI/FS) for the Site.

Marine surface sediments were collected in 2012 and analyzed in accordance with the approved QAPP (Anchor QEA 2012). As determined in consultation with the Washington State Department of Ecology (Ecology) the following additional surface sediment collection and analysis will be:

- Collection and analysis of 10 discrete surficial sediment (0 to 10 centimeters [cm]) locations
- Submittal of three archived discrete marine surface sediment (JW-EA02-SS07, JW-EA03-SS11 and JW-EA03-SS12) locations for dioxin/furan (D/F) analysis
- Additional surficial sediments will be collected and archived for analysis if necessary

As specified in Section 2.1 of the Sampling and Analysis Plan (Attachment 1 of the approved QAPP), sediment coring sample locations have been determined based on the marine surface sediment results. In accordance with the QAPP, the following cores will be advanced at locations:

- JW-EA02-SS05 for vertical D/F characterization
- JW-EA04-SS13 for vertical D/F characterization
- JW-EA06-SS23 for vertical D/F characterization
- JW-EA07-SS27 for vertical D/F characterization
- JW-EA10-SS42 for vertical D/F and polychlorinated biphenyl (PCB) characterization
- JW-EA09-SS38 for vertical D/F and PCB characterization
- Additional cores will be collected and archived for analysis if necessary

SURFACE SEDIMENT CHARACTERIZATION

In accordance with the approved QAPP (Anchor QEA 2012), D/F congener analysis was conducted in 2012 on the marine surface sediment collected adjacent to the Site. There are no promulgated Sediment Management Standards (SMS) criteria for D/F. Ecology used a preliminary screening level (PSL) for D/F of 5 nanograms per kilogram (ng/kg) dry weight (dw) toxicity equivalency factor (TEQ) based on the practical quantitation limit for the D/F analytical method. The D/F TEQ results were loaded into ArcGIS and inverse distance weighted (IDW) interpolation was performed to interpolate surface sediment D/F TEQ concentrations, as shown in Figure 1.

PCB congener analysis was also performed on marine surface samples collected adjacent to the Site. None of the total PCB congener results exceeded the promulgated SMS sediment quality standard chemical criterion of 12 milligrams per kilogram (mg/kg) organic carbon normalized (OCN). Ecology calculated a PSL for PCBs of 0.561 mg/kg OCN based on a preliminary site-specific biota sediment accumulation factor (BSAF). The total PCB congener results entered into ArcGIS and IDW interpolation was performed to interpolate surface sediment PCB concentrations, as shown in Figure 2.

Practical quantitation limits for D/F and PCB congeners are presented in Table 2 of the approved QAPP (Anchor QEA 2012).

PROPOSED SURFACE SEDIMENT SAMPLING PLAN

As shown in Figures 1 and 2, interpolated D/F TEQs and total PCB congener concentrations were greater than the PSLs and may exceed the regional background cleanup criteria in preparation by Ecology. Additional sampling has been proposed based on the interpolated

PSL IDW contours. Previously collected archived discrete marine surface sediment locations, JW-EA02-07, JW-EA03-SS11 and JW-EA03-SS12, will be submitted for D/F analysis. New marine surface sediment samples will be collected as follows:

- JW-SS101 and JW-SS102 will be collected and analyzed to bound D/F concentrations to the west of Site Exposure Area (EA) 06.
- JW-103 through JW-105 will be collected and analyzed to bound D/F concentrations to the south of EA07 and EA08.
- JW-SS106 and JW-SS107 will be collected and analyzed to bound total PCB congener concentrations at JW-EA09-SS35 and JW-EA09-SS37.
- JW-108 through JW-110 will be collected and analyzed for D/F and PCB congeners to bound location JW-EA09-SS38.
- JW-201 through JW-219 will be collected and archived for analysis pending the review of results of samples JW-101 through JW-110. If the marine surface sediment results at the adjacent locations are below the respective PSLs, no archived surface sample volumes will be analyzed.

All QAPP addendum surface sediment sampling locations are presented in Table 1 and Figure 3.

VERTICAL SEDIMENT CHARACTERIZATION

Based on a review of the marine surface sediment sampling results and in consultation with Ecology, six primary core locations are proposed to characterize the vertical extent of elevated sediment concentrations of D/F TEQ and PCBs for the purposes of the RI/FS. Cores will be advanced at locations JW-EA02-SS05, JW-EA04-SS13, JW-EA06-SS23, and JW-EA07-SS27 to characterize D/F TEQ levels. Locations JW-EA09-SS38 and JW-EA10-SS42 will be advanced to characterize D/F TEQ and total PCBs. Archive cores will be collected at locations JW-EA06-SS27, JW-EA09-SS36 and JW-212 for analysis pending the results of the primary core locations. Analysis of the archived core interval(s) will only be initiated if the subsurface interval(s) results in the primary cores are above the respective PSLs (i.e. archive interval[s] will be submitted for analysis only as necessary).

The sample location nomenclature will be identified with an SC (sediment core) designation (e.g., JW-EA09-SC42). Practical quantitation limits for D/F and PCB congeners are

presented in Table 2 of the approved QAPP (Anchor QEA 2012). All QAPP addendum sediment core sampling locations are presented in Table 1 and Figure 3.

REPORTING AND PATH FORWARD

Once chemical testing is completed and the chemical test results are validated, Anchor QEA will upload the data to Ecology's Electronic Information Management (EIM) system. Upon Ecology's review of the results, the RI/FS Report will be prepared and subsequently submitted to Ecology.

TABLE

Table 1
Jeld-Wen Former Nord Door Site - Quality Assurance Project Plan Addendum Sampling Locations

Station ID	Northing	Easting	Description
JW-101	373756.5669	1302147.179	Surface Grab - D/F Congener Analysis
JW-102	373626.4412	1302133.377	Surface Grab - D/F Congener Analysis
JW-103	373185.3443	1302317.722	Surface Grab - D/F Congener Analysis
JW-104	373080.1306	1302380.622	Surface Grab - D/F Congener Analysis
JW-105	372981.7788	1302448.096	Surface Grab - D/F Congener Analysis
JW-106	372593.8304	1302354.674	Surface Grab - PCB Congener Analysis
JW-107	372314.1403	1302375.049	Surface Grab - PCB Congener Analysis
JW-108	372136.2221	1302607.962	Surface Grab - D/F and PCB Congener Analysis
JW-109	372034.8555	1302787.753	Surface Grab - D/F and PCB Congener Analysis
JW-110	371903.3383	1302727.141	Surface Grab - D/F and PCB Congener Analysis
JW-EA02-SS05	373760.881	1303195.087	Surface Grab - D/F Congener Analysis ¹
JW-EA03-SS11	374137.726	1302840.232	Surface Grab - D/F Congener Analysis ¹
JW-EA03-SS12	374201.549	1302912.309	Surface Grab - D/F Congener Analysis ¹
JW-201	373901.0624	1302021.121	Archive Surface Grab
JW-202	373774.6292	1302009.36	Archive Surface Grab
JW-203	373593.31	1302054.445	Archive Surface Grab
JW-204	373469.8172	1301990.738	Archive Surface Grab
JW-205	373211.6477	1302180.487	Archive Surface Grab
JW-206	373086.9925	1302251.392	Archive Surface Grab
JW-207	372986.3532	1302337.164	Archive Surface Grab
JW-208	372599.3192	1302131.303	Archive Surface Grab
JW-209	372279.3458	1302183.819	Archive Surface Grab
JW-210	372094.3619	1302419.96	Archive Surface Grab
JW-211	371905.3436	1302289.984	Archive Surface Grab
JW-212	371830.0449	1302498.207	Archive Surface Grab
JW-213	371623.1496	1302416.074	Archive Surface Grab
JW-214	371783.2575	1302723.71	Archive Surface Grab
JW-215	371628.8678	1302604.773	Archive Surface Grab
JW-216	371644.3599	1302181.5	Archive Surface Grab
JW-217	372797.9701	1302194.62	Archive Surface Grab
JW-218	373016.26	1302153.55	Archive Surface Grab
JW-219	373330.1901	1301857.3	Archive Surface Grab
JW-EA02-SC05	373760.881	1303195.087	Subsurface Core - D/F Congener Analysis
JW-EA04-SC13	374233.712	1302747.917	Subsurface Core - D/F Congener Analysis
JW-EA06-SC23	373522.9765	1302395.4	Subsurface Core - D/F Congener Analysis
JW-EA07-SC27	373317.7446	1302622.479	Subsurface Core - D/F Congener Analysis
JW-EA09-SC38	372184.2357	1302788.425	Subsurface Core - D/F and PCB Congener Analysis
JW-EA10-SC42	372541.8912	1302943.997	Subsurface Core - D/F and PCB Congener Analysis
JW-EA06-SC28	373174.556	1302470.872	Archived Subsurface Core
JW-EA09-SC39	372407.169	1302892.674	Archived Subsurface Core
JW-212SC	371830.0449	1302498.207	Archived Subsurface Core

Notes:

1 = Submit existing archive surface sediment

Horizontal Datum: Washington State Plane North, North American Datum of 1983 (NAD 83) feet

D/F = dioxin/furan

PCB = polychlorinated biphenyl

FIGURES



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- Previous Dioxin/Furan Sampled Surface Sediment Locations
- Stormwater Outfall
- Jeld-Wen Outfall
- Bathymetric Contours (2ft Interval)
- parcels

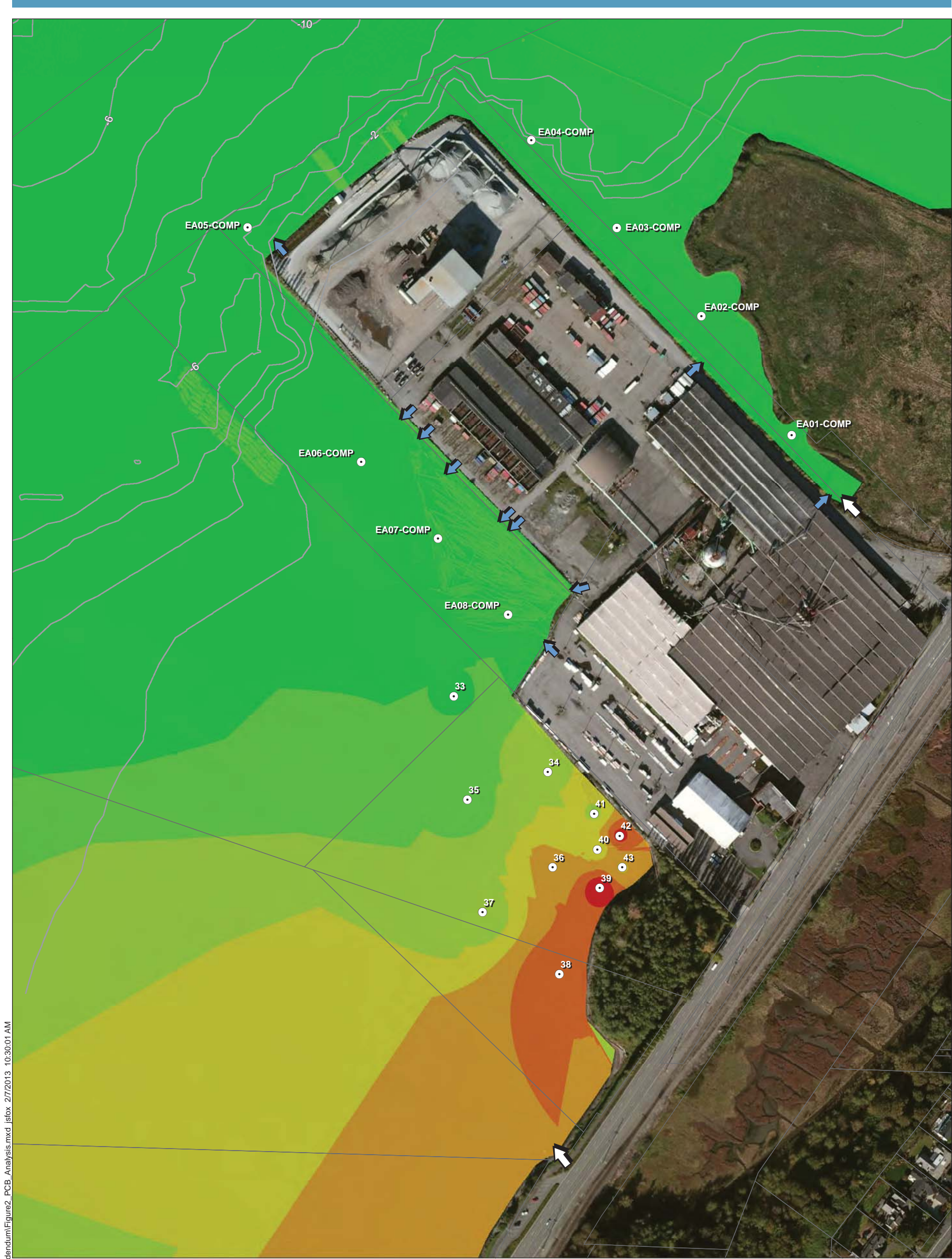
Dioxin/Furan TEQ IDW Analysis	
Estimated Value (ng/kg)	
	0 - 2
	2.1 - 5
	5.1 - 8
	8.1 - 12
	12.1 - 20
	20.1 - 40
	> 40

NOTES:
 1. Total dioxin/furan surface sediment results 2005 Toxic Equivalency (TEQ) for mammals where U=1/2
 2. Stations shown on figure are included in IDW interpolation.



Figure 1
 Dioxin/Furan TEQ Dry Weight IDW Analysis
 Quality Assurance Project Plan Addendum
 Jeld-Wen Former Nord Door Facility





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<ul style="list-style-type: none"> ○ Previous PCB Sampled Surface Sediment Location PCB-oc Dry Weight IDW Analysis Estimated Concentration (mg/kg) 0 - 0.559 0.56 - 1.2 1.21 - 2 2.1 - 3 3.1 - 4 4.1 - 5 > 5 	<ul style="list-style-type: none"> ↑ Stormwater Outfall ↑ Jeld-Wen Outfall — Bathymetric Contours (2ft Interval) □ parcels
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NOTES:

1. Total Polychlorinated Biphenyls (PCB) congener surface sediment concentrations are Organic Carbon (OC) normalized where U=0
2. Stations shown on figure are included in IDW interpolation.

Feet

0 125 250 375 500

Figure 2
 Total PCB Congener IDW Analysis
 Quality Assurance Project Plan Addendum
 Jeld-Wen Former Nord Door Facility





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<ul style="list-style-type: none"> Previous Surface Sediment Location Previous Archived Surface Sediment Location Triggered for Analysis Proposed PCB Congener Surface Grab Proposed Dioxin and PCB Congener Surface Grab Proposed Dioxin Congener Surface Grab Proposed Archive Surface Grab Proposed Dioxin/Furan Core Location 	<ul style="list-style-type: none"> Proposed Dioxin/Furan and PCB Congener Core Location Archived Core Location Bathymetric Contours (2ft Interval) Parcels 	<ul style="list-style-type: none"> Stormwater Outfall Jeld-Wen Outfall
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Feet

0 125 250 375 500

Figure 3
 Proposed Sampling Locations
 Quality Assurance Project Plan Addendum
 Jeld-Wen Former Nord Door Facility

