Appendix G
Data Validation Report

LABORATORY DATA CONSULTANTS, INC.
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Anchor QEA, LLC
1201 Third Ave. Suite 2600
Seattle, WA 98101
ATTN: Ms. Delaney Peterson
dpeterson@anchorqea.com

December 8, 2023

SUBJECT: Jeld-Wen - Data Validation

Dear Ms. Peterson,

Enclosed are the final validation reports for the fraction listed below. This SDG was received on October 10, 2023. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #57680:

SDG #	Fraction
23H0001 23H0037	Polynuclear Aromatic Hydrocarbons, Polychlorinated Biphenyls, Wet Chemistry, Polychlorinated Dioxins/Dibenzofurans

The data validation was performed under Stage 2B & 4 guidelines. The analysis was validated using the following documents, as applicable to each method:

- Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023)
- USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020)
- USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (November 2020)
- USEPA National Functional Guidelines (NFG) for High Resolution Superfund Methods Data Review (November 2020)
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Stella Cuenco
scuenco@lab-data.com
Project Manager/Senior Chemist

56 pages-ADV

Attachment 1

Stage 2B (PCB & Diox 90/10) EDD

LDC# 57680 (Anchor Environmental-Seattle WA / Jeld-Wen)

LDC	SDG#	DATE REC'D	(3) DATE DUE	PAHs (8270E -SIM)		PCBs (8082A)		Dioxins (1613B)		Moist. Content (D2216)		Org. Matter (D2974)		Total Solids (D2216)																					
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	23H0001	10/10/23	10/31/23	0	8	0	3	0	6	0	11	0	11	0	3																				
B	23H0037	10/10/23	10/31/23	0	13	0	8	0	15	0	16	0	16	0	10																				
B	23H0037	10/10/23	10/31/23	0	0	0	2	0	3	0	0	0	0	0	0																				
Total	TR/SC			0	21	0	13	0	24	0	27	0	27	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	125

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS, MSD, or DUP's.

V:\LOGIN\Anchor\Jeld Wen\57680ST.wpd

LDC Report# 57680A2b

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: December 8, 2023

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0001

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-PDI-114-SG-0-1-20230731	23H0001-01	Soil	07/31/23
JW-PDI-070-SG-0-1-20230731	23H0001-02	Soil	07/31/23
JW-PDI-077-SG-0-1-20230731	23H0001-03	Soil	07/31/23
JW-PDI-076-SG-0-1-20230731	23H0001-05	Soil	07/31/23
JW-PDI-075-SG-0-1-20230731	23H0001-08	Soil	07/31/23
JW-PDI-074-SG-0-1-20230731	23H0001-10	Soil	07/31/23
JW-PDI-074-SG-0-1-20230731RE	23H0001-10DL	Soil	07/31/23
JW-PDI-074-SG-0-1-20230731REDL	23H0001-10REDL	Soil	07/31/23
JW-PDI-045-SG-0-1-20230731	23H0001-16	Soil	07/31/23
JW-PDI-074-SG-0-1-20230731MS	23H0001-10MS	Soil	07/31/23
JW-PDI-074-SG-0-1-20230731MSD	23H0001-10MSD	Soil	07/31/23

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270E in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Days From Sample Collection Until Extraction	Required Holding Time (in Days) From Sample Collection Until Extraction	Flag	A or P
JW-PDI-074-SG-0-1-20230731RE JW-PDI-074-SG-0-1-20230731REDL	All analytes	44	14	J (all detects)	A

II. GC/MS Instrument Performance Check

Instrument performance check was performed at the required frequency.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For analytes where average relative response factors (RRFs) were utilized, percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the analytes, all coefficients of determination (r^2) were greater than or equal to 0.990.

Average relative response factors (RRF) for all analytes were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all analytes.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all analytes with the following exceptions:

Date	Analyte	%D	Associated Samples	Flag	A or P
09/15/23	Acenaphthylene Benzo(b)fluoranthene	23.6 25.2	JW-PDI-114-SG-0-1-20230731 JW-PDI-070-SG-0-1-20230731 JW-PDI-077-SG-0-1-20230731 JW-PDI-076-SG-0-1-20230731 JW-PDI-075-SG-0-1-20230731 JW-PDI-074-SG-0-1-20230731 JW-PDI-045-SG-0-1-20230731	J (all detects) J (all detects)	A
09/21/23	Benzo(b)fluoranthene	22.8	JW-PDI-074-SG-0-1-20230731RE	J (all detects)	A
09/30/23	1-Methylnaphthalene Acenaphthylene Benzo(b)fluoranthene	23.2 28.4 32.8	JW-PDI-074-SG-0-1-20230731REDL	J (all detects) J (all detects) J (all detects)	A

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Analyte	Concentration (ug/Kg)	Associated Samples
BLH0158-MB	08/11/23	Naphthalene 2-Methylnaphthalene Acenaphthene Phenanthrene Fluoranthene Pyrene Benzo(b)fluoranthene	0.59 0.17 0.10 0.26 0.15 0.17 0.07	JW-PDI-114-SG-0-1-20230731 JW-PDI-070-SG-0-1-20230731 JW-PDI-077-SG-0-1-20230731 JW-PDI-076-SG-0-1-20230731 JW-PDI-075-SG-0-1-20230731 JW-PDI-074-SG-0-1-20230731 JW-PDI-045-SG-0-1-20230731
BLI0350-MB	09/14/23	Naphthalene 2-Methylnaphthalene 1-Methylnaphthalene Acenaphthylene Acenaphthene Dibenzofuran Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(j)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Benzo(g,h,i)perylene	55.2 18.4 7.69 12.2 1.86 14.5 15.7 58.7 20.5 20.0 17.8 5.81 6.21 2.35 1.91 1.90 2.68 1.07 0.33 1.34	JW-PDI-074-SG-0-1-20230731RE JW-PDI-074-SG-0-1-20230731REDL

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. Surrogate recoveries (%R) were not within QC limits for several samples. No data were qualified for samples analyzed at greater than or equal to 5X dilution.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were not within the QC limits for JW-PDI-074-SG-0-1-20230731MS/MSD. No data were qualified for MS/MSD samples analyzed greater than or equal to a 5X dilution. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Analyte	LCS %R (50-150)	LCSD %R (50-150)	Flag	A or P
BLI0350-LCS/LCSD (JW-PDI-074-SG-0-1-20230731RE JW-PDI-074-SG-0-1-20230731REDL)	Phenanthrene	176	-	J (all detects)	P

Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Target Analyte Quantitation

All target analyte quantitations met validation criteria with the following exceptions:

Sample	Analyte	Finding	Criteria	Flag	A or P
JW-PDI-074-SG-0-1-20230731RE	Naphthalene 2-Methylnaphthalene 1-Methylnaphthalene Acenaphthylene Dibenzofuran Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A

Raw data were not reviewed for Stage 2B validation.

XIII. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

In the case where more than one result was reported for an individual sample, the least technically acceptable results were deemed not reportable as follows:

Sample	Analyte	Reason	Flag	A or P
JW-PDI-074-SG-0-1-20230731RE JW-PDI-074-SG-0-1-20230731REDL	All analytes	Reextracted outside holding time.	Not reportable	-

Data qualified due to continuing calibration %D are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 23H0001

Sample	Analyte	Flag	A or P	Reason (Code)
JW-PDI-114-SG-0-1-20230731 JW-PDI-070-SG-0-1-20230731 JW-PDI-077-SG-0-1-20230731 JW-PDI-076-SG-0-1-20230731 JW-PDI-075-SG-0-1-20230731 JW-PDI-074-SG-0-1-20230731 JW-PDI-045-SG-0-1-20230731	Acenaphthylene Benzo(b)fluoranthene	J (all detects) J (all detects)	A	Continuing calibration (%D) (5)
JW-PDI-074-SG-0-1-20230731RE JW-PDI-074-SG-0-1-20230731REDL	All analytes	Not reportable	-	Overall assessment of data (22)

Jeld-Wen
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 23H0001

No Sample Data Qualified in this SDG

LDC #: 57680A2b

VALIDATION COMPLETENESS WORKSHEET

SDG #: 23H0001

Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA

Date: 11/10/23

Page: 1 of 1

Reviewer: PT

2nd Reviewer:

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW-846 Method 8270E-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / SW	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	%RSD ≤ 20, r² ICV ≤ 30
IV.	Continuing calibration	SW	CCV ≤ 20
V.	Laboratory Blanks	SW	
VI.	Field blanks	N	
VII.	Surrogate spikes	SW	
VIII.	Matrix spike/Matrix spike duplicates	SW	
IX.	Laboratory control samples	SW	LCSID
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Target analyte quantitation	SW	
XIII.	Target analyte identification	N	
XIV	Overall assessment of data	SW	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID		Lab ID	Matrix	Date
1 1	JW-PDI-114-SG-0-1-20230731		23H0001-01	Soil	07/31/23
2 1	JW-PDI-070-SG-0-1-20230731		23H0001-02	Soil	07/31/23
3 1	JW-PDI-077-SG-0-1-20230731		23H0001-03	Soil	07/31/23
4 1	JW-PDI-076-SG-0-1-20230731		23H0001-05	Soil	07/31/23
5 1	JW-PDI-075-SG-0-1-20230731		23H0001-08	Soil	07/31/23
6 1	JW-PDI-074-SG-0-1-20230731 ~~DL~~	10x	23H0001-10	Soil	07/31/23
7 1	JW-PDI-074-SG-0-1-20230731~~DL~~ RE	1x	23H0001-10DL	Soil	07/31/23
8 1	JW-PDI-045-SG-0-1-20230731		23H0001-16	Soil	07/31/23
9 1	JW-PDI-074-SG-0-1-20230731MS		23H0001-10MS	Soil	07/31/23
10 1	JW-PDI-074-SG-0-1-20230731MSD		23H0001-10MSD	Soil	07/31/23
11 1	#7 DL	10x			

Notes:

	BLH0148-MB						
2 2	~~BLI0358-MB~~	BL	H0158-BLK1				
3	BLI0350-MB						

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	CC. Dimethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	GGGG. C30-Hopane	I1. Methyl methanesulfonate
B. Bis (2-chloroethyl) ether	DD. Acenaphthylene	FFF. Di-n-octylphthalate	HHHH. 1-Methylphenanthrene	J1. Ethyl methanesulfonate
C. 2-Chlorophenol	EE. 2,6-Dinitrotoluene	GGG. Benzo(b)fluoranthene	IIII. 1,4-Dioxane	K1. o,o',o"-Triethylphosphorothioate
D. 1,3-Dichlorobenzene	FF. 3-Nitroaniline	HHH. Benzo(k)fluoranthene	JJJJ. Acetophenone	L1. n-Phenylene diamine
E. 1,4-Dichlorobenzene	GG. Acenaphthene	III. Benzo(a)pyrene	KKKK. Atrazine	M1. 1,4-Naphthoquinone
F. 1,2-Dichlorobenzene	HH. 2,4-Dinitrophenol	JJJ. Indeno(1,2,3-cd)pyrene	LLLL. Benzaldehyde	N1. N-Nitro-o-toluidine
G. 2-Methylphenol	II. 4-Nitrophenol	KKK. Dibenz(a,h)anthracene	MMMM. Caprolactam	O1. 1,3,5-Trinitrobenzene
H. 2,2'-Oxybis(1-chloropropane)	JJ. Dibenzofuran	LLL. Benzo(g,h,i)perylene	NNNN. 2,6-Dichlorophenol	P1. Pentachlorobenzene
I. 4-Methylphenol	KK. 2,4-Dinitrotoluene	MMM. Bis(2-Chloroisopropyl)ether	OOOO. 1,2-Diphenylhydrazine	Q1. 4-Aminobiphenyl
J. N-Nitroso-di-n-propylamine	LL. Diethylphthalate	NNN. Aniline	PPPP. 3-Methylphenol	R1. 2-Naphthylamine
K. Hexachloroethane	MM. 4-Chlorophenyl-phenyl ether	OOO. N-Nitrosodimethylamine	QQQQ. 3&4-Methylphenol	S1. Triphenylene
L. Nitrobenzene	NN. Fluorene	PPP. Benzoic Acid	RRRR. 4-Dimethyldibenzothiophene (4MDT)	T1. Octachlorostyrene
M. Isophorone	OO. 4-Nitroaniline	QQQ. Benzyl alcohol	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	U1. Famphur
N. 2-Nitrophenol	PP. 4,6-Dinitro-2-methylphenol	RRR. Pyridine	TTTT. 1-Methyldibenzothiophene (1MDT)	V1. 1,4-phenylenediamine
O. 2,4-Dimethylphenol	QQ. N-Nitrosodiphenylamine	SSS. Benzidine	UUUU.. 2,3,4,6-Tetrachlorophenol	W1. Methapyrilene
P. Bis(2-chloroethoxy)methane	RR. 4-Bromophenyl-phenylether	TTT. 1-Methylnaphthalene	VVVV. 1,2,4,5-Tetrachlorobenzene	X1. Pentachloroethane
Q. 2,4-Dichlorophenol	SS. Hexachlorobenzene	UUU.Benzo(b)thiophene	WWWW.. 2-Picoline	Y1. 3,3'-Dimethylbenzidine
R. 1,2,4-Trichlorobenzene	TT. Pentachlorophenol	VVV.Benzonaphthothiophene	XXXX. 3-Methylcholanthrene	Z1. o-Toluidine
S. Naphthalene	UU. Phenanthrene	WWW.Benzo(e)pyrene	YYYY. a,a-Dimethylphenethylamine	A2. 1-Naphthylamine
T. 4-Chloroaniline	VV. Anthracene	XXX. 2,6-Dimethylnaphthalene	ZZZZ. Hexachloropropene	B2. 4-Aminobiphenyl
U. Hexachlorobutadiene	WW. Carbazole	YYY. 2,3,5-Trimethylnaphthalene	A1. N-Nitrosodiethylamine	C2. 4-Nitroquinoline-1-oxide
V. 4-Chloro-3-methylphenol	XX. Di-n-butylphthalate	ZZZ. Perylene	B1. N-Nitrosodi-n-butylamine	D2. Hexachloropene
W. 2-Methylnaphthalene	YY. Fluoranthene	AAAA. Dibenzothiophene	C1. N-Nitrosomethylethylamine	E2. Bis (2-chloro-1-methylethyl) ether
X. Hexachlorocyclopentadiene	ZZ. Pyrene	BBBB. Benzo(a)fluoranthene	D1. N-Nitrosomorpholine	F2. Bifenthrin
Y. 2,4,6-Trichlorophenol	AAA. Butylbenzylphthalate	CCCC. Benzo(b)fluorene	E1. N-Nitrosopyrrolidine	G2. Cyfluthrin
Z. 2,4,5-Trichlorophenol	BBB. 3,3'-Dichlorobenzidine	DDDD. cis/trans-Decalin	F1. Phenacetin	H2. Cypermethrin
AA. 2-Chloronaphthalene	CCC. Benzo(a)anthracene	EEEE. 1,1'-Biphenyl	G1. 2-Acetylaminofluorene	I2. Permethrin (cis/trans)
BB. 2-Nitroaniline	DDD. Chrysene	FFFF. Retene	H1. Pronamide	J2. 5-Nitro-o-toluidine

J3. Benzo(j) fluoranthene

LDC #: 57680A2b

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: FT

All circled dates have exceeded the technical holding times.
(Y) N N/A Were all cooler temperatures within validation criteria? (1)

METHOD : GC/MA BNA SW846 METHOD 8270

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
7, 11	SOIL		7/31/23	9/14/23	9/21-9/30/23	44	J/R/A
							All detect
			Holding time from sampling date to extraction date = 14 days				
			7 + 11 was re-extracted				
			from a frozen volume				

TECHNICAL HOLDING TIME CRITERIA

Water: Extracted within 7 days, analyzed within 40 days.
Soil: Extracted within 14 days, analyzed within 40 days.

LDC #: 57680A26

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270 F)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument?

(Y) N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?

Y (N) N/A Were all %D and RRFs within the validation criteria of ≤20%D and ≥0.05 RRF ? (5)

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	9/15/23	SLI0220	DD	23.6		1→6, 8→10,	Jdw/A all Det
	1211	-ICV1	GGG	25.2		BLHG158-MB	Jdw/A ↓
	9/21/23	SLI0312	GGG	22.8		7, BLI0350-MB	Jdw/A Det
	0958	-ICV1					
	9/30/23	SLI0483	TTT	23.2		11 ↓	Jdw/A all Det ↓
	1942	-ICV2	DD	28.4			
			GGG	32.8			

LDC #: 57680A2b

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270E SIM

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

K N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

(7)

Blank extraction date: 8/11/23 **Blank analysis date:** 9/5/23

Conc. units: ug/Kg Associated Samples: 1 → 6, 8 → 75X

Compound	Blank ID	Sample Identification								
	BLH0158-MB 5X									
S	0.59	2.95								
W	0.17	0.85								
GG	0.10	0.5								
UU	0.26	1.3								
YY	0.15	0.75								
ZZ	0.17	0.85								
GGG	0.07	0.35								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 57680A2b

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270 E)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

(7)

Blank extraction date: 9/14/23 **Blank analysis date:** 9/21/23
Conc. units: ug/Kg Associated Samples: 7, 11

Compound	Blank ID	Sample Identification									
	BLI0350	MB	11 (1X)	Using FT, FF not used for evaluation							
S	55.2		440U								
W	18.4		98.7U								
TTT	7.69		55.7U								
DD	12.2		86.2U								
GG	1.86		41.1U								
JJ	14.5		79.7U								
NN	15.7		86.4U								
UU	58.7		375U								
VV	20.5		102U								
YY	20.0		364U								
ZZ	17.8		334U								
CCC	5.81		85.0U								
DDD	6.21		104U								
GGG	2.35		77.5U								
HHH	1.91		37.2U								
JJJ	1.90		36.3U								
III	2.68		52.0U								
JJJ	1.07		23.8U								
KKK	0.33		4.62U								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 57680A2b

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270 E)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

K N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

(7)

Blank extraction date: 9/14/23 **Blank analysis date:** 9/21/23

Conc. units: ug/Kg Associated Samples: 7, 11

Compound	Blank ID	Sample Identification								
	BLI0350-MB		~~11 (10X)~~							
LLL	1.34		~~35.5U~~							

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 57680A2b

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270E) SIM

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y [✓ N] N/A Were percent recoveries (%R) for surrogates within QC limits?
Y N [✓ N/A] If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
Y N [✓ N/A] If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

(13)

#	Sample ID	Surrogate	%R (Limits)	Qualifications
	1, 2, 3, 4, 5, 6, 8	surrogates outside limit	( )	NR, ≥ 5x DL
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
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			( )	
			( )	
			( )	
			( )	
			( )	

(NBZ) = Nitrobenzene - d5
(FBP) = 2-Fluorobiphenyl
(TPH) = Terphenyl - d14
(2FP) = 2-Fluorophenol
(TBP) = 2,4,6 -Tribromophenol
(2CP) = 2-Chlorophenol - d4

LDC #: 57680A2b

VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: FT

METHOD: GCMS VOA (EPA SW 846 Method 8270 E) SIM

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
[✓ Y] N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

(8)

#	MS/MSD ID	Compound	MS %Recovery	MSD %Recovery	MS/MSD %Recovery Limits	RPD (Limits)	Associated Samples	Qualifications
	9 & 10	several	% R outside limit			( )	6, 7, 11	NQ, ≥5X DL
						( )		
						( )		
						( )		
						( )		
						( )		
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LDC #: 57680A2b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: FT

METHOD: GC/MS SVOA (EPA SW 846 Method 8270 E)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y [✓ N] N/A Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?

Level IV/D Only

Y N [✓ N/A] Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

(10)

LCS/LCSD ID	Compound	LCS % Recovery	LCSD % Recovery	LCS/LCSD %Recovery limits	RPD (Limits)	Associated Samples	Qualifications
BLI0350-	UU	176		50-150	( )	7, 11,	J dets/P All Det
LCS ID		↓			( )	BLI0350-MB	
				↓	( )		
		176			( )		
					( )		
					( )		
					( )		
					( )		
					( )		
					( )		
					( )		
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					( )		
					( )		
					( )		

LDC #: 57680A2b

VALIDATION FINDINGS WORKSHEET
Target Analytes Quantitation and CRQLs

Reviewer: FT

METHOD: GC/MS SVOA (EPA SW 846 Method 8270 E SIM

(20)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?

Y N N/A Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?

#	Sample ID	Compound	Finding	Qualifications
	7	S, W, TTT, DD, JJ, NN, UU, VV, YY, ZZ, CCC, DDD, GGG	x'd cal Range	Jdet / Δ

Comments: See sample calculation verification worksheet for recalculations

LDC #: 57680A2b

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: 1 of 1
Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270 5)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

(Y) N N/A Was the overall quality and usability of the data acceptable?

#	Sample ID	Compound	Finding	Qualifications
	7, 11	All	re-extracted using a frozen volume, outside a holding time of 14 days	NR/A

Comments: _____

OVR.wpd

LDC Report# 57680A3b

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: November 14, 2023

Parameters: Polychlorinated Biphenyls

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0001

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-PDI-114-SG-0-1-20230731	23H0001-01	Soil	07/31/23
JW-PDI-070-SG-0-1-20230731	23H0001-02	Soil	07/31/23
JW-PDI-045-SG-0-1-20230731	23H0001-16	Soil	07/31/23
JW-PDI-045-SG-0-1-20230731MS	23H0001-16MS	Soil	07/31/23
JW-PDI-045-SG-0-1-20230731MSD	23H0001-16MSD	Soil	07/31/23

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all analytes.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all analytes.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all analytes.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Surrogates/Internal Standards

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Column	Surrogate	%R (53-120)	Affected Analyte	Flag	A or P
JW-PDI-070-SG-0-1-20230731	Col. 1	Tetrachloro-m-xylene	50.8	All analytes	J (all detects) UJ (all non-detects)	P

All internal standard areas and retention times were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Target Analyte Quantitation

Raw data were not reviewed for Stage 2B validation.

XI. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Data qualified due to surrogate %R are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polychlorinated Biphenyls - Data Qualification Summary - SDG 23H0001

Sample	Analyte	Flag	A or P	Reason (Code)
JW-PDI-070-SG-0-1-20230731	All analytes	J (all detects) UJ (all non-detects)	P	Surrogates (%R) (13)

Jeld-Wen
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG 23H0001

No Sample Data Qualified in this SDG

LDC #: 57680A3b

SDG #: 23H0001

Laboratory: Analytical Resources, Inc., Tukwila, WA

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

Date: 11/10/23

Page: 1 of 1

Reviewer: FT

2nd Reviewer: AC

METHOD: GC Polychlorinated Biphenyls (EPA SW-846 Method 8082A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	
III.	Continuing calibration	A	%RSD ≤ 20 ICV ≤ 20 CCV ≤ 20
IV.	Laboratory Blanks	A	
V.	Field blanks	N	
VI.	Surrogate spikes 1/5	SW	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS 1D
IX.	Field duplicates	N	
X.	Target analyte quantitation	N	
XI.	Target analyte identification	N	
XII	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1 +	JW-PDI-114-SG-0-1-20230731	23H0001-01	Soil	07/31/23
2 +	JW-PDI-070-SG-0-1-20230731	23H0001-02	Soil	07/31/23
3 +	JW-PDI-045-SG-0-1-20230731	23H0001-16	Soil	07/31/23
4	JW-PDI-045-SG-0-1-20230731MS	23H0001-16MS	Soil	07/31/23
5	JW-PDI-045-SG-0-1-20230731MSD	23H0001-16MSD	Soil	07/31/23
6				
7				
8				
9				
10				
11				
12				
13				

Notes:

	BLH0165 - MB						

LDC #: 57680 A3b

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: FT

METHOD: ✓ GC ___ HPLC

Are surrogates required by the method? Yes___ or No___.

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were surrogates spiked into all samples and blanks?

Y N N/A Did all surrogate recoveries (%R) meet the QC limits?

13

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	2	col 1	Y	50.8 (53-120)	J/UJ/P ND+ Det
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
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				( )	
				( )	
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				( )	
				( )	
				( )	
				( )	
				( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	Chloro-octadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-Dichlorophenylacetic acid
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate	CC	2,5-Dibromotoluene
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC Report# 57680A6

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: November 2, 2023

Parameters: Wet Chemistry

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA/
Materials Testing & Consulting, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0001/23B014-13

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-PDI-114-SG-0-1-20230731	23H0001-01/B23-0682	Soil	07/31/23
JW-PDI-070-SG-0-1-20230731	23H0001-02/B23-0685	Soil	07/31/23
JW-PDI-077-SG-0-1-20230731	23H0001-03/B23-0686	Soil	07/31/23
JW-PDI-069-SG-0-1-20230731	23H0001-04/B23-0687	Soil	07/31/23
JW-PDI-076-SG-0-1-20230731	23H0001-05/B23-0688	Soil	07/31/23
JW-PDI-068-SG-0-1-20230731	23H0001-06/B23-0689	Soil	07/31/23
JW-PDI-067-SG-0-1-20230731	23H0001-07/B23-0690	Soil	07/31/23
JW-PDI-075-SG-0-1-20230731	23H0001-08/B23-0691	Soil	07/31/23
JW-PDI-074-SG-0-1-20230731	23H0001-10/B23-0692	Soil	07/31/23
JW-PDI-066-SG-0-1-20230731	23H0001-11/B23-0693	Soil	07/31/23
JW-PDI-045-SG-0-1-20230731	23H0001-16/B23-0695	Soil	07/31/23
JW-PDI-114-SG-0-1-20230731DUP	23H0001-01/B23-0683DUP	Soil	07/31/23
JW-PDI-114-SG-0-1-20230731TRP	23H0001-01/B23-0684TRP	Soil	07/31/23

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Moisture Content by American Society for Testing and Material (ASTM) C556 and ASTM D2216
Organic Matter by ASTM D2974
Total Solids by ASTM D2216

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

Initial calibration analysis was not required by the methods.

III. Continuing Calibration

Continuing calibration frequency and analysis was not required by the methods.

IV. Laboratory Blanks

Laboratory blank analysis was not required by the methods.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the methods.

VII. Triplicate Sample Analysis

Triplicate (TRP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were not required by the methods.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Target Analyte Quantitation

Raw data were not reviewed for Stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Jeld-Wen
Wet Chemistry - Data Qualification Summary - SDG 23H0001/23B014-13

No Sample Data Qualified in this SDG

Jeld-Wen
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 23H0001/23B014-13

No Sample Data Qualified in this SDG

LDC #: 57680A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/1/23
SDG #: 23H0001/23B014-13 Stage 2B Page: 1 of 1
Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer: NF
Sub-Laboratory: Materials Testing & Consulting, Inc., Tukwila, WA 2nd Reviewer: AC

METHOD: (Analyte) Moisture Content (ASTM C556/ASTM D2216), Organic Matter (ASTM D2974), Total Solids (ASTM D2216)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II	Initial calibration	N	
III.	Calibration verification	N	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	N	
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	N	
IX.	Field duplicates	N	
X.	Target Analyte Quantitation	N	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Sub-Lab ID	Lab ID	Matrix	Date
1	JW-PDI-114-SG-0-1-20230731	B23-0682	23H0001-01	Soil	07/31/23
2	JW-PDI-070-SG-0-1-20230731	B23-0685	23H0001-02	Soil	07/31/23
3	JW-PDI-077-SG-0-1-20230731	B23-0686	23H0001-03	Soil	07/31/23
4	JW-PDI-069-SG-0-1-20230731	B23-0687	23H0001-04	Soil	07/31/23
5	JW-PDI-076-SG-0-1-20230731	B23-0688	23H0001-05	Soil	07/31/23
6	JW-PDI-068-SG-0-1-20230731	B23-0689	23H0001-06	Soil	07/31/23
7	JW-PDI-067-SG-0-1-20230731	B23-0690	23H0001-07	Soil	07/31/23
8	JW-PDI-075-SG-0-1-20230731	B23-0691	23H0001-08	Soil	07/31/23
9	JW-PDI-074-SG-0-1-20230731	B23-0692	23H0001-10	Soil	07/31/23
10	JW-PDI-066-SG-0-1-20230731	B23-0693	23H0001-11	Soil	07/31/23
11	JW-PDI-045-SG-0-1-20230731	B23-0695	23H0001-16	Soil	07/31/23
12	JW-PDI-114-SG-0-1-20230731DUP	B23-0683	23H0001-01DUP	Soil	07/31/23
13	JW-PDI-114-SG-0-1-20230731TRP	B23-0684	23H0001-01TRP	Soil	07/31/23
14					
15					

Notes:

Sample Specific Element Reference Reviewer: NF

All elements are applicable to each sample as noted below.

Sample ID	Target Analyte List
1-11	Moisture Content, Organic Matter
1-2, 11	Total Solids
QC	
12-13	Moisture Content, Organic Matter

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: November 14, 2023

Parameters: Polychlorinated Dioxins/Dibenzofurans

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0001

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-PDI-114-SG-0-1-20230731	23H0001-01	Soil	07/31/23
JW-PDI-070-SG-0-1-20230731	23H0001-02	Soil	07/31/23
JW-PDI-047-SG-0-1-20230731	23H0001-09	Soil	07/31/23
JW-PDI-042-SG-0-1-20230731	23H0001-13	Soil	07/31/23
JW-PDI-044-SG-0-1-20230731	23H0001-14	Soil	07/31/23
JW-PDI-045-SG-0-1-20230731	23H0001-16	Soil	07/31/23
JW-PDI-114-SG-0-1-20230731DUP	23H0001-01DUP	Soil	07/31/23

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for High Resolution Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Dioxins/Dibenzofurans by Environmental Protection Agency (EPA) Method 1613B

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25%.

The static resolving power was at least 10,000 (10% valley definition).

III. Initial Calibration and Initial Calibration Verification

A five point initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all analytes and less than or equal to 30.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were within the QC limits for all analytes and labeled compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration results were within the QC limits for all analytes and labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Analyte	Concentration (ng/Kg)	Associated Samples
BLH0132-MB	08/07/23	OCDD	3.48	All samples in SDG 23H0001

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates/Duplicate Sample Analysis

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Labeled Compounds

All percent recoveries (%R) for labeled compounds used to quantitate target analytes were within QC limits.

XI. Target Analyte Quantitation

All target analyte quantitations were within validation criteria with the following exceptions:

Sample	Analyte	Flag	A or P
All samples in SDG 23H0001	All analytes reported by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A

Raw data were not reviewed for Stage 2B validation.

XII. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Data qualified due to results reported by the laboratory as EMPCs are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Data Qualification Summary - SDG 23H0001

Sample	Analyte	Flag	A or P	Reason (Code)
JW-PDI-114-SG-0-1-20230731 JW-PDI-070-SG-0-1-20230731 JW-PDI-047-SG-0-1-20230731 JW-PDI-042-SG-0-1-20230731 JW-PDI-044-SG-0-1-20230731 JW-PDI-045-SG-0-1-20230731	All analytes reported by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A	Target analyte quantitation (EMPC) (23)

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG 23H0001

No Sample Data Qualified in this SDG

LDC #: 57680A21 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/10/23
SDG #: 23H0001 Stage 2B Page: 1 of 1
Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer: EK
2nd Reviewer:

METHOD: HRGC/HRMS Polychlorinated Dioxins/Dibenzofurans (EPA Method 1613B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	%RSD ≤ 20/30 ICV = QC limit
IV.	Continuing calibration	A	CCV = QC limit
V.	Laboratory Blanks	SW	
VI.	Field blanks	N	
VII.	Matrix spike/Matrix spike duplicates /DUP	N/A	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Labeled Compounds	A	
XI.	Target analyte quantitation	SW	
XII.	Target analyte identification	N	
XIII	Overall assessment of data	A	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank
SB=Source blank
OTHER:

	Client ID	Lab ID	Matrix	Date
1	JW-PDI-114-SG-0-1-20230731	23H0001-01	Soil	07/31/23
2	JW-PDI-070-SG-0-1-20230731	23H0001-02	Soil	07/31/23
3	JW-PDI-047-SG-0-1-20230731	23H0001-09	Soil	07/31/23
4	JW-PDI-042-SG-0-1-20230731	23H0001-13	Soil	07/31/23
5	JW-PDI-044-SG-0-1-20230731	23H0001-14	Soil	07/31/23
6	JW-PDI-045-SG-0-1-20230731	23H0001-16	Soil	07/31/23
7	JW-PDI-114-SG-0-1-20230731DUP	23H0001-01DUP	Soil	07/31/23
8				
9				
10				
11				

Notes:

	BLH0132 - MB						

Note ≤ 35% RPD criteria for lab Dup

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290A/1613B

A. 2,3,7,8-TCDD	F. 1,2,3,4,6,7,8-HpCDD	K. 1,2,3,4,7,8-HxCDF	P. 1,2,3,4,7,8,9-HpCDF	U. Total HpCDD
B. 1,2,3,7,8-PeCDD	G. OCDD	L. 1,2,3,6,7,8-HxCDF	Q. OCDF	V. Total TCDF
C. 1,2,3,4,7,8-HxCDD	H. 2,3,7,8-TCDF	M. 2,3,4,6,7,8-HxCDF	R. Total TCDD	W. Total PeCDF
D. 1,2,3,6,7,8-HxCDD	I. 1,2,3,7,8-PeCDF	N. 1,2,3,7,8,9-HxCDF	S. Total PeCDD	X. Total HxCDF
E. 1,2,3,7,8,9-HxCDD	J. 2,3,4,7,8-PeCDF	O. 1,2,3,4,6,7,8-HpCDF	T. Total HxCDD	Y. Total HpCDF

Notes:_____

LDC #: 57680A21

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: ET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290A/1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

X N N/A Were all samples associated with a method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
Y N N/A Was the method blank contaminated?

Blank extraction date: 8/7/23 **Blank analysis date:** 9/5/23 **Associated samples:** All 7 5X

Conc. units: ng/Kg

Compound	Blank ID	Sample Identification								
	BLH0132-MB									
G	3.48									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 57680 A2J

VALIDATION FINDINGS WORKSHEET
Target Analytes Quantitation

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290) /1613B

(23)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the compound?
Y N N/A Compound quantitation and CRQLs were adjusted to reflect all sample dilutions and dry weight factors (if necessary).

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		All	all analytes qualified as EMPC by the lab		Jdet / Δ

Comments: See sample calculation verification worksheet for recalculations

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: November 14, 2023

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0037

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-PDI-118-SG-0-1-20230801	23H0037-04	Soil	08/01/23
JW-PDI-117-SG-0-1-20230801	23H0037-06	Soil	08/01/23
JW-PDI-073-SG-0-1-20230801	23H0037-08	Soil	08/01/23
JW-PDI-056-SG-0-1-20230801	23H0037-09	Soil	08/01/23
JW-PDI-040-SG-0-1-20230801	23H0037-10	Soil	08/01/23
JW-PDI-072-SG-0-1-20230801	23H0037-11	Soil	08/01/23
JW-PDI-071-SG-0-1-20230801	23H0037-12	Soil	08/01/23
JW-PDI-1071-SG-0-1-20230801	23H0037-13	Soil	08/01/23
JW-PDI-054-SG-0-1-20230801	23H0037-16	Soil	08/01/23
JW-PDI-059-SG-0-1-20230801	23H0037-21	Soil	08/01/23
JW-PDI-038-SG-0-1-20230801	23H0037-22	Soil	08/01/23
JW-PDI-039-SG-0-1-20230801	23H0037-23	Soil	08/01/23
JW-PDI-058-SG-0-1-20230801	23H0037-24	Soil	08/01/23
JW-PDI-117-SG-0-1-20230801MS	23H0037-06MS	Soil	08/01/23
JW-PDI-117-SG-0-1-20230801MSD	23H0037-06MSD	Soil	08/01/23

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270E in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check was performed at the required frequency.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For analytes where average relative response factors (RRFs) were utilized, percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the analytes, all coefficients of determination (r^2) were greater than or equal to 0.990.

Average relative response factors (RRF) for all analytes were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all analytes.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all analytes.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Analyte	Concentration (ug/Kg)	Associated Samples
BLH0293-MB	08/14/23	Acenaphthene	0.11	All samples in SDG 23H0037
		Dibenzofuran	0.16	
		Fluorene	0.38	
		Phenanthrene	2.62	
		Anthracene	0.96	
		Fluoranthene	3.52	
		Pyrene	2.47	
		Benzo(a)anthracene	1.23	
		Chrysene	1.21	
		Benzo(b)fluoranthene	0.91	
		Benzo(k)fluoranthene	0.69	
		Benzo(j)fluoranthene	0.68	
		Benzo(a)pyrene	0.70	
		Indeno(1,2,3-cd)pyrene	0.31	
		Benzo(g,h,i)perylene	0.41	

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. Surrogate recoveries (%R) were not within QC limits for several samples. No data were qualified for samples analyzed at greater than or equal to 5X dilution.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) and relative percent differences (RPD) were not within the QC limits for JW-PDI-117-SG-0-1-20230801MS/MSD. No data were qualified for MS/MSD samples analyzed greater than or equal to a 5X dilution.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Analyte	LCS %R (50-150)	LCSD %R (50-150)	Flag	A or P
BLH0293-LCS/LCSD (All samples in SDG 23H0037)	Naphthalene	44.7	-	J (all detects)	P
	2-Methylnaphthalene	44.1	-	J (all detects)	
	1-Methylnaphthalene	48.8	-	J (all detects)	
	Acenaphthylene	44.6	-	J (all detects)	
	Acenaphthene	41.9	-	J (all detects)	
	Dibenzofuran	45.6	-	J (all detects)	
	Anthracene	46.5	-	J (all detects)	
	Benzo(a)pyrene	42.4	-	J (all detects)	
	Indeno(1,2,3-cd)pyrene	37.0	-	J (all detects)	
	Dibenzo(a,h)anthracene	34.8	-	J (all detects)	
	Benzo(g,h,i)perylene	39.5	-	J (all detects)	

Relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Analyte	RPD (≤35)	Flag	A or P
BLH0293-LCS/LCSD (All samples in SDG 23H0037)	Naphthalene	58.7	J (all detects)	P
	2-Methylnaphthalene	62.2	J (all detects)	
	1-Methylnaphthalene	58.2	J (all detects)	
	Acenaphthylene	60.9	J (all detects)	
	Acenaphthene	65.4	J (all detects)	
	Dibenzofuran	57.1	J (all detects)	
	Fluorene	58.6	J (all detects)	
	Phenanthrene	55.0	J (all detects)	
	Anthracene	54.1	J (all detects)	
	Fluoranthene	47.2	J (all detects)	
	Pyrene	48.9	J (all detects)	
	Benzo(a)anthracene	50.5	J (all detects)	
	Chrysene	51.4	J (all detects)	
	Benzo(b)fluoranthene	46.1	J (all detects)	
	Benzo(k)fluoranthene	58.3	J (all detects)	
	Benzo(j)fluoranthene	45.4	J (all detects)	
	Benzo(a)pyrene	52.0	J (all detects)	
	Indeno(1,2,3-cd)pyrene	50.7	J (all detects)	
	Dibenzo(a,h)anthracene	53.8	J (all detects)	
	Benzo(g,h,i)perylene	48.6	J (all detects)	

X. Field Duplicates

Samples JW-PDI-071-SG-0-1-20230801 and JW-PDI-1071-SG-0-1-20230801 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/Kg)		RPD
	JW-PDI-071-SG-0-1-20230801	JW-PDI-1071-SG-0-1-20230801	
Naphthalene	91.6	101	10
2-Methylnaphthalene	25.1	26.2	4
1-Methylnaphthalene	14.8	15.1	2
Acenaphthylene	14.2	15.2	7
Acenaphthene	17.2	16.2	6
Dibenzofuran	23.6	25.5	8
Fluorene	24.9	24.5	2
Phenanthrene	109	121	10
Anthracene	40.9	43.3	6

Analyte	Concentration (ug/Kg)		RPD
	JW-PDI-071-SG-0-1-20230801	JW-PDI-1071-SG-0-1-20230801	
Fluoranthene	199	203	2
Pyrene	174	179	3
Benzo(a)anthracene	46.8	42.0	11
Chrysene	55.4	56.0	1
Benzo(b)fluoranthene	42.4	40.0	6
Benzo(k)fluoranthene	21.6	20.6	5
Benzo(j)fluoranthene	21.3	20.8	2
Benzo(a)pyrene	27.5	25.9	6
Indeno(1,2,3-cd)pyrene	12.4	12.7	2
Dibenzo(a,h)anthracene	3.06	2.56	18
Benzo(g,h,i)perylene	22.7	24.2	6

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Target Analyte Quantitation

Raw data were not reviewed for Stage 2B validation.

XIII. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Data qualified due to LCS/LCSD %R and RPD are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 23H0037

Sample	Analyte	Flag	A or P	Reason (Code)
JW-PDI-118-SG-0-1-20230801 JW-PDI-117-SG-0-1-20230801 JW-PDI-073-SG-0-1-20230801 JW-PDI-056-SG-0-1-20230801 JW-PDI-040-SG-0-1-20230801 JW-PDI-072-SG-0-1-20230801 JW-PDI-071-SG-0-1-20230801 JW-PDI-1071-SG-0-1-20230801 JW-PDI-054-SG-0-1-20230801 JW-PDI-059-SG-0-1-20230801 JW-PDI-038-SG-0-1-20230801 JW-PDI-039-SG-0-1-20230801 JW-PDI-058-SG-0-1-20230801	Naphthalene 2-Methylnaphthalene 1-Methylnaphthalene Acenaphthylene Acenaphthene Dibenzofuran Anthracene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Benzo(g,h,i)perylene	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P	Laboratory control samples (%R) (10)
JW-PDI-118-SG-0-1-20230801 JW-PDI-117-SG-0-1-20230801 JW-PDI-073-SG-0-1-20230801 JW-PDI-056-SG-0-1-20230801 JW-PDI-040-SG-0-1-20230801 JW-PDI-072-SG-0-1-20230801 JW-PDI-071-SG-0-1-20230801 JW-PDI-1071-SG-0-1-20230801 JW-PDI-054-SG-0-1-20230801 JW-PDI-059-SG-0-1-20230801 JW-PDI-038-SG-0-1-20230801 JW-PDI-039-SG-0-1-20230801 JW-PDI-058-SG-0-1-20230801	Naphthalene 2-Methylnaphthalene 1-Methylnaphthalene Acenaphthylene Acenaphthene Dibenzofuran Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(j)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Benzo(g,h,i)perylene	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)		Laboratory control samples (RPD) (10)

Jeld-Wen
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 23H0037

No Sample Data Qualified in this SDG

LDC #: 57680B2b **VALIDATION COMPLETENESS WORKSHEET** Date: 11/10/23
SDG #: 23H0037 Stage 2B Page: 1 of 1
Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer: EF
2nd Reviewer: AE

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW-846 Method 8270E-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	%RSD ≤ 20, r² ≥ 0.99 ICV ≤ 20
IV.	Continuing calibration	SW	CCV ≤ 20
V.	Laboratory Blanks	SW	
VI.	Field blanks	N	
VII.	Surrogate spikes	SW	
VIII.	Matrix spike/Matrix spike duplicates	SW	
IX.	Laboratory control samples	SW	LCS ID
X.	Field duplicates	SW	D - 7, 8
XI.	Internal standards	A	
XII.	Target analyte quantitation	N	
XIII.	Target analyte identification	N	
XIV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	JW-PDI-118-SG-0-1-20230801	23H0037-04	Soil	08/01/23
2	JW-PDI-117-SG-0-1-20230801	23H0037-06	Soil	08/01/23
3	JW-PDI-073-SG-0-1-20230801	23H0037-08	Soil	08/01/23
4	JW-PDI-056-SG-0-1-20230801	23H0037-09	Soil	08/01/23
5	JW-PDI-040-SG-0-1-20230801	23H0037-10	Soil	08/01/23
6	JW-PDI-072-SG-0-1-20230801	23H0037-11	Soil	08/01/23
7	JW-PDI-071-SG-0-1-20230801 D	23H0037-12	Soil	08/01/23
8	JW-PDI-1071-SG-0-1-20230801 D	23H0037-13	Soil	08/01/23
9	JW-PDI-054-SG-0-1-20230801	23H0037-16	Soil	08/01/23
10	JW-PDI-059-SG-0-1-20230801	23H0037-21	Soil	08/01/23
11	JW-PDI-038-SG-0-1-20230801	23H0037-22	Soil	08/01/23
12	JW-PDI-039-SG-0-1-20230801	23H0037-23	Soil	08/01/23
13	JW-PDI-058-SG-0-1-20230801	23H0037-24	Soil	08/01/23
14	JW-PDI-117-SG-0-1-20230801MS	23H0037-06MS	Soil	08/01/23
15	JW-PDI-117-SG-0-1-20230801MSD	23H0037-06MSD	Soil	08/01/23

BLH0293 - MB

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	CC. Dimethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	GGGG. C30-Hopane	I1. Methyl methanesulfonate
B. Bis (2-chloroethyl) ether	DD. Acenaphthylene	FFF. Di-n-octylphthalate	HHHH. 1-Methylphenanthrene	J1. Ethyl methanesulfonate
C. 2-Chlorophenol	EE. 2,6-Dinitrotoluene	GGG. Benzo(b)fluoranthene	IIII. 1,4-Dioxane	K1. o,o',o''-Triethylphosphorothioate
D. 1,3-Dichlorobenzene	FF. 3-Nitroaniline	HHH. Benzo(k)fluoranthene	JJJJ. Acetophenone	L1. n-Phenylene diamine
E. 1,4-Dichlorobenzene	GG. Acenaphthene	III. Benzo(a)pyrene	KKKK. Atrazine	M1. 1,4-Naphthoquinone
F. 1,2-Dichlorobenzene	HH. 2,4-Dinitrophenol	JJJ. Indeno(1,2,3-cd)pyrene	LLLL. Benzaldehyde	N1. N-Nitro-o-toluidine
G. 2-Methylphenol	II. 4-Nitrophenol	KKK. Dibenz(a,h)anthracene	MMMM. Caprolactam	O1. 1,3,5-Trinitrobenzene
H. 2,2'-Oxybis(1-chloropropane)	JJ. Dibenzofuran	LLL. Benzo(g,h,i)perylene	NNNN. 2,6-Dichlorophenol	P1. Pentachlorobenzene
I. 4-Methylphenol	KK. 2,4-Dinitrotoluene	MMM. Bis(2-Chloroisopropyl)ether	OOOO. 1,2-Diphenylhydrazine	Q1. 4-Aminobiphenyl
J. N-Nitroso-di-n-propylamine	LL. Diethylphthalate	NNN. Aniline	PPPP. 3-Methylphenol	R1. 2-Naphthylamine
K. Hexachloroethane	MM. 4-Chlorophenyl-phenyl ether	OOO. N-Nitrosodimethylamine	QQQQ. 3&4-Methylphenol	S1. Triphenylene
L. Nitrobenzene	NN. Fluorene	PPP. Benzoic Acid	RRRR. 4-Dimethyldibenzothiophene (4MDT)	T1. Octachlorostyrene
M. Isophorone	OO. 4-Nitroaniline	QQQ. Benzyl alcohol	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	U1. Famphur
N. 2-Nitrophenol	PP. 4,6-Dinitro-2-methylphenol	RRR. Pyridine	TTTT. 1-Methyldibenzothiophene (1MDT)	V1. 1,4-phenylenediamine
O. 2,4-Dimethylphenol	QQ. N-Nitrosodiphenylamine	SSS. Benzidine	UUUU.. 2,3,4,6-Tetrachlorophenol	W1. Methapyrilene
P. Bis(2-chloroethoxy)methane	RR. 4-Bromophenyl-phenylether	TTT. 1-Methylnaphthalene	VVVV. 1,2,4,5-Tetrachlorobenzene	X1. Pentachloroethane
Q. 2,4-Dichlorophenol	SS. Hexachlorobenzene	UUU.Benzo(b)thiophene	WWWW.. 2-Picoline	Y1. 3,3'-Dimethylbenzidine
R. 1,2,4-Trichlorobenzene	TT. Pentachlorophenol	VVV.Benzonaphthothiophene	XXXX. 3-Methylcholanthrene	Z1. o-Toluidine
S. Naphthalene	UU. Phenanthrene	WWW.Benzo(e)pyrene	YYYY. a,a-Dimethylphenethylamine	A2. 1-Naphthylamine
T. 4-Chloroaniline	VV. Anthracene	XXX. 2,6-Dimethylnaphthalene	ZZZZ. Hexachloropropene	B2. 4-Aminobiphenyl
U. Hexachlorobutadiene	WW. Carbazole	YYY. 2,3,5-Trimethylnaphthalene	A1. N-Nitrosodiethylamine	C2. 4-Nitroquinoline-1-oxide
V. 4-Chloro-3-methylphenol	XX. Di-n-butylphthalate	ZZZ. Perylene	B1. N-Nitrosodi-n-butylamine	D2. Hexachloropene
W. 2-Methylnaphthalene	YY. Fluoranthene	AAAA. Dibenzothiophene	C1. N-Nitrosomethylethylamine	E2. Bis (2-chloro-1-methylethyl) ether
X. Hexachlorocyclopentadiene	ZZ. Pyrene	BBBB. Benzo(a)fluoranthene	D1. N-Nitrosomorpholine	F2. Bifenthrin
Y. 2,4,6-Trichlorophenol	AAA. Butylbenzylphthalate	CCCC. Benzo(b)fluorene	E1. N-Nitrosopyrrolidine	G2. Cyfluthrin
Z. 2,4,5-Trichlorophenol	BBB. 3,3'-Dichlorobenzidine	DDDD. cis/trans-Decalin	F1. Phenacetin	H2. Cypermethrin
AA. 2-Chloronaphthalene	CCC. Benzo(a)anthracene	EEEE. 1,1'-Biphenyl	G1. 2-Acetylaminofluorene	I2. Permethrin (cis/trans)
BB. 2-Nitroaniline	DDD. Chrysene	FFFF. Retene	H1. Pronamide	J2. 5-Nitro-o-toluidine

J3. Benzo(j)fluoranthene

LDC #: 57680B2b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270E)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument?

Y (N) N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?

Y (N) N/A Were all %D and RRFs within the validation criteria of ≤20%D and ≥0.05 RRF ?

(5)

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	9/18/23 1049	SLI0244 ICV1	GGG	24.0		BLH0293-MB	J dw /A

LDC #: 57680B3b

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 8/14/23 **Blank analysis date:** 9/18/23

Conc. units: ug/kg Associated Samples: All using pof (7) judgment if not used for eval

Compound	Blank ID	5x	Sample Identification						
	BLH0293-MB		~~1 (10x)~~	~~2 (10x)~~	~~3 (10x)~~	~~4 (10x)~~	~~5 (10x)~~	~~7 (10x)~~	~~8 (10x)~~
GG	0.11	0.55							
JJ	0.16	0.8							
NN	0.38	1.9							
UU	2.62	13.1		108U				109U	121U
VV	0.96	4.8		37.5U				40.9U	43.3U
YY	3.52	17.6		~~207U~~ FT					
ZZ	2.47	12.35							
CCC	1.23	6.15		54.6U	44.8U	55.2U		46.8U	42.0U
DDD	1.21	6.05			53.1U	59.0U		55.4U	56.0U
GGG	0.91	4.55			39.5U	44.0U		42.4U	40.0U
HHH	0.69	3.45	29.9U	32.3U	20.7U	22.7U	32.5U	21.6U	20.6U
JJJ	0.68	3.4	31.7U	30.2U	22.1U	24.2U	33.2U	21.3U	20.8U
III	0.70	3.5	-		30.9U			27.5U	25.9U
JJJ	0.31	1.55	-		~~14.2U~~			12.4U	~~13.7U~~
~~KKK~~ LLL	0.41	2.05	-					-	-
~~LLL~~									

LDC #:_____

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

(T)

Blank extraction date: 8/14/23 **Blank analysis date:** 9/18/23
Conc. units: ug/kg Associated Samples: All

Compound	Blank ID	5X	Sample Identification						
	BLH293	-MB	9 (10X)	10 (10X)	11 (20X)	12 (10X)	13 (10X)		
GG	0.11	0.55							
JJ	0.16	0.8							
NN	0.38	1.9							
UU	2.62	13.1							
VV	0.96	4.8			69.2U				
YY	3.52	17.6							
ZZ	2.47	12.35							
CCC	1.23	6.15		46.2U	87.8U	58.2U	47.7U		
DDD	1.21	6.05		60.4U	111U		57.3U		
GGG	0.91	4.55		43.2U	67.4U		40.9U		
HHH	0.69	3.45	29.9U	22.5U	36.6U	25.4U	21.7U		
J3	0.68	3.4	29.8U	23.3U	36.9U	27.5U	23.2U		
III	0.70	3.5		32.8U	48.1U		34.4U		
JJJ	0.31	1.55			21.5U		15.5U		
LLL	0.41	2.05					-		

LDC #: 57680B26

VALIDATION FINDINGS WORKSHEET

Surrogate Recovery

Page: 1 of 1

Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270 E) SIM

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y [✓ N] N/A Were percent recoveries (%R) for surrogates within QC limits?

Y N [✓ N/A] If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?

Y N [✓ N/A] If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

(13)

#	Sample ID	Surrogate	%R (Limits)	Qualifications
	1→4, 6→13	surrogates outside limit	( )	NQ, ≥ 5x DL
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
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			( )	
			( )	
			( )	
			( )	

(NBZ) = Nitrobenzene - d5
(FBP) = 2-Fluorobiphenyl
(TPH) = Terphenyl - d14

(2FP) = 2-Fluorophenol
(TBP) = 2,4,6 -Tribromophenol
(2CP) = 2-Chlorophenol - d4

LDC #: 57680B2b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

METHOD: GC/MS SVOA (EPA SW 846 Method 8270 E) SIM

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y (N) N/A Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?

Level IV/D Only

Y N (N/A) Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed? (10)

LCS/LCSD ID	Compound	LCS % Recovery	LCSD % Recovery	LCS/LCSD %Recovery limits	RPD (Limits)	Associated Samples	Qualifications
BLH0293-LCSID	all	following pages			( )	All	
					( )		
					( )		
					All %)	R = J/UJ/P	all ND: J/R
					( )		
					All %)	RPD = J/UJ/P	all ND: J/R
					( )		
					( )		
					( )		
					( )		
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Analytical Resources, LLC
Analytical Chemists and Consultants

LCS / LCS DUPLICATE RECOVERY
EPA 8270E-SIM

Laboratory:	Analytical Resources, LLC	SDG:	23H0037
Client:	Anchor QEA, LLC	Project:	Jeld-Wen Step 1
Matrix:	Solid	Analyzed:	09/18/23 12:24
Batch:	BLH0293	Laboratory ID:	BLH0293-BS1
Preparation:	EPA 3546 (Microwave) Low Level	Sequence Name:	LCS
Initial/Final:	10 g / 0.5 mL		

COMPOUND	SPIKE ADDED (ug/kg wet)	LCS CONCENTRATION (ug/kg wet)	Q	LCS % REC. #	QC LIMITS REC.
Naphthalene S	15.000	6.71		44.7 ✓	~~30 - 160~~ 30-150
2-Methylnaphthalene W	15.000	6.61		44.1 ✓	30 - 160
1-Methylnaphthalene TTT	15.000	7.33		48.8 ✓	30 - 160
Acenaphthylene DD	15.000	6.70		44.6 ✓	30 - 160
Acenaphthene GG	15.000	6.28		41.9 ✓	30 - 160
Dibenzofuran JJ	15.000	6.84		45.6 ✓	30 - 160
Fluorene NN	15.000	7.64		51.0	30 - 160
Phenanthrene UU	15.000	7.55	B	50.3	30 - 160
Anthracene VV	15.000	6.98	B	46.5 ✓	30 - 160
Fluoranthene YY	15.000	8.25	B	55.0	30 - 160
Pyrene ZZ	15.000	8.49	B	56.6	30 - 160
Benzo(a)anthracene CCC	15.000	8.57	B	57.2	30 - 160
Chrysene DDD	15.000	8.35	B	55.7	30 - 160
Benzo(b)fluoranthene GGG	15.000	9.30	B	62.0	30 - 160
Benzo(k)fluoranthene HHH	15.000	8.52	B	56.8	30 - 160
Benzo(j)fluoranthene J3	15.000	8.85	B	59.0	30 - 160
Benzo(a)pyrene II	15.000	6.37	B	42.4 ✓	30 - 160
Indeno(1,2,3-cd)pyrene JJJ	15.000	5.55		37.0 ✓	30 - 160
Dibenzo(a,h)anthracene KKK	15.000	5.22		34.8 ✓	30 - 160
Benzo(g,h,i)perylene LLL	15.000	5.92		39.5 ✓	~~30 - 160~~

* Indicates values outside of QC limits

Analytical Resources, LLC
Analytical Chemists and Consultants

LCS / LCS DUPLICATE RECOVERY
EPA 8270E-SIM

Laboratory:	Analytical Resources, LLC	SDG:	23H0037
Client:	Anchor QEA, LLC	Project:	Jeld-Wen Step 1
Matrix:	Solid	Analyzed:	09/18/23 12:57
Batch:	BLH0293	Laboratory ID:	BLH0293-BSD1
Preparation:	EPA 3546 (Microwave) Low Level	Sequence Name:	LCS Dup
Initial/Final:	10 g / 0.5 mL		

COMPOUND	SPIKE ADDED (ug/kg wet)	LCSD CONCENTRATION (ug/kg wet)	Q	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Naphthalene S	15.000	12.3	*	81.9	58.7 *	~~30~~ 35	~~30 - 160~~ 50-150
2-Methylnaphthalene W	15.000	12.6	*	83.9	62.2 *	30	30 - 160
1-Methylnaphthalene TPT	15.000	13.3	*	88.9	58.2 *	30	30 - 160
Acenaphthylene OO	15.000	12.6	*	83.8	60.9 *	30	30 - 160
Acenaphthene GG	15.000	12.4	*	82.6	65.4 *	30	30 - 160
Dibenzofuran JJ	15.000	12.3	*	82.1	57.1 *	30	30 - 160
Fluorene NN	15.000	14.0	*	93.2	58.6 *	30	30 - 160
Phenanthrene UU	15.000	13.3	*, B	88.5	55.0 *	30	30 - 160
Anthracene VV	15.000	12.2	*, B	81.0	54.1 *	30	30 - 160
Fluoranthene YY	15.000	13.3	*, B	89.0	47.2 *	30	30 - 160
Pyrene ZZ	15.000	14.0	*, B	93.2	48.9 *	30	30 - 160
Benzo(a)anthracene CCC	15.000	14.4	*, B	95.7	50.5 *	30	30 - 160
Chrysene DDD	15.000	14.1	*, B	94.1	51.4 *	30	30 - 160
Benzo(b)fluoranthene GGG	15.000	14.9	*, B	99.2	46.1 *	30	30 - 160
Benzo(k)fluoranthene HHH	15.000	15.5	*, B	104	58.3 *	30	30 - 160
Benzo(j)fluoranthene JJ	15.000	14.1	*, B	93.7	45.4 *	30	30 - 160
Benzo(a)pyrene III	15.000	10.8	*, B	72.3	52.0 *	30	30 - 160
Indeno(1,2,3-cd)pyrene JJJ	15.000	9.32	*	62.2	50.7 *	30	30 - 160
Dibenzo(a,h)anthracene KKK	15.000	9.06	*	60.4	53.8 *	30	30 - 160
Benzo(g,h,i)perylene LLL	15.000	9.73	*	64.9	48.6 *	30	~~30 - 160~~

* Indicates values outside of QC limits

LDC #: 57680B2b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: FT

METHOD: GCMS VOA (EPA SW 846 Method 8270E SIM

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?

[✓ Y] N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

%R = (8)
%RPD = (9)

#	MS/MSD ID	Compound	MS %Recovery	MSD %Recovery	MS/MSD %Recovery Limits	RPD (Limits)	Associated Samples	Qualifications
	14 & 15	several	% R +	% RPD outside	limit	( )	2	NQ, ≥5X DL
						( )		
						( )		
						( )		
						( )		
						( )		
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						( )		

LDC#:__57680B2b

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:__FT__

METHOD: (EPA Method 8270E SIM))

Compound	Concentration (ug/kg		RPD
	7	8	
S	91.6	101	10
W	25.1	26.2	4
TTT	14.8	15.1	2
DD	14.2	15.2	7
GG	17.2	16.2	6
JJ	23.6	25.5	8
NN	24.9	24.5	2
UU	109	121	10
VV	40.9	43.3	6
YY	199	203	2
ZZ	174	179	3
CCC	46.8	42.0	11
DDD	55.4	56.0	1
GGG	42.4	40.0	6
HHH	21.6	20.6	5
J3	21.3	20.8	2
III	27.5	25.9	6
JJJ	12.4	12.7	2
KKK	3.06	2.56	18
LLL	22.7	24.2	6

LDC Report# 57680B3b

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: November 14, 2023

Parameters: Polychlorinated Biphenyls

Validation Level: Stage 2B & 4

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0037

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-PDI-118-SG-0-1-20230801	23H0037-04	Soil	08/01/23
JW-PDI-073-SG-0-1-20230801**	23H0037-08**	Soil	08/01/23
JW-PDI-056-SG-0-1-20230801	23H0037-09	Soil	08/01/23
JW-PDI-040-SG-0-1-20230801	23H0037-10	Soil	08/01/23
JW-PDI-054-SG-0-1-20230801	23H0037-16	Soil	08/01/23
JW-PDI-037-SG-0-1-20230801	23H0037-19	Soil	08/01/23
JW-PDI-059-SG-0-1-20230801**	23H0037-21**	Soil	08/01/23
JW-PDI-038-SG-0-1-20230801	23H0037-22	Soil	08/01/23
JW-PDI-039-SG-0-1-20230801	23H0037-23	Soil	08/01/23
JW-PDI-058-SG-0-1-20230801	23H0037-24	Soil	08/01/23
JW-PDI-054-SG-0-1-20230801MS	23H0037-16MS	Soil	08/01/23
JW-PDI-054-SG-0-1-20230801MSD	23H0037-16MSD	Soil	08/01/23

**Indicates sample underwent Stage 4 validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Stage 4 data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

NJ (Presumptive and estimated): The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all analytes.

Retention time windows were established as required by the method for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all analytes.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all analytes.

Retention times of all analytes in the calibration standards were within the established retention time windows for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Surrogates/Internal Standards

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Column	Surrogate	%R (Limits)	Affected Analyte	Flag	A or P
JW-PDI-118-SG-0-1-20230801	Col. 1	Tetrachloro-m-xylene	51.1 (53-120)	All analytes	J (all detects) UJ (all non-detects)	P

Sample	Column	Surrogate	%R (Limits)	Affected Analyte	Flag	A or P
JW-PDI-056-SG-0-1-20230801	Col. 1 Col. 2	Tetrachloro-m-xylene Tetrachloro-m-xylene	45.9 (53-120) 47.1 (53-120)	All analytes	J (all detects) UJ (all non-detects)	P
JW-PDI-040-SG-0-1-20230801	Col. 1 Col. 2	Tetrachloro-m-xylene Tetrachloro-m-xylene	38.3 (53-120) 37.1 (53-120)	All analytes	J (all detects) UJ (all non-detects)	P
JW-PDI-054-SG-0-1-20230801	Col. 1 Col. 2	Tetrachloro-m-xylene Tetrachloro-m-xylene	41.5 (53-120) 42.8 (53-120)	All analytes	J (all detects) UJ (all non-detects)	P
JW-PDI-037-SG-0-1-20230801	Col. 1 Col. 2	Tetrachloro-m-xylene Tetrachloro-m-xylene	47.5 (53-120) 48.1 (53-120)	All analytes	J (all detects) UJ (all non-detects)	P
JW-PDI-059-SG-0-1-20230801**	Col. 1 Col. 2	Decachlorobiphenyl Tetrachloro-m-xylene Tetrachloro-m-xylene	39.9 (40-133) 37.6 (53-120) 37.0 (53-120)	All analytes	J (all detects) UJ (all non-detects)	P
JW-PDI-038-SG-0-1-20230801	Col. 1 Col. 2	Tetrachloro-m-xylene Tetrachloro-m-xylene	37.8 (53-120) 39.2 (53-120)	All analytes	J (all detects) UJ (all non-detects)	P
JW-PDI-039-SG-0-1-20230801	Col. 1 Col. 2	Tetrachloro-m-xylene Tetrachloro-m-xylene	39.0 (53-120) 39.2 (53-120)	All analytes	J (all detects) UJ (all non-detects)	P
JW-PDI-058-SG-0-1-20230801	Col. 1 Col. 2	Tetrachloro-m-xylene Tetrachloro-m-xylene	37.4 (53-120) 37.9 (53-120)	All analytes	J (all detects) UJ (all non-detects)	P

All internal standard areas and retention times were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Target Analyte Quantitation

All target analyte quantitations met validation criteria for samples which underwent Stage 4 validation.

The sample results for detected analytes from the two columns were within 40% relative percent difference (RPD) with the following exceptions:

Sample	Analyte	RPD	Flag	A or P
JW-PDI-118-SG-0-1-20230801	Aroclor-1254	96	J (all detects)	A
JW-PDI-073-SG-0-1-20230801**	Aroclor-1248 Aroclor-1254 Aroclor-1260	48.1 55.2 86.8	J (all detects) J (all detects) J (all detects)	A
JW-PDI-059-SG-0-1-20230801**	Aroclor-1254	82.1	J (all detects)	A
JW-PDI-059-SG-0-1-20230801**	Aroclor-1260	200	NJ (all detects)	A
JW-PDI-038-SG-0-1-20230801	Aroclor-1254	83.8	J (all detects)	A
JW-PDI-056-SG-0-1-20230801	Aroclor-1248 Aroclor-1254	51.2 41.2	J (all detects) J (all detects)	A
JW-PDI-040-SG-0-1-20230801	Aroclor-1248 Aroclor-1260	88.1 47.7	J (all detects) J (all detects)	A
JW-PDI-037-SG-0-1-20230801	Aroclor-1260	51.7	J (all detects)	A
JW-PDI-058-SG-0-1-20230801	Aroclor-1248	41.8	J (all detects)	A

Raw data were not reviewed for Stage 2B validation.

XI. Target Analyte Identification

All target analyte identifications met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Data qualified due to surrogate %R and RPD between two columns are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polychlorinated Biphenyls - Data Qualification Summary - SDG 23H0037

Sample	Analyte	Flag	A or P	Reason (Code)
JW-PDI-118-SG-0-1-20230801 JW-PDI-056-SG-0-1-20230801 JW-PDI-040-SG-0-1-20230801 JW-PDI-054-SG-0-1-20230801 JW-PDI-037-SG-0-1-20230801 JW-PDI-059-SG-0-1-20230801** JW-PDI-038-SG-0-1-20230801 JW-PDI-039-SG-0-1-20230801 JW-PDI-058-SG-0-1-20230801	All analytes	J (all detects) UJ (all non-detects)	P	Surrogates (%R) (13)
JW-PDI-118-SG-0-1-20230801 JW-PDI-059-SG-0-1-20230801** JW-PDI-038-SG-0-1-20230801	Aroclor-1254	J (all detects)	A	Target analyte quantitation (RPD between two columns) (12)
JW-PDI-073-SG-0-1-20230801**	Aroclor-1248 Aroclor-1254 Aroclor-1260	J (all detects) J (all detects) J (all detects)	A	Target analyte quantitation (RPD between two columns) (12)
JW-PDI-059-SG-0-1-20230801**	Aroclor-1260	NJ (all detects)	A	Target analyte quantitation (RPD between two columns) (12)
JW-PDI-056-SG-0-1-20230801	Aroclor-1248 Aroclor-1254	J (all detects) J (all detects)	A	Target analyte quantitation (RPD between two columns) (12)
JW-PDI-040-SG-0-1-20230801	Aroclor-1248 Aroclor-1260	J (all detects) J (all detects)	A	Target analyte quantitation (RPD between two columns) (12)
JW-PDI-037-SG-0-1-20230801	Aroclor-1260	J (all detects)	A	Target analyte quantitation (RPD between two columns) (12)
JW-PDI-058-SG-0-1-20230801	Aroclor-1248	J (all detects)	A	Target analyte quantitation (RPD between two columns) (12)

Jeld-Wen
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG 23H0037

No Sample Data Qualified in this SDG

LDC #: 57680B3b
SDG #: 23H0037
Laboratory: Analytical Resources, Inc., Tukwila, WA

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/4

Date: 11/10/23
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC Polychlorinated Biphenyls (EPA SW-846 Method 8082A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	Initial calibration/ICV	A/A	%D/ICV ≤ 20
III.	Continuing calibration	A	CCV ≤ 20
IV.	Laboratory Blanks	A	
V.	Field blanks	N	
VI.	Surrogate spikes /14	SW	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	N	
X.	Target analyte quantitation	SW	Not reviewed for Stage 2B validation.
XI.	Target analyte identification	A	Not reviewed for Stage 2B validation.
XII	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Indicates sample underwent Stage 4 validation

	Client ID	Lab ID	Matrix	Date
1	JW-PDI-118-SG-0-1-20230801	23H0037-04	Soil	08/01/23
2	JW-PDI-073-SG-0-1-20230801**	23H0037-08**	Soil	08/01/23
3	JW-PDI-056-SG-0-1-20230801	23H0037-09	Soil	08/01/23
4	JW-PDI-040-SG-0-1-20230801	23H0037-10	Soil	08/01/23
5	JW-PDI-054-SG-0-1-20230801	23H0037-16	Soil	08/01/23
6	JW-PDI-037-SG-0-1-20230801	23H0037-19	Soil	08/01/23
7	JW-PDI-059-SG-0-1-20230801**	23H0037-21**	Soil	08/01/23
8	JW-PDI-038-SG-0-1-20230801	23H0037-22	Soil	08/01/23
9	JW-PDI-039-SG-0-1-20230801	23H0037-23	Soil	08/01/23
10	JW-PDI-058-SG-0-1-20230801	23H0037-24	Soil	08/01/23
11	JW-PDI-054-SG-0-1-20230801MS	23H0037-16MS	Soil	08/01/23
12	JW-PDI-054-SG-0-1-20230801MSD	23H0037-16MSD	Soil	08/01/23
13				

Notes:

	BLH0294						

LDC #: 57168036

VALIDATION FINDINGS CHECKLIST

Method: ✓ GC ___ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
IIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥0.990?			✓	
Were the RT windows properly established?	✓			
IIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20%?	✓			
Were all the retention times within the acceptance windows?	✓			
IV. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks?		✓		
V. Field Blanks				
Were field blanks identified in this SDG?		✓		
Were target compounds detected in the field blanks?			✓	
VI. Surrogate spikes				
Were all surrogate percent recovery (%R) within the QC limits?		✓		
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?		✓		
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
VIII. Laboratory control samples				
Was an LCS analyzed per analytical or extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				

Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
X. Compound quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG. Chlordane
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH. Chlordane (Technical)
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II. Aroclor 1262
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ. Aroclor 1268
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. 2,4'-DDD	KK. Oxychlordane
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. 2,4'-DDE	LL. trans-Nonachlor
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE. 2,4'-DDT	MM. cis-Nonachlor
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF. Hexachlorobenzene	NN.

Notes:_____

LDC #: 57680B3b

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: FT

METHOD: ✓ GC ___ HPLC

Are surrogates required by the method? Yes___ or No___.

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were surrogates spiked into all samples and blanks?

Y (N) N/A Did all surrogate recoveries (%R) meet the QC limits?

(13)

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	1	col 1	Y	51.1 (53 - 120)	J|UJ|P ND + Det
	3	col 1	Y	45.9 (↓)	J|UJ|P. ND + Det
		col 2	Y	47.1 (↓)	↓
	4	↓	↓	38.3 (↓)	J|UJ|P ND + DeT
				37.1 (↓)	↓
	5	↓	↓	41.5 (↓)	J|UJ|P ND + DeT
				42.8 (↓)	↓
	6	↓	↓	47.5 (↓)	J|UJ|P ND + DeT
				48.1 (↓)	↓
	7	col 1	Θ	39.9 (40-133)	J|UJ|P ND + DeT
		col 1	Y	37.6 (53-120)	↓
		col 2	Y	37.0 (53-120)	↓
	8	col 1	Y	37.8 (↓)	J|UJ|P ND + DeT
		col 2	Y	39.2 (↓)	↓

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	Chloro-octadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-Dichlorophenylacetic acid
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate	CC	2,5-Dibromotoluene
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 57680B36

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: FT

METHOD: ✓ GC __ HPLC

Are surrogates required by the method? Yes____ or No____.

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were surrogates spiked into all samples and blanks?

Y N N/A Did all surrogate recoveries (%R) meet the QC limits?

(13)

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	9	col 1	Y	39.0 (53 - 120)	J|UJ|P ND + Det
		col 2	Y	39.2 (↓)	↓
				( )	
	ID	↓	↓	37.4 (↓)	↓ ND + Det
				37.9 (↓)	
				( )	
	BLH0294-MB	↓	↓	49.1 (↓)	J|UJ|P
				47.1 (↓)	↓
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	Chloro-octadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-Dichlorophenylacetic acid
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate	CC	2,5-Dibromotoluene
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 57680B3b

VALIDATION FINDINGS WORKSHEET
Target Analyte Quantitation

Reviewer: FT

METHOD: __GC__ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results? (12)

#	Associated Samples	Compound Name	%RPD Bet 2 col ≤ 40 Findings	Qualifications
	1	AA	96	J det /A
	2	Z	48.1	J det /A
		AA	55.2	
		BB	86.8	↓
	7	AA	82.1	J det /A
		BB	200	NJ
	8	AA	83.8	J det /A
	3	Z	51.2	J det /A
		AA	41.2	↓
	4	Z	88.1	J det /A
		BB	47.7	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 57680B3b

VALIDATION FINDINGS WORKSHEET
Target Analyte Quantitation

METHOD: ✓ **GC** __ **HPLC**

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

(12)

#	Associated Samples	Compound Name	%/ RPD Bet 2 col Findings	Qualifications
19	6	BB	51.7	J det /A
24	10	Z	41.8	J det /A
		~~BB~~	200	

Comments: See sample calculation verification worksheet for recalculations

LDC #: 57680B3b

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT

METHOD: GC ✓ HPLC _____

The calibration factors (CF) and relative standard deviation (%RSD) were recalculated using the following calculations:

CF = A/C
Average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

Where: A = Area of compound
C = Concentration of compound
S = Standard deviation of calibration factors
X = Mean of calibration factors

#	Standard ID	Calibration Date	Compound	Reported CF (100 std)	Recalculated CF (10 std)	Reported CF (initial)	Recalculated CF (intial)	Reported %RSD	Recalculated %RSD
1	ICAL	8/19/23	Aroclor 1260-1 (ZB5)	4.30863×10^{-2}	4.31×10^{-2}	4.192872×10^{-2}	4.193×10^{-2}	5.9	5.9
2			Aroclo 1260-1 (ZB35)	4.688999×10^{-2}	4.689×10^{-2}	4.473978×10^{-2}	4.474×10^{-2}	7.8	7.8
3									
4									

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 57680B3b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT

METHOD: GC ✓ HPLC _____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF -CF)/ave.CF

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(ICAL)/ CCV Conc.	Reported CF/ Conc. CCV	Recalculated CF/ Conc. CCV	Reported %D	Recalculated %D
1	CCV2	9/6/23 1351	1260-1 ZB5	250.0	242	242	3.2	3.2
			1260-1 ZB35	↓	259	259	3.6	3.6
2								
3								
4								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 57628036

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: FT

METHOD: ✓ GC __ HPLC

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 7

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
DCB	col 1	40	15.9	39.9	39.9	0
TCMX	1		15.0	37.6	37.6	
↓	col 2	↓	17.6	43.9	43.9	↓
	2		14.8	37.0	37.0	

Sample ID: _____

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C`	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	Chloro-octadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-Dichlorophenylacetic acid
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate	CC	2,5-Dibromotoluene
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 57680 B3b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FT

METHOD: ✓ GC __ HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA

RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100

Where

SSC = Spiked sample concentration
SC = Sample concentration
SA = Spike added

MS = Matrix spike
MSD = Matrix spike duplicate

MS/MSD samples: 11 & 12

Compound	Spike Added (ug/kg)		Sample Conc. (ug/kg)	Spike Sample Concentration (ug/kg)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	---	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Aroclor 1260	500.13	500.13	ND	254	266	50.9	50.9	53.2	53.2	4.45	4.45

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 57680B3b

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: FT

METHOD: ✓ GC ___HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC/SA)
RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100

Where SSC = Spiked sample concentration
LCS = Laboratory Control Sample

SA = Spike added
LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples: BLH0294 LCS ID

Compound	Spike Added (ug/kg)		Spike Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Aroclor 1260	500	500	331	362	66.3	66.3	72.3	72.3	8.78	8.78

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 57680B3b

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: FT

METHOD: ✓ GC __ HPLC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration= $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. #2 Compound Name Aroclor 1260

Concentration = $\frac{(29.435)(5)}{(8.19)(0.6102)}$ =

= 29.4 ug/kg

#	Sample ID	Compound	Reported Concentrations (ug/kg)	Recalculated Results Concentrations (ug/kg)	Qualifications
	#2 (col2)	Aroclor 1260	29.4	29.4	
	1260-1 = (7197)(80) / 474094 (4.473978 x10^{-2})		=	1260-1 =	27.4
				2 =	13.2
				3 =	63.5
	= 27.14			4 =	13.9
					29.435

Comments: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: November 2, 2023

Parameters: Wet Chemistry

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA/
Materials Testing & Consulting, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0037/23B014-15

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-PDI-118-SG-0-1-20230801	23H0037-04	Soil	08/01/23
JW-PDI-117-SG-0-1-20230801	23H0037-06	Soil	08/01/23
JW-PDI-073-SG-0-1-20230801	23H0037-08	Soil	08/01/23
JW-PDI-056-SG-0-1-20230801	23H0037-09	Soil	08/01/23
JW-PDI-040-SG-0-1-20230801	23H0037-10	Soil	08/01/23
JW-PDI-072-SG-0-1-20230801	23H0037-11	Soil	08/01/23
JW-PDI-071-SG-0-1-20230801	23H0037-12	Soil	08/01/23
JW-PDI-1071-SG-0-1-20230801	23H0037-13	Soil	08/01/23
JW-PDI-054-SG-0-1-20230801	23H0037-16	Soil	08/01/23
JW-PDI-065-SG-0-1-20230801	23H0037-17	Soil	08/01/23
JW-PDI-037-SG-0-1-20230801	23H0037-19	Soil	08/01/23
JW-PDI-064-SG-0-1-20230801	23H0037-20	Soil	08/01/23
JW-PDI-059-SG-0-1-20230801	23H0037-21	Soil	08/01/23
JW-PDI-038-SG-0-1-20230801	23H0037-22	Soil	08/01/23
JW-PDI-039-SG-0-1-20230801	23H0037-23	Soil	08/01/23
JW-PDI-058-SG-0-1-20230801	23H0037-24	Soil	08/01/23
JW-PDI-118-SG-0-1-20230801DUP	23H0037-04DUP	Soil	08/01/23
JW-PDI-118-SG-0-1-20230801TRP	23H0037-04TRP	Soil	08/01/23

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Moisture Content by American Society for Testing and Material (ASTM) C556 and ASTM D2216
Organic Matter by ASTM D2974
Total Solids by ASTM D2216

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

Initial calibration analysis was not required by the methods.

III. Continuing Calibration

Continuing calibration frequency and analysis was not required by the methods.

IV. Laboratory Blanks

Laboratory blank analysis was not required by the methods.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the methods.

VII. Triplicate Sample Analysis

Triplicate (TRP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were not required by the methods.

IX. Field Duplicates

Samples JW-PDI-071-SG-0-1-20230801 and JW-PDI-1071-SG-0-1-20230801 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (%)		RPD
	JW-PDI-071-SG-0-1-20230801	JW-PDI-1071-SG-0-1-20230801	
Moisture content	81.9	75.7	8
Organic matter	5.29	5.01	5

X. Target Analyte Quantitation

Raw data were not reviewed for Stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Jeld-Wen
Wet Chemistry - Data Qualification Summary - SDG 23H0037/23B014-15

No Sample Data Qualified in this SDG

Jeld-Wen
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 23H0037/23B014-15

No Sample Data Qualified in this SDG

LDC #: 57680B6 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/1/23

SDG #: 23H0037/23B014-15 Stage 2B Page: 1 of 2

Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer: NF

Sub-Laboratory: Materials Testing & Consulting, Inc., Tukwila, WA 2nd Reviewer: AC

METHOD: (Analyte) Moisture Content (ASTM C556/ASTM D2216), Organic Matter (ASTM D2974), Total Solids (ASTM D2216)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II	Initial calibration	N	
III.	Calibration verification	N	
IV	Laboratory Blanks	N	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	N	
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	N	
IX.	Field duplicates	SW	FD=(7,8)
X.	Target Analyte Quantitation	N	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	JW-PDI-118-SG-0-1-20230801	23H0037-04	Soil	08/01/23
2	JW-PDI-117-SG-0-1-20230801	23H0037-06	Soil	08/01/23
3	JW-PDI-073-SG-0-1-20230801	23H0037-08	Soil	08/01/23
4	JW-PDI-056-SG-0-1-20230801	23H0037-09	Soil	08/01/23
5	JW-PDI-040-SG-0-1-20230801	23H0037-10	Soil	08/01/23
6	JW-PDI-072-SG-0-1-20230801	23H0037-11	Soil	08/01/23
7	JW-PDI-071-SG-0-1-20230801	23H0037-12	Soil	08/01/23
8	JW-PDI-1071-SG-0-1-20230801	23H0037-13	Soil	08/01/23
9	JW-PDI-054-SG-0-1-20230801	23H0037-16	Soil	08/01/23
10	JW-PDI-065-SG-0-1-20230801	23H0037-17	Soil	08/01/23
11	JW-PDI-037-SG-0-1-20230801	23H0037-19	Soil	08/01/23
12	JW-PDI-064-SG-0-1-20230801	23H0037-20	Soil	08/01/23
13	JW-PDI-059-SG-0-1-20230801	23H0037-21	Soil	08/01/23
14	JW-PDI-038-SG-0-1-20230801	23H0037-22	Soil	08/01/23
15	JW-PDI-039-SG-0-1-20230801	23H0037-23	Soil	08/01/23
16	JW-PDI-058-SG-0-1-20230801	23H0037-24	Soil	08/01/23

LDC #: 57680B6 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/1/23
SDG #: 23H0037/23B014-15 Stage 2B Page: 2 of 2
Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer: NF
Sub-Laboratory: Materials Testing & Consulting, Inc., Tukwila, WA 2nd Reviewer: M

METHOD: (Analyte) Moisture Content (ASTM C556/ASTM D2216), Organic Matter (ASTM D2974), Total Solids (ASTM D2216)

	Client ID	Lab ID	Matrix	Date
17	JW-PDI-118-SG-0-1-20230801DUP	23H0037-04DUP	Soil	08/01/23
18	JW-PDI-118-SG-0-1-20230801TRP	23H0037-04TRP	Soil	08/01/23
19				
20				
21				

Notes:

Sample Specific Element Reference

All elements are applicable to each sample as noted below.

Sample ID	Target Analyte List
1-16	Moisture Content, Organic Matter
1, 3-5, 9, 11, 13-16	Total Solids
QC	
17-18	Moisture Content, Organic Matter

Field Duplicates

METHOD: Inorganics

Analyte	Concentration (%)		RPD
	7	8	
Moisture Content	81.9	75.7	8
Organic Matter	5.29	5.01	5

LDC Report# 57680B21

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: November 14, 2023

Parameters: Polychlorinated Dioxins/Dibenzofurans

Validation Level: Stage 2B & 4

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0037

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-PDI-050-SG-0-1-20230801	23H0037-01	Soil	08/01/23
JW-PDI-049-SG-0-1-20230801**	23H0037-02**	Soil	08/01/23
JW-PDI-048-SG-0-1-20230801	23H0037-03	Soil	08/01/23
JW-PDI-118-SG-0-1-20230801	23H0037-04	Soil	08/01/23
JW-PDI-043-SG-0-1-20230801	23H0037-05	Soil	08/01/23
JW-PDI-046-SG-0-1-20230801	23H0037-07	Soil	08/01/23
JW-PDI-073-SG-0-1-20230801**	23H0037-08**	Soil	08/01/23
JW-PDI-056-SG-0-1-20230801	23H0037-09	Soil	08/01/23
JW-PDI-040-SG-0-1-20230801	23H0037-10	Soil	08/01/23
JW-PDI-036-SG-0-1-20230801	23H0037-14	Soil	08/01/23
JW-PDI-1036-SG-0-1-20230801	23H0037-15	Soil	08/01/23
JW-PDI-054-SG-0-1-20230801	23H0037-16	Soil	08/01/23
JW-PDI-041-SG-0-1-20230801	23H0037-18	Soil	08/01/23
JW-PDI-037-SG-0-1-20230801	23H0037-19	Soil	08/01/23
JW-PDI-059-SG-0-1-20230801**	23H0037-21**	Soil	08/01/23
JW-PDI-038-SG-0-1-20230801	23H0037-22	Soil	08/01/23
JW-PDI-039-SG-0-1-20230801	23H0037-23	Soil	08/01/23
JW-PDI-058-SG-0-1-20230801	23H0037-24	Soil	08/01/23
JW-PDI-049-SG-0-1-20230801DUP	23H0037-02DUP	Soil	08/01/23

**Indicates sample underwent Stage 4 validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for High Resolution Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Dioxins/Dibenzofurans by Environmental Protection Agency (EPA) Method 1613B

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Stage 4 data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25%.

The static resolving power was at least 10,000 (10% valley definition).

III. Initial Calibration and Initial Calibration Verification

A five point initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all analytes and less than or equal to 35.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The minimum S/N ratio was greater than or equal to 10 for each analyte and labeled compound associated to samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

The percent differences (%D) of the initial calibration verification (ICV) standard were within the QC limits for all analytes and labeled compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration results were within the QC limits for all analytes and labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The minimum S/N ratio was greater than or equal to 10 for each analyte and labeled compound associated to samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Analyte	Concentration (ng/Kg)	Associated Samples
BLH0233-MB	08/10/23	OCDD	0.845	All samples in SDG 23H0037

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates/Duplicate Sample Analysis

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples JW-PDI-036-SG-0-1-20230801 and JW-PDI-1036-SG-0-1-20230801 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/Kg)		RPD
	JW-PDI-036-SG-0-1-20230801	JW-PDI-1036-SG-0-1-20230801	
2,3,7,8-TCDF	7.74	9.13	16
2,3,7,8-TCDD	1.16	1.42	20
1,2,3,7,8-PeCDF	2.35	3.18	30
2,3,4,7,8-PeCDF	2.09	3.56	52
1,2,3,7,8-PeCDD	3.58	5.09	35
1,2,3,4,7,8-HxCDF	2.17	2.19	1
1,2,3,6,7,8-HxCDF	1.78	2.01	12
2,3,4,6,7,8-HxCDF	1.67	1.88	12
1,2,3,4,7,8-HxCDD	2.67	4.81	57

Analyte	Concentration (ng/Kg)		RPD
	JW-PDI-036-SG-0-1-20230801	JW-PDI-1036-SG-0-1-20230801	
1,2,3,6,7,8-HxCDD	8.72	10.7	20
1,2,3,7,8,9-HxCDD	5.80	8.04	32
1,2,3,4,6,7,8-HpCDF	29.1	30.5	5
1,2,3,4,7,8,9-HpCDF	2.03	1.99	2
1,2,3,4,6,7,8-HpCDD	131	142	8
OCDF	47.6	52.0	9
OCDD	787	895	13
Total TCDF	86.9	121	33
Total TCDD	85.1	289	109
Total PeCDF	34.2	40.1	16
Total PeCDD	56.1	181	105
Total HxCDF	40.4	44.6	10
Total HxCDD	113	210	60
Total HpCDF	80.0	85.6	7
Total HpCDD	288	299	4

X. Labeled Compounds

All percent recoveries (%R) for labeled compounds used to quantitate target analytes were within QC limits.

XI. Target Analyte Quantitation

All target analyte quantitations were within validation criteria with the following exceptions:

Sample	Analyte	Flag	A or P
JW-PDI-050-SG-0-1-20230801 JW-PDI-049-SG-0-1-20230801** JW-PDI-048-SG-0-1-20230801 JW-PDI-118-SG-0-1-20230801 JW-PDI-043-SG-0-1-20230801 JW-PDI-046-SG-0-1-20230801 JW-PDI-073-SG-0-1-20230801** JW-PDI-056-SG-0-1-20230801 JW-PDI-040-SG-0-1-20230801 JW-PDI-036-SG-0-1-20230801 JW-PDI-054-SG-0-1-20230801 JW-PDI-041-SG-0-1-20230801 JW-PDI-037-SG-0-1-20230801 JW-PDI-059-SG-0-1-20230801** JW-PDI-038-SG-0-1-20230801 JW-PDI-039-SG-0-1-20230801 JW-PDI-058-SG-0-1-20230801	All analytes reported by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A
JW-PDI-073-SG-0-1-20230801** JW-PDI-056-SG-0-1-20230801 JW-PDI-041-SG-0-1-20230801 JW-PDI-037-SG-0-1-20230801 JW-PDI-038-SG-0-1-20230801	All analytes flagged "X" by the laboratory as possible chlorodiphenyl ether (CDPE) interference.	J (all detects)	A

Raw data were not reviewed for Stage 2B validation.

XII. Target Analyte Identification

All target analyte identifications met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Data qualified due to results reported by the laboratory as EMPCs and CDPE interference are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Data Qualification Summary - SDG 23H0037

Sample	Analyte	Flag	A or P	Reason (Code)
JW-PDI-050-SG-0-1-20230801 JW-PDI-049-SG-0-1-20230801** JW-PDI-048-SG-0-1-20230801 JW-PDI-118-SG-0-1-20230801 JW-PDI-043-SG-0-1-20230801 JW-PDI-046-SG-0-1-20230801 JW-PDI-073-SG-0-1-20230801** JW-PDI-056-SG-0-1-20230801 JW-PDI-040-SG-0-1-20230801 JW-PDI-036-SG-0-1-20230801 JW-PDI-054-SG-0-1-20230801 JW-PDI-041-SG-0-1-20230801 JW-PDI-037-SG-0-1-20230801 JW-PDI-059-SG-0-1-20230801** JW-PDI-038-SG-0-1-20230801 JW-PDI-039-SG-0-1-20230801 JW-PDI-058-SG-0-1-20230801	All analytes reported by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A	Target analyte quantitation (EMPC) (23)
JW-PDI-073-SG-0-1-20230801** JW-PDI-056-SG-0-1-20230801 JW-PDI-041-SG-0-1-20230801 JW-PDI-037-SG-0-1-20230801 JW-PDI-038-SG-0-1-20230801	All analytes flagged "X" by the laboratory as possible chlorodiphenyl ether (CDPE) interference.	J (all detects)	A	Target analyte quantitation (CDPE interference) (24)

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG 23H0037

No Sample Data Qualified in this SDG

LDC #: 57680B21 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/10/23
SDG #: 23H0037 Stage 2B/4 Page: 1 of 2
Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer:
2nd Reviewer:

METHOD: HRGC/HRMS Polychlorinated Dioxins/Dibenzofurans (EPA Method 1613B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	%D RSD ≤ 20/35 ICV = QC limits
IV.	Continuing calibration	A	CCV = QC limits
V.	Laboratory Blanks	SW	
VI.	Field blanks	N	
VII.	Matrix spike/Matrix spike duplicates /Dup	N / A	MS
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	SW	D = 10, 11
X.	Labeled Compounds	A	
XI.	Target analyte quantitation	SW	Not reviewed for Stage 2B validation.
XII.	Target analyte identification	A	Not reviewed for Stage 2B validation.
XIII	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Stage 4 validation

	Client ID	Lab ID	Matrix	Date
1	JW-PDI-050-SG-0-1-20230801	23H0037-01	Soil	08/01/23
2	JW-PDI-049-SG-0-1-20230801**	23H0037-02**	Soil	08/01/23
3	JW-PDI-048-SG-0-1-20230801	23H0037-03	Soil	08/01/23
4	JW-PDI-118-SG-0-1-20230801	23H0037-04	Soil	08/01/23
5	JW-PDI-043-SG-0-1-20230801	23H0037-05	Soil	08/01/23
6	JW-PDI-046-SG-0-1-20230801	23H0037-07	Soil	08/01/23
7	JW-PDI-073-SG-0-1-20230801**	23H0037-08**	Soil	08/01/23
8	JW-PDI-056-SG-0-1-20230801	23H0037-09	Soil	08/01/23
9	JW-PDI-040-SG-0-1-20230801	23H0037-10	Soil	08/01/23
10	JW-PDI-036-SG-0-1-20230801 D	23H0037-14	Soil	08/01/23
11	JW-PDI-1036-SG-0-1-20230801 D	23H0037-15	Soil	08/01/23
12	JW-PDI-054-SG-0-1-20230801	23H0037-16	Soil	08/01/23
13	JW-PDI-041-SG-0-1-20230801	23H0037-18	Soil	08/01/23
14	JW-PDI-037-SG-0-1-20230801	23H0037-19	Soil	08/01/23
15	JW-PDI-059-SG-0-1-20230801**	23H0037-21**	Soil	08/01/23
16	JW-PDI-038-SG-0-1-20230801	23H0037-22	Soil	08/01/23

Lab Dup %RPD limit ≤ 35% B ≤ 3x RL Result

LDC #: 57680B21 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/10/23
SDG #: 23H0037 Stage 2B/4 Page: 2 of 2
Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer: PT
2nd Reviewer: AL

METHOD: HRGC/HRMS Polychlorinated Dioxins/Dibenzofurans (EPA Method 1613B)

	Client ID	Lab ID	Matrix	Date
17	JW-PDI-039-SG-0-1-20230801	23H0037-23	Soil	08/01/23
18	JW-PDI-058-SG-0-1-20230801	23H0037-24	Soil	08/01/23
19	JW-PDI-049-SG-0-1-20230801DUP	23H0037-02DUP	Soil	08/01/23
20				
21				
22				

Notes:

	BL-H0233-BLK1						

LDC #: 57640B21

VALIDATION FINDINGS CHECKLIST

Reviewer: FT

Method: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Was PFK exact mass 380.9760 verified?	✓			
Were the retention time windows established for all homologues?	✓			
Was the chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomers ≤ 25% ?	✓			
Is the static resolving power at least 10,000 (10% valley definition)?	✓			
Was the mass resolution adequately check with PFK?	✓			
Was the presence of 1,2,8,9-TCDD and 1,3,4,6,8-PeCDF verified?	✓			
IIIa. Initial calibration				
Was the initial calibration performed at 5 concentration levels?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20% for unlabeled compounds and ≤ 35% for unlabeled compounds?	✓			
Did all calibration standards meet the Ion Abundance Ratio criteria?	✓			
Was the signal to noise ratio for each target compound and labeled compound ≥ 10?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all concentrations for the unlabeled compounds and for labeled compounds within QC limits?	✓			
IV. Continuing calibration				
Was a continuing calibration performed at the beginning and end of each 12 hour period?	✓			
Were all concentrations for the unlabeled compounds and for labeled compounds within QC limits?	✓			
Did all continuing calibration standards meet the Ion Abundance Ratio criteria?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank performed for each matrix and whenever a sample extraction was performed?	✓			
Was there contamination in the method blanks?	✓			
VI. Field blanks				
Were field blanks identified in this SDG?		✓		
Were target compounds detected in the field blanks?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?			✓	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	

Validation Area	Yes	No	NA	Findings/Comments
VIII. Laboratory control samples				
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
X. Labeled Compounds				
Were labeled compounds within the 25-150% criteria?	✓			
Was the minimum S/N ratio of all labeled compound peaks ≥ 10?	✓			
XI. Compound quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XII. Target compound identification				
For 2,3,7,8 substituted congeners with associated labeled standards, were the retention times of the two quantitation peaks within -1 to 3 sec. of the RT of the labeled standard?	✓			
For 2,3,7,8 substituted congeners without associated labeled standards, were the relative retention times of the two quantitation peaks within 0.005 time units of the RRT measured in the routine calibration?	✓			
For non-2,3,7,8 substituted congeners, were the retention times of the two quantitation peaks within RT established in the performance check solution?	✓			
Did compound spectra contain all characteristic ions listed in the table attached?	✓			
Was the Ion Abundance Ratio for the two quantitation ions within criteria?	✓			
Was the signal to noise ratio for each target compound ≥2.5 and ≥10 for the labeled compound?	✓			
Does the maximum intensity of each specified characteristic ion coincide within ± 2 seconds (includes labeled standards)?	✓			
For PCDF identification, was any signal (S/N ≥ 2.5, at ± seconds RT) detected in the corresponding PCDPE channel?	✓			
Was an acceptable lock mass recorded and monitored?	✓			
XIII. System performance				
System performance was found to be acceptable.	✓			
XIV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

A. 2,3,7,8-TCDD	F. 1,2,3,4,6,7,8-HpCDD	K. 1,2,3,4,7,8-HxCDF	P. 1,2,3,4,7,8,9-HpCDF	U. Total HpCDD
B. 1,2,3,7,8-PeCDD	G. OCDD	L. 1,2,3,6,7,8-HxCDF	Q. OCDF	V. Total TCDF
C. 1,2,3,4,7,8-HxCDD	H. 2,3,7,8-TCDF	M. 2,3,4,6,7,8-HxCDF	R. Total TCDD	W. Total PeCDF
D. 1,2,3,6,7,8-HxCDD	I. 1,2,3,7,8-PeCDF	N. 1,2,3,7,8,9-HxCDF	S. Total PeCDD	X. Total HxCDF
E. 1,2,3,7,8,9-HxCDD	J. 2,3,4,7,8-PeCDF	O. 1,2,3,4,6,7,8-HpCDF	T. Total HxCDD	Y. Total HpCDF

Notes:_____

LDC #: 57680B21

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: FT

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a method blank?

Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?

Y N N/A Was the method blank contaminated?

Blank extraction date: 8/10/23 **Blank analysis date:** 9/7/23 **Associated samples:** All (75X)

Conc. units: ng/kg

Compound	Blank ID	Sample Identification								
	BLH0233-MB									
G	0.845	4.225								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 57680 B21

VALIDATION FINDINGS WORKSHEET
Target Analyte Quantitation and Reported CRQLs

Reviewer: FT

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the compound?
Y N N/A Compound quantitation and CRQLs were adjusted to reflect all sample dilutions and dry weight factors (if necessary). (23)

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		1→10, 12→18	all analytes qualified as EMPC by the lab		J det /A
		7, 8, 13, 14, 16	all analytes qualified X as possible CDPE interference		J det /Δ (24)

Comments: See sample calculation verification worksheet for recalculations Note: qualified "X" is for H

LDC#:__57680B21 **VALIDATION FINDINGS WORKSHEET** Page:_1__of_1__
Field Duplicates Reviewer:__FT____

METHOD: (EPA Method 1613B)

Compound	Concentration (ng/kg)		RPD
	10	11	
H	7.74	9.13	16
A	1.16	1.42	20
I	2.35	3.18	30
J	2.09	3.56	52
B	3.58	5.09	35
K	2.17	2.19	1
L	1.78	2.01	12
M	1.67	1.88	12
C	2.67	4.81	57
D	8.72	10.7	20
E	5.80	8.04	32
O	29.1	30.5	5
P	2.03	1.99	2
F	131	142	8
Q	47.6	52.0	9
G	787	895	13
V	86.9	121	33
R	85.1	289	109
W	34.2	40.1	16
S	56.1	181	105
X	40.4	44.6	10
T	113	210	60
Y	80.0	85.6	7
U	288	299	4

LDC #:_____

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page:___of___
Reviewer:_____

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs,

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard
X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported RRF (CS3 std) 10/50/100	Recalculated RRF (CS3 std)	Reported %RSD	Recalculated %RSD
1	ICAL	081123	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.9031472	0.9031472	0.8956648	0.8956648	1.2	1.2
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.242982	1.242982	1.171298	1.171298	3.8	3.8
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	0.8826935	0.8826935	0.9220737	0.9220737	4.4	4.4
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	1.199603	1.199603	1.184304	1.184304	12.2	12.2
			OCDF (^{13}C-OCDD)	1.130205	1.130205	1.104526	1.104526	12.7	12.7
2			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)						
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)						
			OCDF (^{13}C-OCDD)						
3			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)						
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)						
			OCDF (^{13}C-OCDD)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 57680 B21

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = $(A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	True amount	Reported Amount (CC)	Recalculated Amount (CC)	Reported	Recalculated
1	CCV	9/7/23 1121	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	10.0	10.4	10.4		
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	10.0	10.0	10.0		
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	50.0	49.6	49.6		
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	50.0	49.2	49.2		
			OCDF (^{13}C-OCDD)	100	115	115		
2			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)					
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)					
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)					
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)					
			OCDF (^{13}C-OCDD)					
3			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)					
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)					
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)					
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)					
			OCDF (^{13}C-OCDD)					

Comments: Refer to Routine Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 57680B21

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: FT

METHOD: GC/MS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration
SA = Spike added

RPD = I LCS - LCSD I * 2/(LCS + LCSD) LCS = Laboraotry control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS ID: BLH0233 - LCS

Compound	Spike Added (ng/kg)		Spiked Sample Concentration (ng/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalc
2,3,7,8-TCDD	20	NA	18.4	NA	92.2	92.2				
1,2,3,7,8-PeCDD	100		98.0		98.0	98.0				
1,2,3,4,7,8-HxCDD	100		90.8		90.8	90.8				
1,2,3,4,7,8,9-HpCDF	100		107		107	107				
OCDF	200		185		92.7	92.7	NA			

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 57680B2/

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

RRF = Relative Response Factor (average) from the initial calibration

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

Example:

Sample I.D. #2; OCDF:

Conc. $= \frac{\left(1.290\times10^{4} + 1.437\times10^{4}\right)(200)\quad(20)}{\left(2.561\times10^{5} + 2.872\times10^{5}\right)(1.130)\,(16.34)\,(0.6122)}$

$= 17.76$ ng/kg

#	Sample ID	Compound	Reported Concentration (ng/kg)	Calculated Concentration (ng/kg)	Qualification
	#2	OCDF	17.8	17.76	

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Anchor QEA, LLC
1201 Third Ave. Suite 2600
Seattle, WA 98101
ATTN: Ms. Delaney Peterson
dpeterson@anchorqea.com

December 15, 2023

SUBJECT: Jeld-Wen - Data Validation

Dear Ms. Peterson,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on October 24, 2023. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #57827:

SDG #	**Fraction**
23H0177	Polynuclear Aromatic Hydrocarbons, Polychlorinated Biphenyls, Wet Chemistry, Polychlorinated Dioxins/Dibenzofurans
23H0397	

The data validation was performed under Stage 2B & 4 guidelines. The analysis was validated using the following documents, as applicable to each method:

- Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023)
- USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020)
- USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (November 2020)
- USEPA National Functional Guidelines (NFG) for High Resolution Superfund Methods Data Review (November 2020)
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Stella Cuenco
scuenco@lab-data.com
Project Manager/Senior Chemist

Stage 2B (PCB & Diox 90/10) EDD

LDC# 57827 (Anchor Environmental-Seattle WA / Jeld-Wen)

LDC	SDG#	DATE REC'D	(3) DATE DUE	PAHs (8270E -SIM)		PCBs (8082A)		Dioxins (1613B)		Moist. Content (D2216)		Org. Matter (D2974)		Total Solids (D2216)																					
Matrix:	Water/Soil-Sediment			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	23H0177	10/24/23	11/14/23	1	7	1	5	1	16	0	12	0	12	0	9																				
A	23H0177	10/24/23	11/14/23	0	0	0	1	0	3	0	0	0	0	0	0																				
B	23H0397	10/24/23	11/14/23	0	7	0	4	0	8	0	9	0	9	0	5																				
Total	TR/SC			1	14	1	10	1	27	0	21	0	21	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	110

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS, MSD, or DUP's.

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: December 13, 2023

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0177

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-PDI-020-SG-0-1-20230803	23H0177-01	Soil	08/03/23
JW-PDI-019-SG-0-1-20230803	23H0177-03	Soil	08/03/23
JW-PDI-1019-SG-0-1-20230803	23H0177-05	Soil	08/03/23
JW-PDI-031-SG-0-1-20230803	23H0177-08	Soil	08/03/23
JW-PDI-018-SG-0-1-20230803	23H0177-09	Soil	08/03/23
JW-PDI-014-SG-0-1-20230803	23H0177-17	Soil	08/03/23
JW-RB-03-20230804	23H0177-21	Water	08/04/23
JW-PDI-025-SG-0-1-20230804	23H0177-22	Soil	08/04/23
JW-PDI-020-SG-0-1-20230803MS	23H0177-01MS	Soil	08/03/23
JW-PDI-020-SG-0-1-20230803MSD	23H0177-01MSD	Soil	08/03/23

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270E in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check was performed at the required frequency.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For analytes where average relative response factors (RRFs) were utilized, percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the analytes, all coefficients of determination (r^2) were greater than or equal to 0.990.

Average relative response factors (RRF) for all analytes were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all analytes.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all analytes with the following exceptions:

Date	Analyte	%D	Associated Samples	Flag	A or P
09/12/23	Acenaphthylene	22.0	JW-RB-03-20230804	NA	-
09/12/23	Benzo(k)fluoranthene	21.2	JW-RB-03-20230804	J (all detects)	A
09/14/23	Acenaphthylene Benzo(k)fluoranthene	26.4 21.2	JW-PDI-025-SG-0-1-20230804	J (all detects) J (all detects)	A
09/15/23	Acenaphthylene Benzo(b)fluoranthene	23.6 26.0	JW-PDI-020-SG-0-1-20230803 JW-PDI-1019-SG-0-1-20230803 JW-PDI-018-SG-0-1-20230803 JW-PDI-014-SG-0-1-20230803	J (all detects) J (all detects)	A

Date	Analyte	%D	Associated Samples	Flag	A or P
09/18/23	Benzo(b)fluoranthene	24.0	JW-PDI-019-SG-0-1-20230803 JW-PDI-031-SG-0-1-20230803	J (all detects)	A

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Analyte	Concentration (ug/Kg)	Associated Samples
BLH0362-BLK1	08/15/23	Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Chrysene Benzo(b)fluoranthene	0.08 0.32 0.10 0.27 0.23 0.12 0.07	All soil samples in SDG 23H0177

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks.

VI. Field Blanks

Sample JW-RB-03-20230804 was identified as a rinse blank. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration (ug/L)
JW-RB-03-20230804	Naphthalene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(j)fluoranthene Benzo(a)pyrene Perylene Indeno(1,2,3-cd)pyrene Benzo(g,h,i)perylene	0.006 0.074 0.020 0.088 0.160 0.030 0.039 0.025 0.017 0.017 0.027 0.008 0.018 0.100

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Surrogate	%R (30-160)	Affected Analyte	Flag	A or P
JW-PDI-019-SG-0-1-20230803	2-Methylnaphthalene-d10 Dibenzo(a,h)anthracene-d14	29.4 22.0	All analytes	J (all detects) UJ (all non-detects)	P

Surrogate recoveries (%R) were not within QC limits for samples JW-PDI-020-SG-0-1-20230803 and JW-PDI-025-SG-0-1-20230804. Using professional judgment, no data were qualified when one surrogate %R was outside the QC limits and the %R was greater than or equal to 10%.

Additionally, surrogate recoveries (%R) were not within QC limits for several samples. No data were qualified for samples analyzed at greater than or equal to 5X dilution.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were not within the QC limits for JW-PDI-020-SG-0-1-20230803MS/MSD. No data were qualified for MS/MSD samples analyzed greater than or equal to a 5X dilution. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Analyte	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
BLH0284-LCS/LCSD (All water samples in SDG 23H0177)	Pyrene	141 (60-140)	-	J (all detects)	P
BLH0284-LCS/LCSD (All water samples in SDG 23H0177)	Perylene	54.6 (60-140)	38.7 (60-140)	J (all detects)	P

LCS ID (Associated Samples)	Analyte	LCS %R (Limits)	LCSD %R (Limits)	Flag	A or P
BLH0362-LCS/LCSD (All soil samples in SDG 23H0177)	Naphthalene	-	43.0 (50-150)	J (all detects)	P
	2-Methylnaphthalene	-	43.4 (50-150)	J (all detects)	
	1-Methylnaphthalene	-	47.9 (50-150)	J (all detects)	
	Acenaphthylene	-	48.3 (50-150)	J (all detects)	
	Acenaphthene	-	44.4 (50-150)	J (all detects)	
	Dibenzofuran	-	45.0 (50-150)	J (all detects)	
	Phenanthrene	-	47.9 (50-150)	J (all detects)	
	Benzo(a)pyrene	-	45.3 (50-150)	J (all detects)	
	Indeno(1,2,3-cd)pyrene	-	45.3 (50-150)	J (all detects)	
	Dibenzo(a,h)anthracene	-	43.7 (50-150)	J (all detects)	
	Benzo(g,h,i)perylene	-	49.1 (50-150)	J (all detects)	

Relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Analyte	RPD (≤30)	Flag	A or P
BLH0284-LCS/LCSD (All water samples in SDG 23H0177)	Fluoranthene	31.5	J (all detects)	P
	Pyrene	45.2	J (all detects)	
	Perylene	34.1	J (all detects)	

X. Field Duplicates

Samples JW-PDI-019-SG-0-1-20230803 and JW-PDI-1019-SG-0-1-20230803 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/Kg)		RPD
	JW-PDI-019-SG-0-1-20230803	JW-PDI-1019-SG-0-1-20230803	
Naphthalene	26.5	17.9	39
2-Methylnaphthalene	9.21	5.21	55
1-Methylnaphthalene	5.88	3.21	59
Acenaphthylene	4.41	4.48	2
Acenaphthene	6.50	3.10	71
Dibenzofuran	6.93	4.48	43
Fluorene	9.05	5.47	49
Phenanthrene	32.7	23.9	31
Anthracene	12.6	9.34	30
Fluoranthene	53.1	49.6	7
Pyrene	47.1	49.0	4
Benzo(a)anthracene	17.7	21.5	19
Chrysene	25.7	30.9	18
Benzo(b)fluoranthene	20.5	27.1	28
Dibenzo(a,h)anthracene	10.2	15.2	39
Benzo(j)fluoranthene	9.02	14.6	47
Benzo(a)pyrene	14.6	24.6	51
Indeno(1,2,3-cd)pyrene	6.42	11.5	57
Dibenzo(a,h)anthracene	1.95	2.79	35
Benzo(g,h,i)perylene	9.16	17.1	60

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Target Analyte Quantitation

Raw data were not reviewed for Stage 2B validation.

XIII. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Data qualified due to continuing calibration %D, surrogate %R, LCS/LCSD %R and RPD are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 23H0177

Sample	Analyte	Flag	A or P	Reason (Code)
JW-RB-03-20230804	Benzo(k)fluoranthene	J (all detects)	A	Continuing calibration (%D) (5)
JW-PDI-025-SG-0-1-20230804	Acenaphthylene Benzo(k)fluoranthene	J (all detects) J (all detects)	A	Continuing calibration (%D) (5)
JW-PDI-020-SG-0-1-20230803 JW-PDI-1019-SG-0-1-20230803 JW-PDI-018-SG-0-1-20230803 JW-PDI-014-SG-0-1-20230803	Acenaphthylene Benzo(b)fluoranthene	J (all detects) J (all detects)	A	Continuing calibration (%D) (5)
JW-PDI-019-SG-0-1-20230803 JW-PDI-031-SG-0-1-20230803	Benzo(b)fluoranthene	J (all detects)	A	Continuing calibration (%D) (5)
JW-PDI-019-SG-0-1-20230803	All analytes	J (all detects) UJ (all non-detects)	P	Surrogates (%R) (13)
JW-RB-03-20230804	Pyrene Perylene	J (all detects) J (all detects)	P	Laboratory control samples (%R) (10)
JW-PDI-020-SG-0-1-20230803 JW-PDI-019-SG-0-1-20230803 JW-PDI-1019-SG-0-1-20230803 JW-PDI-031-SG-0-1-20230803 JW-PDI-018-SG-0-1-20230803 JW-PDI-014-SG-0-1-20230803 JW-PDI-025-SG-0-1-20230804	Naphthalene 2-Methylnaphthalene 1-Methylnaphthalene Acenaphthylene Acenaphthene Dibenzofuran Phenanthrene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Benzo(g,h,i)perylene	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P	Laboratory control samples (%R) (10)
JW-RB-03-20230804	Fluoranthene Pyrene Perylene	J (all detects) J (all detects) J (all detects)	P	Laboratory control samples (RPD) (10)

Jeld-Wen
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 23H0177

No Sample Data Qualified in this SDG

LDC #: 57827A2b

SDG #: 23H0177

Laboratory: Analytical Resources, Inc., Tukwila, WA

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

Date: 12/7/23

Page: 1 of 1

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW-846 Method 8270E-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	%RSD ≤20, r² ICV ≤30
IV.	Continuing calibration	SW	CCV ≤20
V.	Laboratory Blanks	SW	
VI.	Field blanks	SW	RB = 7
VII.	Surrogate spikes	SW	
VIII.	Matrix spike/Matrix spike duplicates	SW	
IX.	Laboratory control samples	SW	LCS/D
X.	Field duplicates	SW	D = 2, 3
XI.	Internal standards	A	
XII.	Target analyte quantitation	N	
XIII.	Target analyte identification	N	
XIV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID		Lab ID	Matrix	Date
1	JW-PDI-020-SB-0-1-20230803	G	23H0177-01	Soil	08/03/23
2	JW-PDI-019-SB-0-1-20230803	D G	23H0177-03	Soil	08/03/23
3	JW-PDI-1019-SB-0-1-20230803	D G	23H0177-05	Soil	08/03/23
4	JW-PDI-031-SB-0-1-20230803	G	23H0177-08	Soil	08/03/23
5	JW-PDI-018-SB-0-1-20230803	G	23H0177-09	Soil	08/03/23
6	JW-PDI-014-SB-0-1-20230803	G	23H0177-17	Soil	08/03/23
7	JW-RB-03-20230804		23H0177-21	Water	08/04/23
8	JW-PDI-025-SB-0-1-20230804	G	23H0177-22	Soil	08/04/23
9	JW-PDI-020-SB-0-1-20230803MS	G	23H0177-01MS	Soil	08/03/23
10	JW-PDI-020-SB-0-1-20230803MSD	G	23H0177-01MSD	Soil	08/03/23
11					

Notes:

-1	BLH0284-BLK1						
+2	BLH0362-BLK1						

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	CC. Dimethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	GGGG. C30-Hopane	I1. Methyl methanesulfonate
B. Bis (2-chloroethyl) ether	DD. Acenaphthylene	FFF. Di-n-octylphthalate	HHHH. 1-Methylphenanthrene	J1. Ethyl methanesulfonate
C. 2-Chlorophenol	EE. 2,6-Dinitrotoluene	GGG. Benzo(b)fluoranthene	IIII. 1,4-Dioxane	K1. o,o',o"-Triethylphosphorothioate
D. 1,3-Dichlorobenzene	FF. 3-Nitroaniline	HHH. Benzo(k)fluoranthene	JJJJ. Acetophenone	L1. n-Phenylene diamine
E. 1,4-Dichlorobenzene	GG. Acenaphthene	III. Benzo(a)pyrene	KKKK. Atrazine	M1. 1,4-Naphthoquinone
F. 1,2-Dichlorobenzene	HH. 2,4-Dinitrophenol	JJJ. Indeno(1,2,3-cd)pyrene	LLLL. Benzaldehyde	N1. N-Nitro-o-toluidine
G. 2-Methylphenol	II. 4-Nitrophenol	KKK. Dibenz(a,h)anthracene	MMMM. Caprolactam	O1. 1,3,5-Trinitrobenzene
H. 2,2'-Oxybis(1-chloropropane)	JJ. Dibenzofuran	LLL. Benzo(g,h,i)perylene	NNNN. 2,6-Dichlorophenol	P1. Pentachlorobenzene
I. 4-Methylphenol	KK. 2,4-Dinitrotoluene	MMM. Bis(2-Chloroisopropyl)ether	OOOO. 1,2-Diphenylhydrazine	Q1. 4-Aminobiphenyl
J. N-Nitroso-di-n-propylamine	LL. Diethylphthalate	NNN. Aniline	PPPP. 3-Methylphenol	R1. 2-Naphthylamine
K. Hexachloroethane	MM. 4-Chlorophenyl-phenyl ether	OOO. N-Nitrosodimethylamine	QQQQ. 3&4-Methylphenol	S1. Triphenylene
L. Nitrobenzene	NN. Fluorene	PPP. Benzoic Acid	RRRR. 4-Dimethyldibenzothiophene (4MDT)	T1. Octachlorostyrene
M. Isophorone	OO. 4-Nitroaniline	QQQ. Benzyl alcohol	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	U1. Famphur
N. 2-Nitrophenol	PP. 4,6-Dinitro-2-methylphenol	RRR. Pyridine	TTTT. 1-Methyldibenzothiophene (1MDT)	V1. 1,4-phenylenediamine
O. 2,4-Dimethylphenol	QQ. N-Nitrosodiphenylamine	SSS. Benzidine	UUUU.. 2,3,4,6-Tetrachlorophenol	W1. Methapyrilene
P. Bis(2-chloroethoxy)methane	RR. 4-Bromophenyl-phenylether	TTT. 1-Methylnaphthalene	VVVV. 1,2,4,5-Tetrachlorobenzene	X1. Pentachloroethane
Q. 2,4-Dichlorophenol	SS. Hexachlorobenzene	UUU.Benzo(b)thiophene	WWWW.. 2-Picoline	Y1. 3,3'-Dimethylbenzidine
R. 1,2,4-Trichlorobenzene	TT. Pentachlorophenol	VVV.Benzonaphthothiophene	XXXX. 3-Methylcholanthrene	Z1. o-Toluidine
S. Naphthalene	UU. Phenanthrene	WWW.Benzo(e)pyrene	YYYY. a,a-Dimethylphenethylamine	A2. 1-Naphthylamine
T. 4-Chloroaniline	VV. Anthracene	XXX. 2,6-Dimethylnaphthalene	ZZZZ. Hexachloropropene	B2. 4-Aminobiphenyl
U. Hexachlorobutadiene	WW. Carbazole	YYY. 2,3,5-Trimethylnaphthalene	A1. N-Nitrosodiethylamine	C2. 4-Nitroquinoline-1-oxide
V. 4-Chloro-3-methylphenol	XX. Di-n-butylphthalate	ZZZ. Perylene	B1. N-Nitrosodi-n-butylamine	D2. Hexachloropene
W. 2-Methylnaphthalene	YY. Fluoranthene	AAAA. Dibenzothiophene	C1. N-Nitrosomethylethylamine	E2. Bis (2-chloro-1-methylethyl) ether
X. Hexachlorocyclopentadiene	ZZ. Pyrene	BBBB. Benzo(a)fluoranthene	D1. N-Nitrosomorpholine	F2. Bifenthrin
Y. 2,4,6-Trichlorophenol	AAA. Butylbenzylphthalate	CCCC. Benzo(b)fluorene	E1. N-Nitrosopyrrolidine	G2. Cyfluthrin
Z. 2,4,5-Trichlorophenol	BBB. 3,3'-Dichlorobenzidine	DDDD. cis/trans-Decalin	F1. Phenacetin	H2. Cypermethrin
AA. 2-Chloronaphthalene	CCC. Benzo(a)anthracene	EEEE. 1,1'-Biphenyl	G1. 2-Acetylaminofluorene	I2. Permethrin (cis/trans)
BB. 2-Nitroaniline	DDD. Chrysene	FFFF. Retene	H1. Pronamide	J2. 5-Nitro-o-toluidine

LDC #: 57827A2b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270 E)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument?

(Y) N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?

Y (N) N/A Were all %D and RRFs within the validation criteria of ≤20%D and ≥0.05 RRF ? (5)

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	9/12/23 1124	SLI0115-ICV1	DD	22.0		7	J dw /A ND
			HHH	21.2		↓	↓ Det
	9/12/23 1437	SLI0115-ICV2	HHH	25.2		BLH0284-BLK1	J dw /A
	9/14/23 1822	SLI0187-ICV2	DD	FT ~~24.0~~ 26.4		8, BLH0362-BLK1	J dw /A all Det
			~~GGG~~ HHH	21.2		↓	J dw /A ↓
✓	9/15/23 1944	SLI0220-ICV2	DD	23.6		1, 3, 5, 6, 9, 10	J dw /A all Det
			GGG	26.0		↓	↓
	9/18/23 1048	SLI0244-ICV1	GGG	24.0		2, 4	J dw /A all Det

LDC #: 57827A2b

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270 E) SIM

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 8/15/23 **Blank analysis date:** 9/14/23
Conc. units: ng/kg Associated Samples: All Soils 7 5X

Compound	Blank ID	5X							
	BLH0362	BLK1	1 (10X)						
NN	0.08	0.4							
UU	0.32	1.6							
VV	0.10	0.5							
YY	0.27	1.35							
ZZ	0.23	1.15							
DDD	0.12	0.6							
GGG	0.07	0.35							

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID								

LDC #: 57827A26

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: FT

METHOD: GC/MS PAH (EPA SW 846 Method 8270E SIM)

(Y) N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds detected in the field blanks?

(6)

Sample: #7 = RB Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units (ug/L)
see following page	

Analytical Resources, LLC
Analytical Chemists and Consultants

JW-RB-03-20230804

Form I

ORGANIC ANALYSIS DATA SHEET

EPA 8270E-SIM

Polynuclear Aromatic Hydrocarbons - low level

RB = 7

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Jeld-Wen Step 1				
Matrix:	Water	Laboratory ID:	23H0177-21 C	SDG:	23H0177
Sampled:	08/04/23 10:50	Prepared:	08/11/23 11:35	File ID:	NT1823091207.D
% Solids:		Preparation:	EPA 3510C SepF	Analyzed:	09/12/23 14:05
Batch:	BLH0284	Sequence:	SLI0115	Initial/Final:	500 mL / 0.5 mL
Instrument:	NT18	Column:	ZB-5MS	Calibration:	GG00070
Cleanups:	Silica Gel				

CAS NO.	COMPOUND	DILUTION	(ug/L)	Q	DL	RL
91-20-3	Naphthalene S	1	0.006 ✓	J	0.006	0.010
91-57-6	2-Methylnaphthalene	1	0.010	U	0.007	0.010
90-12-0	1-Methylnaphthalene	1	0.010	U	0.008	0.010
208-96-8	Acenaphthylene	1	0.010	U	0.005	0.010
83-32-9	Acenaphthene	1	0.010	U	0.004	0.010
132-64-9	Dibenzofuran	1	0.010	U	0.006	0.010
86-73-7	Fluorene	1	0.010	U	0.004	0.010
85-01-8	Phenanthrene UU	1	0.074 ✓		0.005	0.010
120-12-7	Anthracene VV	1	0.020 ✓		0.005	0.010
86-74-8	Carbazole	1	0.010	U	0.005	0.010
206-44-0	Fluoranthene YY	1	0.088 ✓		0.006	0.010
129-00-0	Pyrene ZZ	1	0.160 ✓		0.008	0.010
56-55-3	Benzo(a)anthracene CCC	1	0.030 ✓		0.006	0.010
218-01-9	Chrysene DDD	1	0.039 ✓		0.008	0.010
205-99-2	Benzo(b)fluoranthene GGG	1	0.025 ✓		0.005	0.010
207-08-9	Benzo(k)fluoranthene HHH	1	0.017 ✓	Q	0.008	0.010
205-82-3	Benzo(j)fluoranthene ✓	1	0.017 ✓		0.005	0.010
	Benzofluoranthenes, Total ✓	1	0.059 ✓		0.017	0.020
50-32-8	Benzo(a)pyrene III	1	0.027 ✓		0.005	0.010
198-55-0	Perylene ZZZ	1	0.008 ✓	J	0.004	0.010
193-39-5	Indeno(1,2,3-cd)pyrene JJJ	1	0.018 ✓		0.008	0.010
53-70-3	Dibenzo(a,h)anthracene	1	0.010	U	0.008	0.010
191-24-2	Benzo(g,h,i)perylene LLL	1	0.100 ✓		0.009	0.010

SURROGATES	ADDED:(ug/L)	(ug/L)	% REC	QC LIMITS	Q
2-Methylnaphthalene-d10	0.30000	0.136	45.4	42 - 120	
Dibenzo[a,h]anthracene-d14	0.30000	0.116	38.7	29 - 120	
Fluoranthene-d10	0.30000	0.182	60.8	57 - 120	

LDC #: 57827A2b

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270 E)

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Were percent recoveries (%R) for surrogates within QC limits?
Y N (N/A) If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
Y N (N/A) If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

(13)

#	Sample ID	Surrogate	%R (Limits)	Qualifications
	1	KKK - d14	24.0 (30-160)	NQ
			( )	
			( )	
	2	W - d10	29.4 (↓)	J/UJ/P ND + Det
		KKK - d14	22.0 ( )	↓
			( )	
			( )	
	3,4,5,6	surrogates outside limit	( )	NQ, ± 5x PL
			( )	
			( )	
	8	KKK - d14	28.1 (30-160)	NQ
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	

(NBZ) = Nitrobenzene - d5
(FBP) = 2-Fluorobiphenyl
(TPH) = Terphenyl - d14
(2FP) = 2-Fluorophenol
(TBP) = 2,4,6 -Tribromophenol
(2CP) = 2-Chlorophenol - d4

LDC #: 57827A2b

VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: FT

METHOD: GCMS VOA (EPA SW 846 Method 8270 E)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?

[✓ Y] N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

(8)

#	MS/MSD ID	Compound	MS %Recovery	MSD %Recovery	MS/MSD %Recovery Limits	RPD (Limits)	Associated Samples	Qualifications
	9+10	Several	% R outside limit			( )	#1	NQ, ≥ 5×DL
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
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						( )		
						( )		
						( )		
						( )		
						( )		
						( )		

LDC #: 57827A2b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

METHOD: GC/MS SVOA (EPA SW 846 Method 8270~~C~~)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y (N) N/A Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?

%R
%RPD > (10)

Level ~~IV~~/D Only

Y N (N/A) Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

LCS/LCSD ID	Compound	LCS % Recovery	LCSD % Recovery	LCS/LCSD %Recovery limits	RPD (Limits)	Associated Samples	Qualifications
BLH0284-LCS/D	ZZ	141		60-140	( )	All water	J/UJ/P Det
	ZZZ	54.6	38.7	↓	( )	↓	J/UJ/P ↓
	YY				31.5 (30)		J/UJ/P
	ZZ				45.2 (↓)		
	ZZZ				34.1 (30)		
					( )		
					( )		
					( )		
BLH0362 LCS/D	See LCSD findings next page				( )	All soils	
					( )		
					( )	All %R =	J/UJ/P ~~ND+Det~~ All Det F7
					( )		
					( )		
					( )		
					( )		
					( )		
					( )		
					( )		
					( )		
					( )		
					( )		
					( )		
					( )		

Analytical Resources, LLC
Analytical Chemists and Consultants

LCS / LCS DUPLICATE RECOVERY

EPA 8270E-SIM

Laboratory:	Analytical Resources, LLC	SDG:	23H0177
Client:	Anchor QEA, LLC	Project:	Jeld-Wen Step 1
Matrix:	Solid	Analyzed:	09/14/23 20:31
Batch:	BLH0362	Laboratory ID:	BLH0362-BSD1
Preparation:	EPA 3546 (Microwave) Low Level	Sequence Name:	LCS Dup
Initial/Final:	10 g / 0.5 mL		

COMPOUND	SPIKE ADDED (ug/kg wet)	LCSD CONCENTRATION (ug/kg wet)	Q	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Naphthalene S	15.0	6.46	J|W|J|P	43.0 ✓	24.4	~~30~~ 35	~~30 - 160~~ 50-150
2-Methylnaphthalene W	15.0	6.51		43.4 ✓	25.0	30	30 - 160
1-Methylnaphthalene TTT	15.0	7.18		47.9 ✓	24.3	30	30 - 160
Acenaphthylene DD	15.0	7.24		48.3 ✓	19.4	30	30 - 160
Acenaphthene GG	15.0	6.66		44.4 ✓	24.3	30	30 - 160
Dibenzofuran JJ	15.0	6.75		45.0 ✓	17.5	30	30 - 160
Fluorene	15.0	7.58		50.6	24.0	30	30 - 160
Phenanthrene UU	15.0	7.19		47.9 ✓	26.9	30	30 - 160
Anthracene	15.0	7.56		50.4	23.6	30	30 - 160
Fluoranthene	15.0	8.32		55.5	25.0	30	30 - 160
Pyrene	15.0	8.64		57.6	24.7	30	30 - 160
Benzo(a)anthracene	15.0	9.19		61.3	22.7	30	30 - 160
Chrysene	15.0	9.15		61.0	23.5	30	30 - 160
Benzo(b)fluoranthene	15.0	10.1		67.1	27.0	30	30 - 160
Benzo(k)fluoranthene	15.0	8.83		58.9	25.8	30	30 - 160
Benzo(j)fluoranthene	15.0	8.63		57.5	23.8	30	30 - 160
Benzo(a)pyrene III	15.0	6.80		45.3 ✓	24.7	30	30 - 160
Indeno(1,2,3-cd)pyrene JJJ	15.0	6.79		45.3 ✓	27.4	30	30 - 160
Dibenzo(a,h)anthracene KKK	15.0	6.55		43.7 ✓	28.7	30	30 - 160
Benzo(g,h,i)perylene LLL	15.0	7.37		49.1 ✓	28.1	~~30~~	~~30 - 160~~

* Indicates values outside of QC limits

LDC#: 57827A2b **VALIDATION FINDINGS WORKSHEET** Page: 1 of 1
Field Duplicates Reviewer: FT

METHOD: GCMS VOA (EPA SW 846 Method 8260B)

Compound	Concentration (ug/kg)		RPD
	2	3	
S	26.5	17.9	39
W	9.21	5.21	55
TTT	5.88	3.21	59
DD	4.41	4.48	2
GG	6.50	3.10	71
JJ	6.93	4.48	43
NN	9.05	5.47	49
UU	32.7	23.9	31
VV	12.6	9.34	30
YY	53.1	49.6	7
ZZ	47.1	49.0	4
CCC	17.7	21.5	19
DDD	25.7	30.9	18
GGG	20.5	27.1	28
KKK	10.2	15.2	39
Benzo(j)fluoranthene	9.02	14.6	47
III	14.6	24.6	51
JJJ	6.42	11.5	57
KKK	1.95	2.79	35
LLL	9.16	17.1	60

V:\FIELD DUPLICATES\Field Duplicates\FD_Organics\2023\57827A2b_Anchor Jed Wen.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: December 13, 2023

Parameters: Polychlorinated Biphenyls

Validation Level: Stage 2B & 4

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0177

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-PDI-020-SG-0-1-20230803**	23H0177-01**	Soil	08/03/23
JW-PDI-019-SG-0-1-20230803	23H0177-03	Soil	08/03/23
JW-PDI-1019-SG-0-1-20230803	23H0177-05	Soil	08/03/23
JW-PDI-018-SG-0-1-20230803	23H0177-09	Soil	08/03/23
JW-PDI-014-SG-0-1-20230803	23H0177-17	Soil	08/03/23
JW-RB-03-20230804	23H0177-21	Water	08/04/23
JW-PDI-025-SG-0-1-20230804	23H0177-22	Soil	08/04/23
JW-PDI-020-SG-0-1-20230803MS	23H0177-01MS	Soil	08/03/23
JW-PDI-020-SG-0-1-20230803MSD	23H0177-01MSD	Soil	08/03/23

**Indicates sample underwent Stage 4 validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Stage 4 data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all analytes.

Retention time windows were established as required by the method for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all analytes.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all analytes.

Retention times of all analytes in the calibration standards were within the established retention time windows for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample JW-RB-03-20230804 was identified as a rinse blank. No contaminants were found.

VI. Surrogates/Internal Standards

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Column	Surrogate	%R (40-133)	Affected Analyte	Flag	A or P
JW-PDI-020-SG-0-1-20230803**	Col. 2	Decachlorobiphenyl	141	All analytes	J (all detects)	P
JW-PDI-1019-SG-0-1-20230803	Col. 2	Decachlorobiphenyl	140	All analytes	NA	-

All internal standard areas and retention times were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

Samples JW-PDI-019-SG-0-1-20230803 and JW-PDI-1019-SG-0-1-20230803 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/Kg)		RPD
	JW-PDI-019-SG-0-1-20230803	JW-PDI-1019-SG-0-1-20230803	
Aroclor-1254	10.3	19.9U	Not calculable

X. Target Analyte Quantitation

All target analyte quantitation met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XI. Target Analyte Identification

All target analyte identifications met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Data qualified due to surrogate %R are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polychlorinated Biphenyls - Data Qualification Summary - SDG 23H0177

Sample	Analyte	Flag	A or P	Reason (Code)
JW-PDI-020-SG-0-1-20230803**	All analytes	J (all detects)	P	Surrogates (%R) (13)

Jeld-Wen
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG 23H0177

No Sample Data Qualified in this SDG

LDC #: 57827A3b
SDG #: 23H0177
Laboratory: Analytical Resources, Inc., Tukwila, WA

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/4

Date: 12/7/23
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC Polychlorinated Biphenyls (EPA SW-846 Method 8082A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A/A	%D RSD / ICV ≤ 20
III.	Continuing calibration	A	CCV ≤ 20
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	RB = 6
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	SW	D = 2, 3
X.	Target analyte quantitation	A	Not reviewed for Stage 2B validation.
XI.	Target analyte identification	A	Not reviewed for Stage 2B validation.
XII	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Indicates sample underwent Stage 4 validation

	Client ID		Lab ID	Matrix	Date
1	JW-PDI-020-SB-0-1-20230803**	G	23H0177-01**	Soil	08/03/23
2	JW-PDI-019-SB-0-1-20230803	G D	23H0177-03	Soil	08/03/23
3	JW-PDI-1019-SB-0-1-20230803	G D	23H0177-05	Soil	08/03/23
4	JW-PDI-018-SB-0-1-20230803	G	23H0177-09	Soil	08/03/23
5	JW-PDI-014-SB-0-1-20230803	G	23H0177-17	Soil	08/03/23
6	JW-RB-03-20230804		23H0177-21	Water	08/04/23
7	JW-PDI-025-SB-0-1-20230804	G	23H0177-22	Soil	08/04/23
8	JW-PDI-020-SB-0-1-20230803MS	G	23H0177-01MS	Soil	08/03/23
9	JW-PDI-020-SB-0-1-20230803MSD	G	23H0177-01MSD	Soil	08/03/23
10					
11					
12					
13					

Notes:

1	BLH0289-BLK1						
2	BLH0357-BLK1						

LDC #: 57827A3b

VALIDATION FINDINGS CHECKLIST

Method: ✓ GC ___ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
IIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥0.990?			✓	
Were the RT windows properly established?	✓			
IIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20%?	✓			
Were all the retention times within the acceptance windows?	✓			
IV. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks?		✓		
V. Field Blanks				
Were field blanks identified in this SDG?		✓		
Were target compounds detected in the field blanks?			✓	
VI. Surrogate spikes				
Were all surrogate percent recovery (%R) within the QC limits?	✓	✓		
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?		✓	.	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
VIII. Laboratory control samples				
Was an LCS analyzed per analytical or extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				

Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
X. Compound quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG. Chlordane
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH. Chlordane (Technical)
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II. Aroclor 1262
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ. Aroclor 1268
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. 2,4'-DDD	KK. Oxychlordane
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. 2,4'-DDE	LL. trans-Nonachlor
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE. 2,4'-DDT	MM. cis-Nonachlor
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF. Hexachlorobenzene	NN.

Notes:_____

LDC #: 57827 A3b

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

METHOD: GC ___ HPLC

Are surrogates required by the method? Yes___ or No___.

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were surrogates spiked into all samples and blanks?

Y N N/A Did all surrogate recoveries (%R) meet the QC limits?

(13)

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	1	col 2	8	141 (40 - 133)	J dw/p ND + Pct
	3	↓	8	140 (↓)	J dw/p ND
	BLH0357-BLK1	col 1	8	48.6 (53 - 120)	J/UJ/P
		col 2	Y	48.3 (↓)	↓

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	Chloro-octadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-Dichlorophenylacetic acid
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate	CC	2,5-Dibromotoluene
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 57827A3b

VALIDATION FINDINGS WORKSHEET
Field Duplicates

METHOD: ✓ **GC** __ **HPLC**

Y N N/A Were field duplicate pairs identified in this SDG?

Y N N/A Were target analytes detected in the field duplicate pairs?

Compound	Concentration (ug/kg)		%RPD Limit (≤ %)	Qualification (Parent only)
	2	3		
AA	10.3	19.9 U	NC	

Compound	Concentration ( )		%RPD Limit (≤ %)	Qualification (Parent only)

Compound	Concentration ( )		%RPD Limit (≤ %))	Qualification (Parent only)

LDC #: 57827A3b

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT

METHOD: GC PCB (EPA SW 846 Method 8082)

The calibration factors (CF) and relative standard deviation (%RSD) were recalculated using the following calculations:

CF = A/C
Average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

Where: A = Area of compound
C = Concentration of compound
S = Standard deviation of calibration factors
X = Mean of calibration factors

#	Standard ID	Calibration Date	Compound	Reported RRF (250 ug/Ll std)	Recalculated RRF (250 ug/L std)	Reported Ave RRF(initial)	Recalculated Ave RRF(intial)	Reported %RSD	Recalculated %RSD
1	ICAL	08/19/23	PCB 1260-1 ZB5	4.235272e-2	4.2657719e-2	4.192872e-2	4.192872e-2	5.9	5.9
	GH0059		PCB 1260-1 ZB35	4.358216e-2	4.3896e-2	4.473978e-2	4.473978e-2	7.8	7.8
2									
3									
4									

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 57827 A36

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT

METHOD: GC ✓ HPLC _____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF -CF)/ave.CF

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(ICAL)/ CCV Conc.	Reported CF/ Conc. CCV	Recalculated CF/ Conc. CCV	Reported %D	Recalculated %D
1	SLI0050 ICV2	9/4/23 1650	1260-1 col1	250	239	239	4.4	4.4
			↓ 2	250	~~239~~ 260	260	4.0	4.0
					FT			
2	SLI0050-CCV2	9/5/23 0031	↓ col1	↓	251	251	0.4	0.4
			↓ col2	↓	265	265	6.0	6.0
3								
4								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 57827A3b

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: FT

METHOD: ✓ GC ___ HPLC

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 7

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
DCB	col 1	40.0	~~38.5~~	96.2	96.2	0
TCMX #7	1		33.2	83.0	83.0	
DCB	col 2		42.9	107	107	
~~TCMX~~	2	↓	33.1	82.8	82.9	↓

Sample ID: #1

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
DCB	col 1	40.0	51.0	128	128	0
TCMX	col 1		45.2	113	113	
DCB	col 2		56.4	141	141	
TCMX	col 2	↓	45.6	114	114	↓

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	Chloro-octadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-Dichlorophenylacetic acid
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate	CC	2,5-Dibromotoluene
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 57827A3b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FT

METHOD: ✓ **GC** __ **HPLC**

The percent recoveries (%R) and relative percent differences (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA

RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100

Where SSC = Spiked sample concentration; SC = Sample concentration; SA = Spike added; MS = Matrix spike; MSD = Matrix spike duplicate

MS/MSD samples: 8 + 9

Compound	Spike Added (ug/Kg)		Sample Conc. (ug/Kg)	Spike Sample Concentration (ug/Kg)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	---	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Aroclor 1260	500	500	10.5	334	334	64.8	64.8	64.7	64.7	0.141	0.141

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 57827A36

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: FT

METHOD: ✓ GC ___HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC/SA)
RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100

Where SSC = Spiked sample concentration; SA = Spike added
LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples: BLH0357 - LCS ID

Compound	Spike Added (ug/kg)		Spike Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Aroclor 1260	500	500	323	303	64.7	64.7	60.6	60.6	6.57	6.57

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 57827A3b

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: FT

METHOD: ✓ GC __ HPLC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration= (A)(Fv)(Df) / (RF)(Vs or Ws)(%S/100)

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. #1 Compound Name AA

Concentration = 23.448 (5) / (10.16)(0.4922) =

= 23.44 ug/kg

5/10.16
%S = 49.22
Col 2 =

#	Sample ID	Compound	Reported Concentrations (ug/kg)	Recalculated Results Concentrations (ug/kg)	Qualifications
	#1	AA	23.4	23.44	
	1254-1 = 5606 (80) / (409273)(4.776252 X 10^-2)			1254-1 = 22.94	
				2 = 26.0	
				3 = 17.8	
		= 22.94		4 = 21.4	
				5 = 29.1	
				23.44 ✓	

Comments: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: November 16, 2023

Parameters: Wet Chemistry

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA/
Materials Testing & Consulting, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0177/23B014-13

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-PDI-020-SG-0-1-20230803	23H0177-01/B23-0804	Soil	08/03/23
JW-PDI-019-SG-0-1-20230803	23H0177-03/B23-0807	Soil	08/03/23
JW-PDI-1019-SG-0-1-20230803	23H0177-05/B23-0808	Soil	08/03/23
JW-PDI-031-SG-0-1-20230803	23H0177-08/B23-0809	Soil	08/03/23
JW-PDI-018-SG-0-1-20230803	23H0177-09/B23-0810	Soil	08/03/23
JW-PDI-027-SG-0-1-20230803	23H0177-10/B23-0811	Soil	08/03/23
JW-PDI-026-SG-0-1-20230803	23H0177-12/B23-0812	Soil	08/03/23
JW-PDI-014-SG-0-1-20230803	23H0177-17/B23-0813	Soil	08/03/23
JW-PDI-021-SG-0-1-20230803	23H0177-18/B23-0814	Soil	08/03/23
JW-PDI-022-SG-0-1-20230803	23H0177-19/B23-0815	Soil	08/03/23
JW-PDI-1022-SG-0-1-20230803	23H0177-20/B23-0816	Soil	08/03/23
JW-PDI-025-SG-0-1-20230804	23H0177-22/B23-0817	Soil	08/04/23
JW-PDI-020-SG-0-1-20230803DUP	23H0177-01/B23-0805DUP	Soil	08/03/23
JW-PDI-020-SG-0-1-20230803TRP	23H0177-01/B23-0806TRP	Soil	08/03/23

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Moisture Content by American Society for Testing and Material (ASTM) C556 and ASTM D2216
Organic Matter by ASTM D2974
Total Solids by ASTM D2216

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

Initial calibration analysis was not required by the methods.

III. Continuing Calibration

Continuing calibration frequency and analysis was not required by the methods.

IV. Laboratory Blanks

Laboratory blank analysis was not required by the methods.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the methods.

VII. Triplicate Sample Analysis

Triplicate (TRP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

TRP ID (Associated Samples)	Analyte	%RSD (≤20)	Flag	A or P
JW-PDI-020-SG-0-1-20230803TRP (JW-PDI-020-SG-0-1-20230803 JW-PDI-019-SG-0-1-20230803 JW-PDI-1019-SG-0-1-20230803 JW-PDI-031-SG-0-1-20230803 JW-PDI-018-SG-0-1-20230803 JW-PDI-027-SG-0-1-20230803 JW-PDI-026-SG-0-1-20230803 JW-PDI-014-SG-0-1-20230803 JW-PDI-021-SG-0-1-20230803 JW-PDI-022-SG-0-1-20230803 JW-PDI-1022-SG-0-1-20230803 JW-PDI-025-SG-0-1-20230804)	Moisture Content	25	J (all detects)	A

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were not required by the methods.

IX. Field Duplicates

Samples JW-PDI-019-SG-0-1-20230803 and JW-PDI-1019-SG-0-1-20230803 and samples JW-PDI-022-SG-0-1-20230803 and JW-PDI-1022-SG-0-1-20230803 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (%)		RPD
	JW-PDI-019-SG-0-1-20230803	JW-PDI-1019-SG-0-1-20230803	
Moisture Content	97.2	96.0	1
Organic Content	3.57	3.51	2
Total Solids	48.91	49.35	1

Analyte	Concentration (%)		RPD
	JW-PDI-022-SG-0-1-20230803	JW-PDI-1022-SG-0-1-20230803	
Moisture Content	73.8	83.2	12
Organic Content	5.36	5.38	0
Total Solids	53.24	54.70	3

X. Target Analyte Quantitation

Raw data were not reviewed for Stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Data qualified due to TRP %RSD are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Wet Chemistry - Data Qualification Summary - SDG 23H0177/23B014-13

Sample	Analyte	Flag	A or P	Reason (Code)
JW-PDI-020-SG-0-1-20230803 JW-PDI-019-SG-0-1-20230803 JW-PDI-1019-SG-0-1-20230803 JW-PDI-031-SG-0-1-20230803 JW-PDI-018-SG-0-1-20230803 JW-PDI-027-SG-0-1-20230803 JW-PDI-026-SG-0-1-20230803 JW-PDI-014-SG-0-1-20230803 JW-PDI-021-SG-0-1-20230803 JW-PDI-022-SG-0-1-20230803 JW-PDI-1022-SG-0-1-20230803 JW-PDI-025-SG-0-1-20230804	Moisture Content	J (all detects)	A	Triplicate sample analysis (%RSD) (24)

Jeld-Wen
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 23H0177/23B014-13

No Sample Data Qualified in this SDG

LDC #: 57827A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/15/23
SDG #: 23H0177/23B014-13 Stage 2B Page: 1 of 1
Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer: NF
Sub-Laboratory: Materials Testing & Consulting, Inc., Tukwila, WA 2nd Reviewer: AC

METHOD: (Analyte) Moisture Content (ASTM C556/ASTM D2216), Organic Matter (ASTM D2974), Total Solids (ASTM D2216)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II	Initial calibration	N	
III.	Calibration verification	N	
IV	Laboratory Blanks	N	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	N	
VII.	Duplicate sample analysis	SW	
VIII.	Laboratory control samples	N	
IX.	Field duplicates	SW	FD= (2,3) (10,11)
X.	Target Analyte Quantitation	N	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Sub-Lab ID	Lab ID	Matrix	Date
1	JW-PDI-020-~~SB~~SG-0-1-20230803	B23-0804	23H0177-01	Soil	08/03/23
2	JW-PDI-019-~~SB~~SG-0-1-20230803	B23-0807	23H0177-03	Soil	08/03/23
3	JW-PDI-1019-~~SB~~SG-0-1-20230803	B23-0808	23H0177-05	Soil	08/03/23
4	JW-PDI-031-~~SB~~SG-0-1-20230803	B23-0809	23H0177-08	Soil	08/03/23
5	JW-PDI-018-~~SB~~SG-0-1-20230803	B23-0810	23H0177-09	Soil	08/03/23
6	JW-PDI-027-~~SB~~SG-0-1-20230803	B23-0811	23H0177-10	Soil	08/03/23
7	JW-PDI-026-~~SB~~SG-0-1-20230803	B23-0812	23H0177-12	Soil	08/03/23
8	JW-PDI-014-~~SB~~SG-0-1-20230803	B23-0813	23H0177-17	Soil	08/03/23
9	JW-PDI-021-~~SB~~SG-0-1-20230803	B23-0814	23H0177-18	Soil	08/03/23
10	JW-PDI-022-~~SB~~SG-0-1-20230803	B23-0815	23H0177-19	Soil	08/03/23
11	JW-PDI-1022-~~SB~~SG-0-1-20230803	B23-0816	23H0177-20	Soil	08/03/23
12	JW-PDI-025-~~SB~~SG-0-1-20230804	B23-0817	23H0177-22	Soil	08/04/23
13	JW-PDI-020-~~SB~~SG-0-1-20230803DUP	B23-0805	23H0177-01DUP	Soil	08/03/23
14	JW-PDI-020-~~SB~~SG-0-1-20230803TRP	B23-0806	23H0177-01TRP	Soil	08/03/23
15					

Notes:

All elements are applicable to each sample as noted below.

Sample ID	Target Analyte List
1-12	Moisture Content, Organic Matter
1-3, 5-6, 8, 10-12	Total Solids
QC	
13-14	Moisture Content, Organic Matter

Laboratory Duplicates

Reviewer: NF

METHOD: Inorganics

Laboratory duplicate analysis was performed by the laboratory. All laboratory duplicates were within the relative percent difference (RPD) for samples >5X the reporting limits with the exceptions listed below. If samples were <5X the reporting limits, the difference was within 1X the reporting limit for water samples and within 2X the reporting limit for soil samples for all samples with the

Duplicate ID	Triplicate ID	Matrix	Analyte	RPD	RPD Limit	RSD	RSD Limit	Associated Samples	Qualification	Det/ND
~~13~~	~~14~~	~~soil~~	~~Moisture Content~~	~~39~~	~~20~~			~~1-12~~	~~Jdet/A (9)~~	~~Det~~
13	14	soil	Moisture Content			25	20	1-12	Jdet/A (25)	Det

Comments:

METHOD: Inorganics

Analyte	Concentration (%)		RPD
	2	3	
Moisture Content	97.2	96.0	1
Organic Content	3.57	3.51	2
Total Solids	48.91	49.35	1

Analyte	Concentration (%)		RPD
	10	11	
Moisture Content	73.8	83.2	12
Organic Content	5.36	5.38	0
Total Solids	53.24	54.70	3

LDC Report# 57827A21

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: December 14, 2023

Parameters: Polychlorinated Dioxins/Dibenzofurans

Validation Level: Stage 2B & 4

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0177

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-PDI-020-SG-0-1-20230803**	23H0177-01**	Soil	08/03/23
JW-PDI-013-SG-0-1-20230803	23H0177-02	Soil	08/03/23
JW-PDI-019-SG-0-1-20230803	23H0177-03	Soil	08/03/23
JW-PDI-012-SG-0-1-20230803	23H0177-04	Soil	08/03/23
JW-PDI-1019-SG-0-1-20230803	23H0177-05	Soil	08/03/23
JW-PDI-011-SG-0-1-20230803	23H0177-06	Soil	08/03/23
JW-PDI-010-SG-0-1-20230803	23H0177-07	Soil	08/03/23
JW-PDI-018-SG-0-1-20230803	23H0177-09	Soil	08/03/23
JW-PDI-027-SG-0-1-20230803**	23H0177-10**	Soil	08/03/23
JW-PDI-007-SG-0-1-20230803	23H0177-11	Soil	08/03/23
JW-PDI-008-SG-0-1-20230803	23H0177-13	Soil	08/03/23
JW-PDI-009-SG-0-1-20230803**	23H0177-14**	Soil	08/03/23
JW-PDI-002-SG-0-1-20230803	23H0177-15	Soil	08/03/23
JW-PDI-001-SG-0-1-20230803	23H0177-16	Soil	08/03/23
JW-PDI-014-SG-0-1-20230803	23H0177-17	Soil	08/03/23
JW-PDI-022-SG-0-1-20230803	23H0177-19	Soil	08/03/23
JW-PDI-1022-SG-0-1-20230803	23H0177-20	Soil	08/03/23
JW-RB-03-20230804	23H0177-21	Water	08/04/23
JW-PDI-025-SG-0-1-20230804	23H0177-22	Soil	08/04/23
JW-PDI-006-SG-0-1-20230804	23H0177-23	Soil	08/04/23
JW-PDI-020-SG-0-1-20230803DUP	23H0177-01DUP	Soil	08/03/23

**Indicates sample underwent Stage 4 validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for High Resolution Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Dioxins/Dibenzofurans by Environmental Protection Agency (EPA) Method 1613B

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Stage 4 data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25%.

The static resolving power was at least 10,000 (10% valley definition).

III. Initial Calibration and Initial Calibration Verification

A five point initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all analytes and less than or equal to 35.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The minimum S/N ratio was greater than or equal to 10 for each analyte and labeled compound associated to samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

The percent differences (%D) of the initial calibration verification (ICV) standard were within the QC limits for all analytes and labeled compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration results were within the QC limits for all analytes and labeled compounds with the following exceptions:

Date	Analyte	Concentration (85-118 ng/mL)	Associated Samples	Affected Analyte	Flag	A or P
10/03/23	13C12-1,2,3,6,7,8-HxCDD	80	JW-PDI-027-SG-0-1-20230803** JW-PDI-007-SG-0-1-20230803 JW-PDI-008-SG-0-1-20230803 JW-PDI-009-SG-0-1-20230803** JW-PDI-002-SG-0-1-20230803 JW-PDI-001-SG-0-1-20230803 JW-PDI-014-SG-0-1-20230803 JW-PDI-022-SG-0-1-20230803 JW-PDI-1022-SG-0-1-20230803 JW-PDI-025-SG-0-1-20230804 JW-PDI-006-SG-0-1-20230804	1,2,3,6,7,8-HxCDD Total HxCDD	J (all detects) J (all detects)	P

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The minimum S/N ratio was greater than or equal to 10 for each analyte and labeled compound associated to samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Analyte	Concentration (pg/L)	Associated Samples
BLH0234-BLK2	08/09/23	OCDD	194	All water samples in SDG 23H0177

Blank ID	Extraction Date	Analyte	Concentration (ng/Kg)	Associated Samples
BLH0347-BLK1	08/15/23	OCDD	0.839	All soil samples in SDG 23H0177

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration (pg/L)	Modified Final Concentration (pg/L)
JW-RB-03-20230804	OCDD	82.0	82.0U

VI. Field Blanks

Sample JW-RB-03-20230804 was identified as a rinse blank. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration (pg/L)
JW-RB-03-20230804	OCDD	82.0

VII. Matrix Spike/Matrix Spike Duplicates/Duplicate Sample Analysis

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples JW-PDI-019-SG-0-1-20230803 and JW-PDI-1019-SG-0-1-20230803 and samples JW-PDI-022-SG-0-1-20230803 and JW-PDI-1022-SG-0-1-20230803 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/Kg)		RPD
	JW-PDI-019-SG-0-1-20230803	JW-PDI-1019-SG-0-1-20230803	
2,3,7,8-TCDF	2.09	2.29	9
2,3,7,8-TCDD	0.408	0.413	1
1,2,3,7,8-PeCDF	0.953	0.812	16
2,3,4,7,8-PeCDF	1.01	0.931	8
1,2,3,7,8-PeCDD	1.37	1.34	2
1,2,3,4,7,8-HxCDF	1.69	1.48	13
1,2,3,6,7,8-HxCDF	1.63	1.35	19
2,3,4,6,7,8-HxCDF	2.59	2.27	13
1,2,3,7,8,9-HxCDF	0.711	0.627	13
1,2,3,4,7,8-HxCDD	1.39	1.57	12
1,2,3,6,7,8-HxCDD	15.8	15.9	1
1,2,3,7,8,9-HxCDD	7.22	7.19	0
1,2,3,4,6,7,8-HpCDF	34.0	34.4	1
1,2,3,4,7,8,9-HpCDF	1.78	1.54	14
1,2,3,4,6,7,8-HpCDD	146	153	5
OCDF	46.1	45.4	2
OCDD	839	818	3
Total TCDF	19.6	20.2	3
Total TCDD	18.6	31.0	50
Total PeCDF	21.0	19.3	8
Total PeCDD	14.6	16.6	13

Analyte	Concentration (ng/Kg)		RPD
	JW-PDI-019-SG-0-1-20230803	JW-PDI-1019-SG-0-1-20230803	
Total HxCDF	51.8	45.7	13
Total HxCDD	113	114	1
Total HpCDF	92.3	92.0	0
Total HpCDD	305	318	4

Analyte	Concentration (ng/Kg)		RPD
	JW-PDI-022-SG-0-1-20230803	JW-PDI-1022-SG-0-1-20230803	
2,3,7,8-TCDF	1.23	1.27	9
2,3,7,8-TCDD	0.278	0.349	23
1,2,3,7,8-PeCDF	0.409	0.426	4
2,3,4,7,8-PeCDF	0.503	0.445	12
1,2,3,7,8-PeCDD	0.728	0.712	2
1,2,3,4,7,8-HxCDF	0.644	0.666	3
1,2,3,6,7,8-HxCDF	0.559	0.700	22
2,3,4,6,7,8-HxCDF	0.910	0.806	12
1,2,3,7,8,9-HxCDF	0.219	0.265	19
1,2,3,4,7,8-HxCDD	0.738	0.700	5
1,2,3,6,7,8-HxCDD	4.73	3.90	19
1,2,3,7,8,9-HxCDD	2.71	2.35	14
1,2,3,4,6,7,8-HpCDF	10.9	10.6	3
1,2,3,4,7,8,9-HpCDF	0.632	0.623	1
1,2,3,4,6,7,8-HpCDD	56.1	50.0	11
OCDF	17.3	18.6	7
OCDD	368	366	1
Total TCDF	8.13	6.37	24
Total TCDD	14.2	16.5	15
Total PeCDF	5.58	4.13	30
Total PeCDD	7.40	8.34	12
Total HxCDF	17.5	13.7	24
Total HxCDD	46.3	36.8	23
Total HpCDF	29.3	27.7	6
Total HpCDD	150	126	17

X. Labeled Compounds

All percent recoveries (%R) for labeled compounds used to quantitate target analytes were within QC limits.

XI. Target Analyte Quantitation

All target analyte quantitations were within validation criteria with the following exceptions:

Sample	Analyte	Flag	A or P
All soil samples in SDG 23H0177	All analytes reported by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A

Raw data were not reviewed for Stage 2B validation.

XII. Target Analyte Identification

All target analyte identifications met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Data qualified due to continuing calibration %D, results reported by the laboratory as EMPCs, and laboratory blank contamination are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Data Qualification Summary - SDG 23H0177

Sample	Analyte	Flag	A or P	Reason (Code)
JW-PDI-027-SG-0-1-20230803** JW-PDI-007-SG-0-1-20230803 JW-PDI-008-SG-0-1-20230803 JW-PDI-009-SG-0-1-20230803** JW-PDI-002-SG-0-1-20230803 JW-PDI-001-SG-0-1-20230803 JW-PDI-014-SG-0-1-20230803 JW-PDI-022-SG-0-1-20230803 JW-PDI-1022-SG-0-1-20230803 JW-PDI-025-SG-0-1-20230804 JW-PDI-006-SG-0-1-20230804	1,2,3,6,7,8-HxCDD Total HxCDD	J (all detects) J (all detects)	P	Continuing calibration (%D) (5)
JW-PDI-020-SG-0-1-20230803** JW-PDI-013-SG-0-1-20230803 JW-PDI-019-SG-0-1-20230803 JW-PDI-012-SG-0-1-20230803 JW-PDI-1019-SG-0-1-20230803 JW-PDI-011-SG-0-1-20230803 JW-PDI-010-SG-0-1-20230803 JW-PDI-018-SG-0-1-20230803 JW-PDI-027-SG-0-1-20230803** JW-PDI-007-SG-0-1-20230803 JW-PDI-008-SG-0-1-20230803 JW-PDI-009-SG-0-1-20230803** JW-PDI-002-SG-0-1-20230803 JW-PDI-001-SG-0-1-20230803 JW-PDI-014-SG-0-1-20230803 JW-PDI-022-SG-0-1-20230803 JW-PDI-1022-SG-0-1-20230803 JW-PDI-025-SG-0-1-20230804 JW-PDI-006-SG-0-1-20230804	All analytes reported by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A	Target analyte quantitation (EMPC) (23)

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG 23H0177

Sample	Analyte	Modified Final Concentration (pg/L)	A or P	Code
JW-RB-03-20230804	OCDD	82.0U	A	7

LDC #: 57827A21 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/7/23
SDG #: 23H0177 Stage 2B/4 Page: 1 of 1
Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer:
2nd Reviewer:

METHOD: HRGC/HRMS Polychlorinated Dioxins/Dibenzofurans (EPA Method 1613B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	%D PSD ≤ 20/35 ICV ≥ QC limits
IV.	Continuing calibration	A	CCV = QC limits
V.	Laboratory Blanks	SW	
VI.	Field blanks	SW	FR RB = 18
VII.	Matrix spike/Matrix spike duplicates LCMP	N/A	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	SW	D= 3,5 16, 17
X.	Labeled Compounds	SW	
XI.	Target analyte quantitation	SW	Not reviewed for Stage 2B validation.
XII.	Target analyte identification	A	Not reviewed for Stage 2B validation.
XIII.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Stage 4 validation ** Stage 4

	Client ID	Lab ID	Matrix	Date
1	JW-PDI-020-SB-0-1-20230803 **	23H0177-01 **	Soil	08/03/23
2	JW-PDI-013-SB-0-1-20230803	23H0177-02	Soil	08/03/23
3	JW-PDI-019-SB-0-1-20230803 D	23H0177-03	Soil	08/03/23
4	JW-PDI-012-SB-0-1-20230803	23H0177-04	Soil	08/03/23
5	JW-PDI-1019-SB-0-1-20230803 D	23H0177-05	Soil	08/03/23
6	JW-PDI-011-SB-0-1-20230803	23H0177-06	Soil	08/03/23
7	JW-PDI-010-SB-0-1-20230803	23H0177-07	Soil	08/03/23
8	JW-PDI-018-SB-0-1-20230803	23H0177-09	Soil	08/03/23
9	JW-PDI-027-SB-0-1-20230803 **	23H0177-10 **	Soil	08/03/23
10	JW-PDI-007-SB-0-1-20230803	23H0177-11	Soil	08/03/23
11	JW-PDI-008-SB-0-1-20230803	23H0177-13	Soil	08/03/23
12	JW-PDI-009-SB-0-1-20230803 **	23H0177-14 **	Soil	08/03/23
13	JW-PDI-002-SB-0-1-20230803	23H0177-15	Soil	08/03/23
14	JW-PDI-001-SB-0-1-20230803	23H0177-16	Soil	08/03/23
15	JW-PDI-014-SB-0-1-20230803	23H0177-17	Soil	08/03/23
16	JW-PDI-022-SB-0-1-20230803	23H0177-19	Soil	08/03/23

LDC #: 57827A21 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/7/23
SDG #: 23H0177 Stage 2B/4 Page: 2 of 2
Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer: PT
2nd Reviewer: AC

METHOD: HRGC/HRMS Polychlorinated Dioxins/Dibenzofurans (EPA Method 1613B)

	Client ID	Lab ID	Matrix	Date
17 2	JW-PDI-1022-SB-0-1-20230803	23H0177-20	Soil	08/03/23
18 1	JW-RB-03-20230804	23H0177-21	Water	08/04/23
19 2	JW-PDI-025-SB-0-1-20230804	23H0177-22	Soil	08/04/23
20 2	JW-PDI-006-SB-0-1-20230804	23H0177-23	Soil	08/04/23
21 2	JW-PDI-020-SB-0-1-20230803DUP	23H0177-01DUP	Soil	08/03/23
22				
23				
24				

Notes:

1	BLH0284-BLK1						
2	BLH0362-BLK1						
	47						

Note: Lab dup criteria: LCS/D % RPD or MS/MSD % RPD ≤ 35% was used.

(Lab dup) Lab Reported % RPD = 28% for N (Result < 5x RL)

LDC #: 57827 A21 **VALIDATION FINDINGS CHECKLIST** Page: 1 of 2
Reviewer: FT

Method: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Was PFK exact mass 380.9760 verified?	✓			
Were the retention time windows established for all homologues?	✓			
Was the chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomers ≤ 25% ?	✓			
Is the static resolving power at least 10,000 (10% valley definition)?	✓			
Was the mass resolution adequately check with PFK?	✓			
Was the presence of 1,2,8,9-TCDD and 1,3,4,6,8-PeCDF verified?	✓			
IIIa. Initial calibration				
Was the initial calibration performed at 5 concentration levels?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20% for unlabeled compounds and ≤ 35% for unlabeled compounds?	✓			
Did all calibration standards meet the Ion Abundance Ratio criteria?	✓			
Was the signal to noise ratio for each target compound and labeled compound ≥ 10?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all concentrations for the unlabeled compounds and for labeled compounds within QC limits?	✓			
IV. Continuing calibration				
Was a continuing calibration performed at the beginning and end of each 12 hour period?	✓			
Were all concentrations for the unlabeled compounds and for labeled compounds within QC limits?		✓		
Did all continuing calibration standards meet the Ion Abundance Ratio criteria?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank performed for each matrix and whenever a sample extraction was performed?	✓			
Was there contamination in the method blanks?	✓			
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?	✓			
VII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?			✓	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	

Validation Area	Yes	No	NA	Findings/Comments
VIII. Laboratory control samples				
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
X. Labeled Compounds				
Were labeled compounds within the ~~25-150%~~ QC limits criteria?		✓		
Was the minimum S/N ratio of all labeled compound peaks ≥ 10?	✓			
XI. Compound quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XII. Target compound identification				
For 2,3,7,8 substituted congeners with associated labeled standards, were the retention times of the two quantitation peaks within -1 to 3 sec. of the RT of the labeled standard?	✓			
For 2,3,7,8 substituted congeners without associated labeled standards, were the relative retention times of the two quantitation peaks within 0.005 time units of the RRT measured in the routine calibration?	✓			
For non-2,3,7,8 substituted congeners, were the retention times of the two quantitation peaks within RT established in the performance check solution?	✓			
Did compound spectra contain all characteristic ions listed in the table attached?	✓			
Was the Ion Abundance Ratio for the two quantitation ions within criteria?	✓			
Was the signal to noise ratio for each target compound ≥2.5 and ≥10 for the labeled compound?	✓			
Does the maximum intensity of each specified characteristic ion coincide within ± 2 seconds (includes labeled standards)?	✓			
For PCDF identification, was any signal (S/N ≥ 2.5, at ± seconds RT) detected in the corresponding PCDPE channel?	✓			
Was an acceptable lock mass recorded and monitored?	✓			
XIII. System performance				
System performance was found to be acceptable.	✓			
XIV. Overall assessment of data	✓			
Overall assessment of data was found to be acceptable.				

LDC #: 57827 AZ1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: FT

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration performed at the beginning of each 12 hour period?

Y N N/A Were all the amount for unlabeled and labeled analytes with QC limits?

Y N N/A Did all continuing calibration standards meet the Ion Abundance Ratio criteria?

#	Date	Standard ID	Compound	Finding %D (Limit: QC limit)	Finding Ion Abundance Ratio	Associated Samples	Qualifications
	10/3/23 0033	SLJ0028-CCV1	13C-1,2,3,4,6,7,8-HpCDD	80 ng/ml (85-115)	118 ng/ml (85-115)	9 → 17, 19, 20 #7	J/UJ/P qual D & T all Det

LDC #: 57827A2J

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: FT

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a method blank?

Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?

Y N N/A Was the method blank contaminated?

Blank extraction date: 8/9/23 **Blank analysis date:** 10/19/23 **Associated samples:** all water

Conc. units: pg/L

Compound	Blank ID	5X	Sample Identification						
	BLH02	34-BLK2	18						
G	194	970	82.0 U						

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 57827A21

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: FT

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
Y N N/A Was the method blank contaminated?

Blank extraction date: 8/15/23 **Blank analysis date:** 10/2/23 **Associated samples:** All soils 7 5X
Conc. units: ~~ng/Kg~~ ng/Kg

Compound	Blank ID	Sample Identification								
	BL H03	47-BLK1								
G	0.839	4.195								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 57827A21 **VALIDATION FINDINGS WORKSHEET** Page: 1 of 1
Field Blanks Reviewer: FT

METHOD: HRGC/HRMS (EPA Method 163B)

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds detected in the field blanks?

Sample: 14 = RB Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units (pg/L)
G	82.0

LDC#:57827A21 **VALIDATION FINDINGS WORKSHEET** Page:_1__of_1__
Field Duplicates Reviewer:__FT____

METHOD: (EPA Method 1613B)

Compound	Concentration (ng/kg)		RPD
	3	5	
H	2.09	2.29	9
A	0.408	0.413	1
I	0.953	0.812	16
J	1.01	0.931	8
B	1.37	1.34	2
K	1.69	1.48	13
L	1.63	1.35	19
M	2.59	2.27	13
N	0.711	0.627	13
C	1.39	1.57	12
D	15.8	15.9	1
E	7.22	7.19	0
O	34.0	34.4	1
P	1.78	1.54	14
F	146	153	5
Q	46.1	45.4	2
G	839	818	3
V	19.6	20.2	3
R	18.6	31.0	50
W	21.0	19.3	8
S	14.6	16.6	13
X	51.8	45.7	13
T	113	114	1
Y	92.3	92.0	0
U	305	318	4

LDC#: 57827A21

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: F7

METHOD: EPA Method 1613B

Compound	Concentration (ng/kg)		RPD
	16	17	
H	1.23	1.27	9
A	0.278	0.349	23
I	0.409	0.426	4
J	0.503	0.445	12
B	0.728	0.712	2
K	0.644	0.666	3
L	0.559	0.700	22
M	0.910	0.806	12
N	0.219	0.265	19
C	0.738	0.700	5
D	4.73	3.90	19
E	2.71	2.35	14
O	10.9	10.6	3
P	0.632	0.623	1
F	56.1	50.0	11
Q	17.3	18.6	7
G	368	366	1
V	8.13	6.37	24
R	14.2	16.5	15
W	5.58	4.13	30
S	7.40	8.34	12
X	17.5	13.7	24
T	46.3	36.8	23
Y	29.3	27.7	6
U	150	126	17

LDC #: 57827A21

VALIDATION FINDINGS WORKSHEET

~~Internal~~ Standards
Labeled

Page: 1 of 1
Reviewer: FT

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

X (N) N/A Are all internal standard recoveries were within the QC criteria?
Y (N) N/A Was the S/N ratio all internal standard peaks ≥ 10?

#	Date	Lab ID/Reference	Internal Standard	% Recovery	(Limit:)	Qualifications
		BLH0234-BLK2	13C-F	142 ng/ml	(~~23-140~~ ng/ml)	Jdet /p
					( )	
					(72 - 138 ng/ml)	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
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					( )	
					( )	
					( )	
					( )	

LDC #: 57827A21

VALIDATION FINDINGS WORKSHEET
Target Analyte Quantitation and Reported CRQLs

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

(23)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the compound?
Y N N/A Compound quantitation and CRQLs were adjusted to reflect all sample dilutions and dry weight factors (if necessary).

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		All soils	all analytes qualified as "EMPC" by the lab		J det /A

Comments: See sample calculation verification worksheet for recalculations

LDC #: 57827A21

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: KJ

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs,

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard
X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported RRF (CS3 std) 10/50/100	Recalculated RRF (CS3 std)	Reported %RSD	Recalculated %RSD
1	ICAL	081123	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.9031472	0.9031472	0.8956648	0.8956648	1.2	1.2
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.242982	1.242982	1.171298	1.171298	3.8	3.8
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	0.8826935	0.8826935	0.9220737	0.9220737	4.4	4.4
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	1.199603	1.199603	1.184304	1.184304	12.2	12.2
			OCDF (^{13}C-OCDD)	1.130205	1.130205	1.104526	1.104526	12.7	12.7
2			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)						
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)						
			OCDF (^{13}C-OCDD)						
3			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)						
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)						
			OCDF (^{13}C-OCDD)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 57827A21

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = $(A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	True amount	Reported Amount (CC)	Recalculated Amount (CC)	Reported %D	Recalculated %D
1	SLJ0028	10/2/23	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	10.0	10.7	10.7	7.0	7.0
	1CV1	1322	2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	10.0	9.87	9.87	1.3	1.3
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	50.0	52.7	52.7	5.3	5.3
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	50.0	43.6	43.6	12.7	12.7
			OCDF (^{13}C-OCDD)	100	112	112	11.7	11.7
2	SLJ0028	10/3/23	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	10.0	9.69	9.69	3.1	3.1
	CCV1	0033	2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	10.0	9.51	9.51	4.9	4.9
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	50.0	52.6	52.6	5.3	5.3
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	50.0	46.1	46.1	7.9	7.9
			OCDF (^{13}C-OCDD)	100	102	102	1.9	1.9
3			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)					
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)					
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)					
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)					
			OCDF (^{13}C-OCDD)					

Comments: Refer to Routine Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 57827 A21

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: FT

METHOD: GC/MS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration
SA = Spike added

RPD = I LCS - LCSD I * 2/(LCS + LCSD) LCS = Laboraotry control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS ID: BLH0347-LCS

Compound	Spike Added (ng/kg)		Spiked Sample Concentration (ng/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalc
2,3,7,8-TCDD	20	NA	20.1	NA	100	100				
1,2,3,7,8-PeCDD	100		96.1		96.1	96.1				
1,2,3,4,7,8-HxCDD	100		95.6		95.6	95.6				
1,2,3,4,7,8,9-HpCDF	100		118		118	118				
OCDF	200		224		112	112	NA			

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 57827 A21 **VALIDATION FINDINGS WORKSHEET** Page: 1 of 1
Sample Calculation Verification Reviewer: FT

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

RRF = Relative Response Factor (average) from the initial calibration

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

Example:

Sample I.D. #1 , OCDF :

Conc. = $\frac{(1.879 \times 10^5 + 2.108 \times 10^5)(200)(20)}{(5.575 \times 10^5 + 6.076 \times 10^5)(1.130205)(19.78)(0.89)}$

=

120.6 ng/kg

#	Sample ID	Compound	Reported Concentration (ng/kg)	Calculated Concentration (ng/kg)	Qualification
	#1	OCDF	121	120.6	

LDC Report# 57827B2b

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: December 13, 2023

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0397

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-PDI-092-SG-0-1-20230814	23H0397-01	Soil	08/14/23
JW-PDI-091-SG-0-1-20230814	23H0397-03	Soil	08/14/23
JW-PDI-090-SG-0-1-20230814	23H0397-05	Soil	08/14/23
JW-PDI-109-SG-0-1-20230814	23H0397-09	Soil	08/14/23
JW-PDI-109-SG-0-1-20230814DL	23H0397-09DL	Soil	08/14/23
JW-PDI-116-SG-0-1-20230814	23H0397-11	Soil	08/14/23
JW-PDI-116-SG-0-1-20230814DL	23H0397-11DL	Soil	08/14/23

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270E in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check was performed at the required frequency.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For analytes where average relative response factors (RRFs) were utilized, percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the analytes, all coefficients of determination (r^2) were greater than or equal to 0.990.

Average relative response factors (RRF) for all analytes were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all analytes.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all analytes with the following exceptions:

Date	Analyte	%D	Associated Samples	Flag	A or P
09/29/23	Benzo(k)fluoranthene	21.2	JW-PDI-092-SG-0-1-20230814 JW-PDI-091-SG-0-1-20230814 JW-PDI-090-SG-0-1-20230814 JW-PDI-109-SG-0-1-20230814 JW-PDI-116-SG-0-1-20230814	J (all detects)	A
09/30/23	Acenaphthylene Benzo(b)fluoranthene	23.6 28.4	JW-PDI-109-SG-0-1-20230814DL JW-PDI-116-SG-0-1-20230814DL	J (all detects) J (all detects)	A

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Analyte	Concentration (ug/Kg)	Associated Samples
BLH0560-BLK1	08/22/23	Naphthalene	095	All samples in SDG 23H0397
		2-Methylnaphthalene	0.19	
		Acenaphthene	0.10	
		Phenanthrene	0.18	
		Fluoranthene	0.11	
		Pyrene	0.10	
		Chrysene	0.09	
		Benzo(b)fluoranthene	0.09	

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Target Analyte Quantitation

All target analyte quantitations met validation criteria with the following exceptions:

Sample	Analyte	Finding	Criteria	Flag	A or P
JW-PDI-109-SG-0-1-20230814	Phenanthrene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(j)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Benzo(g,h,i)perylene	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A
JW-PDI-116-SG-0-1-20230814	Fluoranthene Pyrene Chrysene	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects)	A

Raw data were not reviewed for Stage 2B validation.

XIII. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

In the case where more than one result was reported for an individual sample, the least technically acceptable results were deemed not reportable as follows:

Sample	Analyte	Reason	Flag	A or P
JW-PDI-109-SG-0-1-20230814	Phenanthrene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(j)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Benzo(g,h,i)perylene	Results exceeded calibration range.	Not reportable	-

Sample	Analyte	Reason	Flag	A or P
JW-PDI-109-SG-0-1-20230814DL	All analytes except Phenanthrene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(j)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Benzo(g,h,i)perylene	Results from undiluted analyses were more usable.	Not reportable	-
JW-PDI-116-SG-0-1-20230814	Fluoranthene Pyrene Chrysene	Results exceeded calibration range.	Not reportable	-
JW-PDI-116-SG-0-1-20230814DL	All analytes except Fluoranthene Pyrene Chrysene	Results from undiluted analyses were more usable.	Not reportable	-

Data qualified due to continuing calibration %D are summarized and presented in the Data Qualification Summary.

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Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 23H0397

Sample	Analyte	Flag	A or P	Reason (Code)
JW-PDI-092-SG-0-1-20230814 JW-PDI-091-SG-0-1-20230814 JW-PDI-090-SG-0-1-20230814 JW-PDI-109-SG-0-1-20230814 JW-PDI-116-SG-0-1-20230814	Benzo(k)fluoranthene	J (all detects)	A	Continuing calibration (%D) (5)
JW-PDI-109-SG-0-1-20230814DL JW-PDI-116-SG-0-1-20230814DL	Acenaphthylene Benzo(b)fluoranthene	J (all detects) J (all detects)	A	Continuing calibration (%D) (5)
JW-PDI-109-SG-0-1-20230814	Phenanthrene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(j)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Benzo(g,h,i)perylene	Not reportable	-	Overall assessment of data (22)
JW-PDI-109-SG-0-1-20230814DL	All analytes except Phenanthrene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(j)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Benzo(g,h,i)perylene	Not reportable	-	Overall assessment of data (22)
JW-PDI-116-SG-0-1-20230814	Fluoranthene Pyrene Chrysene	Not reportable	-	Overall assessment of data (22)
JW-PDI-116-SG-0-1-20230814DL	All analytes except Fluoranthene Pyrene Chrysene	Not reportable	-	Overall assessment of data (22)

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Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 23H0397

No Sample Data Qualified in this SDG

LDC #: 57827B2b

SDG #: 23H0397

Laboratory: Analytical Resources, Inc., Tukwila, WA

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

Date: 12/7/23

Page: 1 of 1

Reviewer: EM

2nd Reviewer: AK

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW-846 Method 8270E-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	%RSD ≤ 20, r² ICV ≤ 30
IV.	Continuing calibration	SW	CCV ≤ 20
V.	Laboratory Blanks	SW	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Target analyte quantitation	SW	
XIII.	Target analyte identification	N	
XIV.	Overall assessment of data	SW	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	JW-PDI-092-SG-0-1-20230814	23H0397-01	Soil	08/14/23
2	JW-PDI-091-SG-0-1-20230814	23H0397-03	Soil	08/14/23
3	JW-PDI-090-SG-0-1-20230814	23H0397-05	Soil	08/14/23
4	JW-PDI-109-SG-0-1-20230814	23H0397-09	Soil	08/14/23
5	JW-PDI-109-SG-0-1-20230814DL	23H0397-09DL	Soil	08/14/23
6	JW-PDI-116-SG-0-1-20230814	23H0397-11	Soil	08/14/23
7	JW-PDI-116-SG-0-1-20230814DL	23H0397-11DL	Soil	08/14/23
8				
9				
10				

Notes:

	BLH0960-BLK1						

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	CC. Dimethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	GGGG. C30-Hopane	I1. Methyl methanesulfonate
B. Bis (2-chloroethyl) ether	DD. Acenaphthylene	FFF. Di-n-octylphthalate	HHHH. 1-Methylphenanthrene	J1. Ethyl methanesulfonate
C. 2-Chlorophenol	EE. 2,6-Dinitrotoluene	GGG. Benzo(b)fluoranthene	IIII. 1,4-Dioxane	K1. o,o',o"-Triethylphosphorothioate
D. 1,3-Dichlorobenzene	FF. 3-Nitroaniline	HHH. Benzo(k)fluoranthene	JJJJ. Acetophenone	L1. n-Phenylene diamine
E. 1,4-Dichlorobenzene	GG. Acenaphthene	III. Benzo(a)pyrene	KKKK. Atrazine	M1. 1,4-Naphthoquinone
F. 1,2-Dichlorobenzene	HH. 2,4-Dinitrophenol	JJJ. Indeno(1,2,3-cd)pyrene	LLLL. Benzaldehyde	N1. N-Nitro-o-toluidine
G. 2-Methylphenol	II. 4-Nitrophenol	KKK. Dibenz(a,h)anthracene	MMMM. Caprolactam	O1. 1,3,5-Trinitrobenzene
H. 2,2'-Oxybis(1-chloropropane)	JJ. Dibenzofuran	LLL. Benzo(g,h,i)perylene	NNNN. 2,6-Dichlorophenol	P1. Pentachlorobenzene
I. 4-Methylphenol	KK. 2,4-Dinitrotoluene	MMM. Bis(2-Chloroisopropyl)ether	OOOO. 1,2-Diphenylhydrazine	Q1. 4-Aminobiphenyl
J. N-Nitroso-di-n-propylamine	LL. Diethylphthalate	NNN. Aniline	PPPP. 3-Methylphenol	R1. 2-Naphthylamine
K. Hexachloroethane	MM. 4-Chlorophenyl-phenyl ether	OOO. N-Nitrosodimethylamine	QQQQ. 3&4-Methylphenol	S1. Triphenylene
L. Nitrobenzene	NN. Fluorene	PPP. Benzoic Acid	RRRR. 4-Dimethyldibenzothiophene (4MDT)	T1. Octachlorostyrene
M. Isophorone	OO. 4-Nitroaniline	QQQ. Benzyl alcohol	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	U1. Famphur
N. 2-Nitrophenol	PP. 4,6-Dinitro-2-methylphenol	RRR. Pyridine	TTTT. 1-Methyldibenzothiophene (1MDT)	V1. 1,4-phenylenediamine
O. 2,4-Dimethylphenol	QQ. N-Nitrosodiphenylamine	SSS. Benzidine	UUUU.. 2,3,4,6-Tetrachlorophenol	W1. Methapyrilene
P. Bis(2-chloroethoxy)methane	RR. 4-Bromophenyl-phenylether	TTT. 1-Methylnaphthalene	VVVV. 1,2,4,5-Tetrachlorobenzene	X1. Pentachloroethane
Q. 2,4-Dichlorophenol	SS. Hexachlorobenzene	UUU.Benzo(b)thiophene	WWWW.. 2-Picoline	Y1. 3,3'-Dimethylbenzidine
R. 1,2,4-Trichlorobenzene	TT. Pentachlorophenol	VVV.Benzonaphthothiophene	XXXX. 3-Methylcholanthrene	Z1. o-Toluidine
S. Naphthalene	UU. Phenanthrene	WWW.Benzo(e)pyrene	YYYY. a,a-Dimethylphenethylamine	A2. 1-Naphthylamine
T. 4-Chloroaniline	VV. Anthracene	XXX. 2,6-Dimethylnaphthalene	ZZZZ. Hexachloropropene	B2. 4-Aminobiphenyl
U. Hexachlorobutadiene	WW. Carbazole	YYY. 2,3,5-Trimethylnaphthalene	A1. N-Nitrosodiethylamine	C2. 4-Nitroquinoline-1-oxide
V. 4-Chloro-3-methylphenol	XX. Di-n-butylphthalate	ZZZ. Perylene	B1. N-Nitrosodi-n-butylamine	D2. Hexachloropene
W. 2-Methylnaphthalene	YY. Fluoranthene	AAAA. Dibenzothiophene	C1. N-Nitrosomethylethylamine	E2. Bis (2-chloro-1-methylethyl) ether
X. Hexachlorocyclopentadiene	ZZ. Pyrene	BBBB. Benzo(a)fluoranthene	D1. N-Nitrosomorpholine	F2. Bifenthrin
Y. 2,4,6-Trichlorophenol	AAA. Butylbenzylphthalate	CCCC. Benzo(b)fluorene	E1. N-Nitrosopyrrolidine	G2. Cyfluthrin
Z. 2,4,5-Trichlorophenol	BBB. 3,3'-Dichlorobenzidine	DDDD. cis/trans-Decalin	F1. Phenacetin	H2. Cypermethrin
AA. 2-Chloronaphthalene	CCC. Benzo(a)anthracene	EEEE. 1,1'-Biphenyl	G1. 2-Acetylaminofluorene	I2. Permethrin (cis/trans)
BB. 2-Nitroaniline	DDD. Chrysene	FFFF. Retene	H1. Pronamide	J2. 5-Nitro-o-toluidine

LDC #: 57827B2b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270 E)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument?

Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?

Y N N/A Were all %D and RRFs within the validation criteria of ≤20%D and ≥0.05 RRF ?

(5)

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	9/29/23 1216	SLI0466 - ICV1	HHH	21.2		1→4, 6, BLH0560-BLK1	Idet/A all Det
158	9/30/23 0827	SLI0483 - ICV1	DD	23.6		5, 7 ↓	Idet/A all Det
			GGG	28.4			

LDC #: 57827 B2b

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270 E)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

(7)

Blank extraction date: 8/22/23 **Blank analysis date:** 9/29/23
Conc. units: ug/kg Associated Samples: All (>5X)

Compound	Blank ID	5X							
	BLH0560-	BLK1							
S	0.95	4.75							
W	0.19	0.95							
GG	0.10	0.5							
UU	0.18	0.9							
YY	0.11	0.55							
ZZ	0.10	0.50							
DDD	0.09	0.45							

Blank extraction date: ↓ **Blank analysis date:** ↓
Conc. units: ug/kg Associated Samples: All (>5X

Compound	Blank ID								
	↓	X							
GGG	0.09	0.45							

LDC #: 57827B2b

VALIDATION FINDINGS WORKSHEET
Target Analyte Quantitation

METHOD: SVOA GCMS 8270

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results? (20)

#	Associated Samples	Compound Name	Findings	Qualifications
9	4	uu, YY, ZZ, ccc, DDD, GGG, HHH, *, III, JJJ, LLL	x'd cal Range	J dw A
11	6	YY, ZZ, DDD	↓	↓
	* Benzo(j)fluoranthene,			

Comments: See sample calculation verification worksheet for recalculations

LDC #: 57827B2b

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270 E)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

Y N N/A Was the overall quality and usability of the data acceptable? (ZZ)

#	Sample ID	Compound	Finding	Qualifications
	4	UU, YY, ZZ, CCC, DDD, GGG, HHH, *, III, JJJ, LLL	x'ol cal Range	NR/Δ
	5	all except above	diluted	NR/Δ
	6	YY, ZZ, DDD	x'd cal Range	NR/Δ
	7	all except above	diluted	NR/Δ

Comments: _____

LDC Report# 57827B3b

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: December 14, 2023

Parameters: Polychlorinated Biphenyls

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0397

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-PDI-092-SG-0-1-20230814	23H0397-01	Soil	08/14/23
JW-PDI-091-SG-0-1-20230814	23H0397-03	Soil	08/14/23
JW-PDI-090-SG-0-1-20230814	23H0397-05	Soil	08/14/23
JW-PDI-116-SG-0-1-20230814	23H0397-11	Soil	08/14/23
JW-PDI-090-SG-0-1-20230814MS	23H0397-05MS	Soil	08/14/23
JW-PDI-090-SG-0-1-20230814MSD	23H0397-05MSD	Soil	08/14/23

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

NJ (Presumptive and estimated): The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all analytes.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all analytes.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all analytes.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Surrogates/Internal Standards

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

All internal standard areas and retention times were within QC limits with the following exceptions:

Sample	Internal Standards	Area (623180-2492720)	Affected Analyte	Flag	A or P
JW-PDI-092-SG-0-1-20230814	Hexachlorobiphenyl	581146	Aroclor-1260 Aroclor-1262 Aroclor-1268	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (50-150)	MSD (%R) (50-150)	Affected Analyte	Flag	A or P
JW-PDI-090-SG-0-1-20230814MS/MSD (JW-PDI-090-SG-0-1-20230814)	Aroclor-1016 Aroclor-1260	32.5 31.3	- -	All analytes	J (all detects) UJ (all non-detects)	A

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	RPD (≤35)	Affected Analyte	Flag	A or P
JW-PDI-090-SG-0-1-20230814MS/MSD (JW-PDI-090-SG-0-1-20230814)	Aroclor-1016 Aroclor-1260	77.8 84.1	All analytes except Aroclor-1248 Aroclor-1254	NA	-
JW-PDI-090-SG-0-1-20230814MS/MSD (JW-PDI-090-SG-0-1-20230814)	Aroclor-1016 Aroclor-1260	77.8 84.1	Aroclor-1248 Aroclor-1254	J (all detects) J (all detects)	A

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Target Analyte Quantitation

The sample results for detected analytes from the two columns were within 40% relative percent difference (RPD) with the following exceptions:

Sample	Analyte	RPD	Flag	A or P
JW-PDI-090-SG-0-1-20230814	Aroclor-1254	73.8	J (all detects)	A

Sample	Analyte	Finding	Criteria	Flag	A or P
JW-PDI-091-SG-0-1-20230814	Aroclor-1260	2nd column confirmation was not performed for this analyte.	2nd column confirmation should be performed for all detected results.	NJ (all detects)	A

Raw data were not reviewed for Stage 2B validation.

XI. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Data qualified due to internal standard area, MS/MSD %R and RPD, RPD between two columns, and 2nd column confirmation are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polychlorinated Biphenyls - Data Qualification Summary - SDG 23H0397

Sample	Analyte	Flag	A or P	Reason (Code)
JW-PDI-092-SG-0-1-20230814	Aroclor-1260 Aroclor-1262 Aroclor-1268	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P	Internal standards (Area) (19)
JW-PDI-090-SG-0-1-20230814	All analytes	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R) (8)
JW-PDI-090-SG-0-1-20230814	Aroclor-1248 Aroclor-1254	J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (RPD) (9)
JW-PDI-090-SG-0-1-20230814	Aroclor-1254	J (all detects)	A	Target analyte quantitation (RPD between two columns) (12)
JW-PDI-091-SG-0-1-20230814	Aroclor-1260	NJ (all detects)	A	Target analyte quantitation (2nd column confirmation) (12)

Jeld-Wen
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG 23H0397

No Sample Data Qualified in this SDG

LDC #: 57827B3b
SDG #: 23H0397
Laboratory: Analytical Resources, Inc., Tukwila, WA

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 12/7/23
Page: 1 of 1
Reviewer: A
2nd Reviewer:

METHOD: GC Polychlorinated Biphenyls (EPA SW-846 Method 8082A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	%RSD ≤ 20 ICV ≤ 20
III.	Continuing calibration	A	CCV ≤ 20
IV.	Laboratory Blanks	A	
V.	Field blanks	N	
VI.	Surrogate spikes 1/5	A SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Target analyte quantitation	SW	
XI.	Target analyte identification	N	
XII.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	JW-PDI-092-SG-0-1-20230814	23H0397-01	Soil	08/14/23
2	JW-PDI-091-SG-0-1-20230814	23H0397-03	Soil	08/14/23
3	JW-PDI-090-SG-0-1-20230814	23H0397-05	Soil	08/14/23
4	JW-PDI-116-SG-0-1-20230814	23H0397-11	Soil	08/14/23
5	JW-PDI-090-SG-0-1-20230814MS	23H0397-05MS	Soil	08/14/23
6	JW-PDI-090-SG-0-1-20230814MSD	23H0397-05MSD	Soil	08/14/23
7				
8				
9				
10				
11				
12				
13				

Notes:

	BLH0464-BLK1						

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG. Chlordane
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH. Chlordane (Technical)
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II. Aroclor 1262
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ. Aroclor 1268
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. 2,4'-DDD	KK. Oxychlordane
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. 2,4'-DDE	LL. trans-Nonachlor
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE. 2,4'-DDT	MM. cis-Nonachlor
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF. Hexachlorobenzene	NN.

Notes:_____

LDC #: 57827B3b

VALIDATION FINDINGS WORKSHEET
Internal Standards

Reviewer: FT

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082A)

(19)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all internal standard area counts within -50 to +100 of the associated calibration standard?

Y N N/A Were the retention times of the internal standards within +/- 30 seconds of the retention times of the associated calibration standard?

#	Sample ID	Internal Standard	Column	Area (Limits)	RT (Limits)	Qualifications
	#1	**	col 1	581146 (623180-2492720)		J/UJ/P all ND qual BB, Aroclor 1262, Aroclor 1268,
				** Hexachlorobiphenyl		

BNB = 1-Bromo-2-nitrobenzene
HBB = Hexabromobiphenyl

LDC #: 57827B3b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: FT

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?

[✓ Y] N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

% R = 8

% RPD = 9

#	MS/MSD ID	Compound	MS %Recovery	MSD %Recovery	MS/MSD %Recovery Limits	RPD (Limits)	Associated Samples	Qualifications
	5 + 6	Y	32.5		50-150	( )	3	J/UJ/A all TCL
		BB	31.3		50-150	( )	↓	↓ ↓
		✓				77.8 (35)		Jdets/A
		BB				84.1 (↓)	↓	↓ ↓
						( )		Z, AA are detect
						( )		
						( )		
						( )		
						( )		
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						( )		
						( )		
						( )		
						( )		
						( )		

LDC #: 57827B3D

VALIDATION FINDINGS WORKSHEET
Target Analyte Quantitation

Reviewer: FT

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results? (12)

#	Associated Samples	Compound Name	Findings % RPD Bet 2 col ≤ 40	Qualifications
	3	AA	73.8	J (all) / A
	2	BB	~~no~~ result not confirmed on 2nd column	NJ

Comments: See sample calculation verification worksheet for recalculations

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: November 16, 2023

Parameters: Wet Chemistry

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA/
Materials Testing & Consulting, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0397/23B014-19

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-PDI-092-SG-0-1-20230814	23H0397-01/B23-0941	Soil	08/14/23
JW-PDI-091-SG-0-1-20230814	23H0397-03/B23-0944	Soil	08/14/23
JW-PDI-090-SG-0-1-20230814	23H0397-05/B23-0945	Soil	08/14/23
JW-PDI-104-SG-0-1-20230814	23H0397-06/B23-0946	Soil	08/14/23
JW-PDI-103-SG-0-1-20230814	23H0397-08/B23-0947	Soil	08/14/23
JW-PDI-109-SG-0-1-20230814	23H0397-09/B23-0948	Soil	08/14/23
JW-PDI-105-SG-0-1-20230814	23H0397-10/B23-0949	Soil	08/14/23
JW-PDI-116-SG-0-1-20230814	23H0397-11/B23-0950	Soil	08/14/23
JW-PDI-106-SG-0-1-20230814	23H0397-13/B23-0951	Soil	08/14/23
JW-PDI-092-SG-0-1-20230814DUP	23H0397-01/B23-0942DUP	Soil	08/14/23
JW-PDI-092-SG-0-1-20230814TRP	23H0397-01/B23-0943TRP	Soil	08/14/23

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Moisture Content by American Society for Testing and Material (ASTM) C556 and ASTM D2216
Organic Matter by ASTM D2974
Total Solids by ASTM D2216

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the methods.

VII. Triplicate Sample Analysis

Triplicate (TRP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were not required by the methods.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Target Analyte Quantitation

Raw data were not reviewed for Stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Jeld-Wen
Wet Chemistry - Data Qualification Summary - SDG 23H0397/23B014-19

No Sample Data Qualified in this SDG

Jeld-Wen
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 23H0397/23B014-19

No Sample Data Qualified in this SDG

LDC #: 57827B6 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/15/23
SDG #: 23H0397/23B014-19 Stage 2B Page: 1 of 1
Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer: NF
Sub-Laboratory: Materials Testing & Consulting, Inc., Tukwila, WA 2nd Reviewer: AC

METHOD: (Analyte) Moisture Content (ASTM C556/ASTM D2216), Organic Matter (ASTM D2974), Total Solids (ASTM D2216)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	N	
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	N	
IX.	Field duplicates	N	
X.	Target Analyte Quantitation	N	
XI.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank

	Client ID	Sub-Lab ID	Lab ID	Matrix	Date
1	JW-PDI-092-SG-0-1-20230814	B23-0941	23H0397-01	Soil	08/14/23
2	JW-PDI-091-SG-0-1-20230814	B23-0944	23H0397-03	Soil	08/14/23
3	JW-PDI-090-SG-0-1-20230814	B23-0945	23H0397-05	Soil	08/14/23
4	JW-PDI-104-SG-0-1-20230814	B23-0946	23H0397-06	Soil	08/14/23
5	JW-PDI-103-SG-0-1-20230814	B23-0947	23H0397-08	Soil	08/14/23
6	JW-PDI-109-SG-0-1-20230814	B23-0948	23H0397-09	Soil	08/14/23
7	JW-PDI-105-SG-0-1-20230814	B23-0949	23H0397-10	Soil	08/14/23
8	JW-PDI-116-SG-0-1-20230814	B23-0950	23H0397-11	Soil	08/14/23
9	JW-PDI-106-SG-0-1-20230814	B23-0951	23H0397-13	Soil	08/14/23
10	JW-PDI-092-SG-0-1-20230814DUP	B23-0942	23H0397-01DUP	Soil	08/14/23
11	JW-PDI-092-SG-0-1-20230814TRP	B23-0943	23H0397-01TRP	Soil	08/14/23
12					
13					
14					
15					

Notes:

All elements are applicable to each sample as noted below.

Sample ID	Target Analyte List
1-9	Moisture Content, Organic Matter
1-3, 6, 8	Total Solids
QC	
10-11	Moisture Content, Organic Matter

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: December 14, 2023

Parameters: Polychlorinated Dioxins/Dibenzofurans

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0397

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-PDI-092-SG-0-1-20230814	23H0397-01	Soil	08/14/23
JW-PDI-079-SG-0-1-20230814	23H0397-02	Soil	08/14/23
JW-PDI-091-SG-0-1-20230814	23H0397-03	Soil	08/14/23
JW-PDI-080-SG-0-1-20230814	23H0397-04	Soil	08/14/23
JW-PDI-090-SG-0-1-20230814	23H0397-05	Soil	08/14/23
JW-PDI-078-SG-0-1-20230814	23H0397-07	Soil	08/14/23
JW-PDI-116-SG-0-1-20230814	23H0397-11	Soil	08/14/23
JW-PDI-081-SG-0-1-20230814	23H0397-12	Soil	08/14/23
JW-PDI-092-SG-0-1-20230814DUP	23H0397-01DUP	Soil	08/14/23

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for High Resolution Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Dioxins/Dibenzofurans by Environmental Protection Agency (EPA) Method 1613B

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25%.

The static resolving power was at least 10,000 (10% valley definition).

III. Initial Calibration and Initial Calibration Verification

A five point initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all analytes and less than or equal to 35.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were within the QC limits for all analytes and labeled compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration results were within the QC limits for all analytes and labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Analyte	Concentration (ng/Kg)	Associated Samples
BLH0545-BLK2	08/23/23	1,2,3,4,6,7,8-HpCDD OCDF OCDD	1.48 1.94 16.1	All samples in SDG 23H0397

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates/Duplicate Sample Analysis

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Labeled Compounds

All percent recoveries (%R) for labeled compounds used to quantitate target analytes were within QC limits.

XI. Target Analyte Quantitation

All target analyte quantitations were within validation criteria with the following exceptions:

Sample	Analyte	Flag	A or P
All samples in SDG 23H0397	All analytes reported by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A

Raw data were not reviewed for Stage 2B validation.

XII. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Data qualified due to results reported by the laboratory as EMPCs are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Data Qualification Summary - SDG 23H0397

Sample	Analyte	Flag	A or P	Reason (Code)
JW-PDI-092-SG-0-1-20230814 JW-PDI-079-SG-0-1-20230814 JW-PDI-091-SG-0-1-20230814 JW-PDI-080-SG-0-1-20230814 JW-PDI-090-SG-0-1-20230814 JW-PDI-078-SG-0-1-20230814 JW-PDI-116-SG-0-1-20230814 JW-PDI-081-SG-0-1-20230814	All analytes reported by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A	Target analyte quantitation (EMPC) (23)

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG 23H0397

No Sample Data Qualified in this SDG

LDC #: 57827B21 **VALIDATION COMPLETENESS WORKSHEET** Date: 2/7/23
SDG #: 23H0397 Stage 2B Page: 1 of 1
Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer: FT
2nd Reviewer: [illegible]

METHOD: HRGC/HRMS Polychlorinated Dioxins/Dibenzofurans (EPA Method 1613B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	%RSD ≤ 20/35 ICV = ac limits
IV.	Continuing calibration	A	CCV = ac limits
V.	Laboratory Blanks	SW	
VI.	Field blanks	N	
VII.	Matrix spike/Matrix spike duplicates DUP	N/A	c>
VIII.	Laboratory control samples	A	LC>
IX.	Field duplicates	N	~~RPD = 1,9~~ FT
X.	Labeled Compounds	A	
XI.	Target analyte quantitation	SW	
XII.	Target analyte identification	N	
XIII.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	JW-PDI-092-SG-0-1-20230814 D	23H0397-01	Soil	08/14/23
2	JW-PDI-079-SG-0-1-20230814	23H0397-02	Soil	08/14/23
3	JW-PDI-091-SG-0-1-20230814	23H0397-03	Soil	08/14/23
4	JW-PDI-080-SG-0-1-20230814	23H0397-04	Soil	08/14/23
5	JW-PDI-090-SG-0-1-20230814	23H0397-05	Soil	08/14/23
6	JW-PDI-078-SG-0-1-20230814	23H0397-07	Soil	08/14/23
7	JW-PDI-116-SG-0-1-20230814	23H0397-11	Soil	08/14/23
8	JW-PDI-081-SG-0-1-20230814	23H0397-12	Soil	08/14/23
9	JW-PDI-092-SG-0-1-20230814DUP D	23H0397-01DUP	Soil	08/14/23
10				
11				

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method ~~8290~~) 1613B

A. 2,3,7,8-TCDD	F. 1,2,3,4,6,7,8-HpCDD	K. 1,2,3,4,7,8-HxCDF	P. 1,2,3,4,7,8,9-HpCDF	U. Total HpCDD
B. 1,2,3,7,8-PeCDD	G. OCDD	L. 1,2,3,6,7,8-HxCDF	Q. OCDF	V. Total TCDF
C. 1,2,3,4,7,8-HxCDD	H. 2,3,7,8-TCDF	M. 2,3,4,6,7,8-HxCDF	R. Total TCDD	W. Total PeCDF
D. 1,2,3,6,7,8-HxCDD	I. 1,2,3,7,8-PeCDF	N. 1,2,3,7,8,9-HxCDF	S. Total PeCDD	X. Total HxCDF
E. 1,2,3,7,8,9-HxCDD	J. 2,3,4,7,8-PeCDF	O. 1,2,3,4,6,7,8-HpCDF	T. Total HxCDD	Y. Total HpCDF

Notes:_____

LDC #: 57827B21

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: FT

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were all samples associated with a method blank?

(Y) N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?

(Y) N N/A Was the method blank contaminated?

Blank extraction date: 8/23/22 **Blank analysis date:** 10/19/23 **Associated samples:** All 7 5X

Conc. units: ng/Kg

Compound	Blank ID	5X Sample Identification								
	BLH0525-BLK2									
F	1.48	7.4								
Q	1.94	9.7								
G	16.1	80.5								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 57827B21

VALIDATION FINDINGS WORKSHEET
Target Analytes Quantitation and Reported CRQLs

Reviewer: F7

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method ~~8290~~) 1613B

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N (N/A) Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the compound?
Y N (N/A) Compound quantitation and CRQLs were adjusted to reflect all sample dilutions and dry weight factors (if necessary).

(23)

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		All	all analytes qualified as "EMPC" by the laboratory		J(w)/A

Comments: See sample calculation verification worksheet for recalculations

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Anchor QEA, LLC
1201 Third Ave. Suite 2600
Seattle, WA 98101
ATTN: Ms. Delaney Peterson
dpeterson@anchorqea.com

January 17, 2024

SUBJECT: Jeld-Wen - Data Validation

Dear Ms. Peterson,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on October 31, 2023. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #57832:

SDG #	**Fraction**
23H0413/23B014-21 23H0444 23H0501	Polynuclear Aromatic Hydrocarbons, Polychlorinated Biphenyls, Wet Chemistry, Polychlorinated Dioxins/Dibenzofurans, Volatiles, Metals

The data validation was performed under Stage 2B & 4 guidelines. The analysis was validated using the following documents, as applicable to each method:

- Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023)
- USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020)
- USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (November 2020)
- USEPA National Functional Guidelines (NFG) for High Resolution Superfund Methods Data Review (November 2020)
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Stella Cuenco
scuenco@lab-data.com
Project Manager/Senior Chemist

45 pages-ADV R1 (added B-C) Attachment 1

Stage 2B (PCB & Diox 90/10) EDD **LDC# 57832 (Anchor Environmental-Seattle WA / Jeld-Wen)**

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (8260D)		PAHs (8270E -SIM)		PCBs (8082A)		Metals (6010D /7471B)		Dioxins (1613B)		Moist. Content (D2216)		Org. Matter (D2974)		Total Solids (D2216)																	
Matrix:	Water/Soil-Sediment			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	23H0413/ 23B014-21	10/26/23	11/17/23	-	-	2	2	4	1	-	-	2	7	0	7	0	7	0	4																
A	23H0413/ 23B014-21	10/26/23	11/17/23	-	-	0	0	0	1	-	-	0	1	0	0	0	0	0	0																
B	23H0444	11/16/23	12/11/23	-	-	1	14	1	6	-	-	1	11	0	10	0	10	0	6																
C	23H0501	10/31/23	11/21/23	0	2	1	14	0	6	0	2	1	6	0	9	0	9	0	6																
C	23H0501	10/31/23	11/21/23	0	0	0	0	0	1	0	0	0	2	0	0	0	0	0	0																
Total	TR/SC			0	2	4	30	5	15	0	2	4	27	0	26	0	26	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	157

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS, MSD, or DUP's.

V:\LOGIN\Anchor\Jeld Wen\57832ST.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: December 12, 2023

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0413

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-PDI-093-SG-0-1-20230814	23H0413-01	Soil	08/14/23
JW-RB-04-20230815	23H0413-02	Water	08/15/23
JW-PDI-057-SG-0-1-20230815	23H0413-04	Soil	08/15/23
JW-RB-05-20230815	23H0413-07	Water	08/15/23

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270E in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check was performed at the required frequency.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For analytes where average relative response factors (RRFs) were utilized, percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the analytes, all coefficients of determination (r^2) were greater than or equal to 0.990.

Average relative response factors (RRF) for all analytes were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all analytes.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all analytes with the following exceptions:

Date	Analyte	%D	Associated Samples	Flag	A or P
09/29/23	Benzo(k)fluoranthene	21.2	All soil samples in SDG 23H0413	J (all detects)	A

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Analyte	Concentration (ug/Kg)	Associated Samples
BLH0560-BLK1	08/22/23	Naphthalene 2-Methylnaphthalene Acenaphthene Phenanthrene Fluoranthene Pyrene Chrysene Benzo(b)fluoranthene	0.95 0.19 0.10 0.18 0.11 0.10 0.09 0.09	All soil samples in SDG 23H0413

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration (ug/Kg)	Modified Final Concentration (ug/Kg)
JW-PDI-057-SG-0-1-20230815	Naphthalene Acenaphthene	3.12 0.49	3.12J 0.50U

Although the concentration was within the action level (≤ 5X blank contaminants) for the sample JW-PDI-057-SG-0-1-20230815, using professional judgment, this result was qualified as estimated (J) since the concentration detected in the associated method blank was uncharacteristically high for a method blank.

VI. Field Blanks

Samples JW-RB-04-20230815 and JW-RB-05-20230815 were identified as rinse blanks. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration (ug/L)
JW-RB-04-20230815	Naphthalene Phenanthrene	0.006 0.030
JW-RB-05-20230815	Naphthalene Phenanthrene	0.006 0.019

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Target Analyte Quantitation

Raw data were not reviewed for Stage 2B validation.

XIII. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Data qualified due to continuing calibration %D and laboratory blank contamination are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 23H0413

Sample	Analyte	Flag	A or P	Reason (Code)
JW-PDI-093-SG-0-1-20230814 JW-PDI-057-SG-0-1-20230815	Benzo(k)fluoranthene	J (all detects)	A	Continuing calibration (%D) (5)

Jeld-Wen
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 23H0413

Sample	Analyte	Modified Final Concentration (ug/Kg)	A or P	Code
JW-PDI-057-SG-0-1-20230815	Naphthalene Acenaphthene	3.12J 0.50U	A	7

LDC #: 57832A2b

SDG #: 23H0413

Laboratory: Analytical Resources, Inc., Tukwila, WA

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

Date: 12/7/23

Page: 1 of 1

Reviewer: EH

2nd Reviewer: A

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW-846 Method 8270E-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A /A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	%D/RSD ≤ 20, r² ICV ≤ 30
IV.	Continuing calibration	SW	CCV ≤ 20
V.	Laboratory Blanks	SW	
VI.	Field blanks	SW	RB = 2 4
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Target analyte quantitation	N	
XIII.	Target analyte identification	N	
XIV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1 1	JW-PDI-093-SG-0-1-20230814	23H0413-01	Soil	08/14/23
2 2	JW-RB-04-20230815	23H0413-02	Water	08/15/23
3 1	JW-PDI-057-SG-0-1-20230815	23H0413-04	Soil	08/15/23
4 2	JW-RB-05-20230815	23H0413-07	Water	08/15/23
5				
6				
7				
8				
9				
10				

Notes:

+ 1	BLH0560							
− 2	BLH0494							

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	CC. Dimethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	GGGG. C30-Hopane	I1. Methyl methanesulfonate
B. Bis (2-chloroethyl) ether	DD. Acenaphthylene	FFF. Di-n-octylphthalate	HHHH. 1-Methylphenanthrene	J1. Ethyl methanesulfonate
C. 2-Chlorophenol	EE. 2,6-Dinitrotoluene	GGG. Benzo(b)fluoranthene	IIII. 1,4-Dioxane	K1. o,o',o"-Triethylphosphorothioate
D. 1,3-Dichlorobenzene	FF. 3-Nitroaniline	HHH. Benzo(k)fluoranthene	JJJJ. Acetophenone	L1. n-Phenylene diamine
E. 1,4-Dichlorobenzene	GG. Acenaphthene	III. Benzo(a)pyrene	KKKK. Atrazine	M1. 1,4-Naphthoquinone
F. 1,2-Dichlorobenzene	HH. 2,4-Dinitrophenol	JJJ. Indeno(1,2,3-cd)pyrene	LLLL. Benzaldehyde	N1. N-Nitro-o-toluidine
G. 2-Methylphenol	II. 4-Nitrophenol	KKK. Dibenz(a,h)anthracene	MMMM. Caprolactam	O1. 1,3,5-Trinitrobenzene
H. 2,2'-Oxybis(1-chloropropane)	JJ. Dibenzofuran	LLL. Benzo(g,h,i)perylene	NNNN. 2,6-Dichlorophenol	P1. Pentachlorobenzene
I. 4-Methylphenol	KK. 2,4-Dinitrotoluene	MMM. Bis(2-Chloroisopropyl)ether	OOOO. 1,2-Diphenylhydrazine	Q1. 4-Aminobiphenyl
J. N-Nitroso-di-n-propylamine	LL. Diethylphthalate	NNN. Aniline	PPPP. 3-Methylphenol	R1. 2-Naphthylamine
K. Hexachloroethane	MM. 4-Chlorophenyl-phenyl ether	OOO. N-Nitrosodimethylamine	QQQQ. 3&4-Methylphenol	S1. Triphenylene
L. Nitrobenzene	NN. Fluorene	PPP. Benzoic Acid	RRRR. 4-Dimethyldibenzothiophene (4MDT)	T1. Octachlorostyrene
M. Isophorone	OO. 4-Nitroaniline	QQQ. Benzyl alcohol	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	U1. Famphur
N. 2-Nitrophenol	PP. 4,6-Dinitro-2-methylphenol	RRR. Pyridine	TTTT. 1-Methyldibenzothiophene (1MDT)	V1. 1,4-phenylenediamine
O. 2,4-Dimethylphenol	QQ. N-Nitrosodiphenylamine	SSS. Benzidine	UUUU.. 2,3,4,6-Tetrachlorophenol	W1. Methapyrilene
P. Bis(2-chloroethoxy)methane	RR. 4-Bromophenyl-phenylether	TTT. 1-Methylnaphthalene	VVVV. 1,2,4,5-Tetrachlorobenzene	X1. Pentachloroethane
Q. 2,4-Dichlorophenol	SS. Hexachlorobenzene	UUU.Benzo(b)thiophene	WWWW.. 2-Picoline	Y1. 3,3'-Dimethylbenzidine
R. 1,2,4-Trichlorobenzene	TT. Pentachlorophenol	VVV.Benzonaphthothiophene	XXXX. 3-Methylcholanthrene	Z1. o-Toluidine
S. Naphthalene	UU. Phenanthrene	WWW.Benzo(e)pyrene	YYYY. a,a-Dimethylphenethylamine	A2. 1-Naphthylamine
T. 4-Chloroaniline	VV. Anthracene	XXX. 2,6-Dimethylnaphthalene	ZZZZ. Hexachloropropene	B2. 4-Aminobiphenyl
U. Hexachlorobutadiene	WW. Carbazole	YYY. 2,3,5-Trimethylnaphthalene	A1. N-Nitrosodiethylamine	C2. 4-Nitroquinoline-1-oxide
V. 4-Chloro-3-methylphenol	XX. Di-n-butylphthalate	ZZZ. Perylene	B1. N-Nitrosodi-n-butylamine	D2. Hexachloropene
W. 2-Methylnaphthalene	YY. Fluoranthene	AAAA. Dibenzothiophene	C1. N-Nitrosomethylethylamine	E2. Bis (2-chloro-1-methylethyl) ether
X. Hexachlorocyclopentadiene	ZZ. Pyrene	BBBB. Benzo(a)fluoranthene	D1. N-Nitrosomorpholine	F2. Bifenthrin
Y. 2,4,6-Trichlorophenol	AAA. Butylbenzylphthalate	CCCC. Benzo(b)fluorene	E1. N-Nitrosopyrrolidine	G2. Cyfluthrin
Z. 2,4,5-Trichlorophenol	BBB. 3,3'-Dichlorobenzidine	DDDD. cis/trans-Decalin	F1. Phenacetin	H2. Cypermethrin
AA. 2-Chloronaphthalene	CCC. Benzo(a)anthracene	EEEE. 1,1'-Biphenyl	G1. 2-Acetylaminofluorene	I2. Permethrin (cis/trans)
BB. 2-Nitroaniline	DDD. Chrysene	FFFF. Retene	H1. Pronamide	J2. 5-Nitro-o-toluidine

LDC #: 57832A2b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270 E)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument?

Y (N) N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?

Y (N) N/A Were all %D and RRFs within the validation criteria of ≤20%D and ≥0.05 RRF ?

(5)

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20.0%)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
	9/29/23 12:16	SLI 0466 -ICV1	HHH	21.2		All soil	J(+)/A all Dt

LDC #: 57832A2b

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270 E)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

(7)

Blank extraction date: 8/22/23 **Blank analysis date:** 9/29/23
Conc. units: ug/kg Associated Samples: All SOILS

Compound	Blank ID								
	BLH0560-BLK1			3					
S	0.95	4.75		3.12 J					
W	0.19	0.95		-					
GG	0.10	0.5		0.49 / 0.50U					
UU	0.18	0.9		-					
YY	0.11	0.55		-					
ZZ	0.10	0.50		-					
DDD	0.09	0.45		-					

Blank extraction date: ↓ **Blank analysis date:** ↓
Conc. units: ↓ Associated Samples: All SOIL

Compound	Blank ID								
	↓			3					
GGG	0.09	0.45		-					

LDC #: 57832A26

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: FT

METHOD: GC/MS PAH (EPA SW 846 Method 8270E)

(Y) N N/A Were field blanks identified in this SDG?
(Y) N N/A Were target compounds detected in the field blanks?

(6)

Sample: #2=RB Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units (ug/L)
S	0.006
UU	0.030

Sample: #4 = RB Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units (ug/L)
S	0.006
UU	0.019

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ( )

LDC Report# 57832A3b

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: December 12, 2023

Parameters: Polychlorinated Biphenyls

Validation Level: Stage 2B & 4

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0413

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-PDI-093-SG-0-1-20230814	23H0413-01	Soil	08/14/23
JW-RB-04-20230815	23H0413-02	Water	08/15/23
JW-RB-04-20230815RE	23H0413-02RE	Water	08/15/23
JW-PDI-057-SG-0-1-20230815**	23H0413-04**	Soil	08/15/23
JW-RB-05-20230815	23H0413-07	Water	08/15/23
JW-RB-05-20230815RE	23H0413-07RE	Water	08/15/23

**Indicates sample underwent Stage 4 validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Stage 4 data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all analytes.

Retention time windows were established as required by the method for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all analytes.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all analytes with the following exceptions:

Date	Standard	Column	Analyte	%D	Associated Samples	Affected Analyte	Flag	A or P
10/16/23	SLJ0128-CCV8	Col 1	Aroclor-1260	29.8	JW-RB-04-20230815RE JW-RB-05-20230815RE	Aroclor-1254 Aroclor-1260 Aroclor 1262 Aroclor 1268	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A

Retention times of all analytes in the calibration standards were within the established retention time windows for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Samples JW-RB-04-20230815, JW-RB-04-20230815RE, JW-RB-05-20230815, and JW-RB-05-20230815RE were identified as field blanks. No contaminants were found.

VI. Surrogates/Internal Standards

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

All internal standard areas and retention times were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Analyte	LCS %R (60-140)	LCSD %R (60-140)	Affected Analyte	Flag	A or P
BLH0492-LCS/LCSD (JW-RB-04-20230815 JW-RB-05-20230815)	Aroclor-1016 Aroclor-1260	42.1 47.5	18.0 22.9	All analytes	UJ (all non-detects)	P

Relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Analyte	RPD (≤30)	Flag	A or P
BLH0492-LCS/LCSD (JW-RB-04-20230815 JW-RB-05-20230815)	Aroclor-1016 Aroclor-1260	80.1 70.0	NA	-

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Target Analyte Quantitation

All target analyte quantitation met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XI. Target Analyte Identification

All target analyte identifications met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

In the case where more than one result was reported for an individual sample, the least technically acceptable results were deemed not reportable as follows:

Sample	Analyte	Reason	Flag	A or P
JW-RB-04-20230815 JW-RB-05-20230815	All Analytes	Low LCS/LCSD recoveries.	Not reportable	A

Data qualified due to continuing calibration %D are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polychlorinated Biphenyls - Data Qualification Summary - SDG 23H0413

Sample	Analyte	Flag	A or P	Reason (Code)
JW-RB-04-20230815RE JW-RB-05-20230815RE	Aroclor-1254 Aroclor-1260 Aroclor 1262 Aroclor 1268	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A	Continuing calibration (%D) (5)
JW-RB-04-20230815 JW-RB-05-20230815	All Analytes	Not reportable	A	Overall assessment of data (22)

Jeld-Wen
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG 23H0413

No Sample Data Qualified in this SDG

LDC #: 57832A3b

SDG #: 23H0413

Laboratory: Analytical Resources, Inc., Tukwila, WA

VALIDATION COMPLETENESS WORKSHEET

Stage 2B/4

Date: 12/7/23

Page: 1 of 1

Reviewer:

2nd Reviewer:

METHOD: GC Polychlorinated Biphenyls (EPA SW-846 Method 8082A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	%D RSD/ ICV ≤ 20
III.	Continuing calibration	SW/A	CCV ≤ 20
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	RB = 2, 3, 5, 6
VI.	Surrogate spikes (1S)	SW/A	
VII.	Matrix spike/Matrix spike duplicates	N	CS
VIII.	Laboratory control samples	SW	LCS/P
IX.	Field duplicates	N	
X.	Target analyte quantitation	A	Not reviewed for Stage 2B validation.
XI.	Target analyte identification	A	Not reviewed for Stage 2B validation.
XII	Overall assessment of data	SW	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Indicates sample underwent Stage 4 validation

	Client ID	Lab ID	Matrix	Date
1 (1)	JW-PDI-093-SG-0-1-20230814	23H0413-01	Soil	08/14/23
2 (2)	JW-RB-04-20230815	23H0413-02	Water	08/15/23
3 (3)	JW-RB-04-20230815RE	23H0413-02RE	Water	08/15/23
4 (1)	JW-PDI-057-SG-0-1-20230815**	23H0413-04**	Soil	08/15/23
5 (2)	JW-RB-05-20230815	23H0413-07	Water	08/15/23
6 (3)	JW-RB-05-20230815RE	23H0413-07RE	Water	08/15/23
7				
8				
9				
10				
11				
12				
13				

Notes:

1	BLH0559						
2	BLH0492						
3	BLI0466						

LDC #: 57432A36 **VALIDATION FINDINGS CHECKLIST** Page: 1 of 2
Reviewer: FT

Method: ✓ GC ___ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
IIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥0.990?			✓	
Were the RT windows properly established?	✓			
IIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20%?		✓		
Were all the retention times within the acceptance windows?	✓			
IV. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks?		✓		
V. Field Blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VI. Surrogate spikes				
Were all surrogate percent recovery (%R) within the QC limits?		✓		
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?		✓	NA ✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?			✓	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
VIII. Laboratory control samples				
Was an LCS analyzed per analytical or extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		✓		
IX. Field duplicates				

Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
X. Compound quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG. Chlordane
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH. Chlordane (Technical)
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II. Aroclor 1262
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ. Aroclor 1268
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. 2,4'-DDD	KK. Oxychlordane
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. 2,4'-DDE	LL. trans-Nonachlor
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE. 2,4'-DDT	MM. cis-Nonachlor
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF. Hexachlorobenzene	NN.

Notes:_____

LDC #: 57832A3b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 7
Reviewer: FT

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
What type of continuing calibration calculation was performed? ___%D or ___%R
Y N N/A Were continuing calibration standards analyzed at the required frequencies?
Y N N/A Did the continuing calibration standards meet the %D / %R validation criteria of ≤20.0% / 80-120%?
Level IV Only
Y N N/A Were the retention times for all calibrated compounds within their respective acceptance windows? (5)

#	Date	Standard ID	Detector/ Column	Compound	%D (Limit ≤ 20.0)	RT (limit)	Associated Samples	Qualifications
	10/16/23	SLJ0128-	col 1	BB	29.8		3, 6	J/UJ/A all ND
	14:23	CCV8						qual AA, BB,
								Aroclor ~~1260~~, 1262
								Aroclor 1268
			note	cal 1248 was analyzed Before sample (passed)				

LDC #: 57832 A3b

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

Reviewer: FT

METHOD: ✓ GC ___ HPLC

Are surrogates required by the method? Yes____ or No____.

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were surrogates spiked into all samples and blanks?

Y (N) N/A Did all surrogate recoveries (%R) meet the QC limits?

(13)

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	BLH0492-BLK1	col 1	Y	34.7 (39-120)	J/UJ/P
		col 2	Y	33.0 (39-120)	↓
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C`	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	Chloro-octadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-Dichlorophenylacetic acid
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate	CC	2,5-Dibromotoluene
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 57832A3b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: FT

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y [✓ N] N/A Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?

Level IV/D Only

[✓ Y] N N/A Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

(10)

LCS/LCSD ID	Compound	LCS % Recovery	LCSD % Recovery	LCS/LCSD %Recovery limits	RPD (Limits)	Associated Samples	Qualifications
BLH0492-	V	42.1	18.0	60-140	( )	2, 5,	J/UJ/P all ND
LCS1D	BB	47.5	22.9	↓	( )	BLH0492-BLK1	↓
	Y				80.1 (30)		Jdet/P
	BB				70.0 (↓)		↓
					( )		qual all analytes
					( )		
					( )		
					( )		
					( )		
					( )		
					( )		
					( )		
					( )		
					( )		
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					( )		
					( )		
					( )		
					( )		
					( )		
					( )		

LDC #: 57832A3b

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Reviewer: FT

METHOD: √ **GC** __ **HPLC**

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

Y N N/A Was the overall quality and usability of the data acceptable?

(22)

#	Associated samples	Analytes	Findings	Qualifications
	2, 5	All	low LCS ID recovery and outside % RPD	NR/A

Comments: _____

LDC #: 57832A3b

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT

METHOD: GC PCB (EPA SW 846 Method 8082)

The calibration factors (CF) and relative standard deviation (%RSD) were recalculated using the following calculations:

CF = A/C
Average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

Where: A = Area of compound
C = Concentration of compound
S = Standard deviation of calibration factors
X = Mean of calibration factors

#	Standard ID	Calibration Date	Compound	Reported RRF (250 ug/Ll std)	Recalculated RRF (250 ug/L std)	Reported Ave RRF(initial)	Recalculated Ave RRF(intial)	Reported %RSD	Recalculated %RSD
1	ICAL	08/19/23	PCB 1260-1 ZB5	4.235272e-2	4.2657719e-2	4.192872e-2	4.192872e-2	5.9	5.9
	GH0059		PCB 1260-1 ZB35	4.358216e-2	4.3896e-2	4.473978e-2	4.473978e-2	7.8	7.8
2									
3									
4									

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 57832 A3b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT

METHOD: GC ✓ HPLC _____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF -CF)/ave.CF

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(ICAL)/ CCV Conc.	Reported CF/ Conc. CCV	Recalculated CF/ Conc. CCV	Reported %D	Recalculated %D
1	SL I0133 1CV2	9/11/13 1114	1260-1 col 1	250.0	235	235	6.0	6.0
			1260-1 col 2	↓	260	260	4.0	4.0
2								
3								
4								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 57832A3b

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: FT

METHOD: ✓ GC __ HPLC

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 4

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
DCB	col 1	40.0	33.1	82.7	82.7	0
TCMX	1		28.1	70.2	70.2	
DCB	col 2	↓	36.2	90.5	90.5	↓
TCMX	2	↓	27.6	69.0	69.0	↓

Sample ID: _____

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C`	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	Chloro-octadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-Dichlorophenylacetic acid
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate	CC	2,5-Dibromotoluene
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 57832A3b

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: FT

METHOD: ✓ GC ___HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC/SA)
RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100

Where SSC = Spiked sample concentration; LCS = Laboratory Control Sample; SA = Spike added; LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples: BLH0559 LCS1D

Compound	Spike Added (ug/kg)		Spike Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Aroclor 1260	500	500	421	~~384~~ F7 414	84.2	84.2	~~76.1~~ 82.9	82.9	1.55	1.55

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 57832A3b

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: FT

METHOD: ✓ GC ___ HPLC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration= $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound in the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. #4 Compound Name Aroclor 1254

Concentration = $\frac{17.676\ (5)}{(6.71)(0.7520)}$ =

= 17.515 ng/kg

#	Sample ID	Compound	Reported Concentrations (ug/kg)	Recalculated Results Concentrations (ug/kg)	Qualifications
	#4	Aroclor 1254	17.5	17.515	
	1254-1 = (4199)(80) / (391147)(4.776252 x 10^-2)			1254-1 = 17.98	
				2 = 17.8	
				3 = 15.8	
		= 17.98		4 = 16.6	
				5 = 20.2	
				17.676	

Comments: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: January 16, 2024

Parameters: Wet Chemistry

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA/
Materials Testing & Consulting, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0413/23B014-21

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-PDI-093-SG-0-1-20230814	23H0413-01/B23-0932	Soil	08/14/23
JW-PDI-062-SG-0-1-20230815	23H0413-03/B23-0935	Soil	08/15/23
JW-PDI-057-SG-0-1-20230815	23H0413-04/B23-0936	Soil	08/15/23
JW-PDI-063-SG-0-1-20230815	23H0413-05/B23-0937	Soil	08/15/23
JW-PDI-023-SG-0-1-20230815	23H0413-09/B23-0938	Soil	08/15/23
JW-PDI-024-SG-0-1-20230815	23H0413-10/B23-0939	Soil	08/15/23
JW-PDI-065-SG-0-1-20230815	23H0413-16/B23-0940	Soil	08/15/23
JW-PDI-093-SG-0-1-20230814DUP	23H0413-01DUP/B23-0933	Soil	08/14/23
JW-PDI-093-SG-0-1-20230814TRP	23H0413-01TRP/B23-0934	Soil	08/14/23

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Moisture Content by American Society for Testing and Material (ASTM) C556 and ASTM D2216
Organic Matter by ASTM D2974
Total Solids by ASTM D2216

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Less than reporting limit
25 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

Initial calibration analysis was not required by the methods.

III. Continuing Calibration

Continuing calibration frequency and analysis was not required by the methods.

IV. Laboratory Blanks

Laboratory blank analysis was not required by the methods.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the methods.

VII. Triplicate Sample Analysis

Triplicate (TRP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were not required by the methods.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Target Analyte Quantitation

Raw data were not reviewed for Stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Jeld-Wen
Wet Chemistry - Data Qualification Summary - SDG 23H0413/23B014-21

No Sample Data Qualified in this SDG

Jeld-Wen
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 23H0413/23B014-21

No Sample Data Qualified in this SDG

LDC #: 57832A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/20/23
SDG #: 23H0413/23B014-21 Stage 2B Page: 1 of 1
Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer: NF
Sub-Laboratory: Materials Testing & Consulting, Inc., Tukwila, WA 2nd Reviewer: TC

METHOD: (Analyte) Moisture Content (ASTM C556/ASTM D2216), Organic Matter (ASTM D2974), Total Solids (ASTM D2216)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II	Initial calibration	N	
III.	Calibration verification	N	
IV	Laboratory Blanks	N	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	N	
VII.	Duplicate sample analysis /TRP	~~SW~~ A	
VIII.	Laboratory control samples	N	
IX.	Field duplicates	N	
X.	Target Analyte Quantitation	N	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Sub-Lab ID	Lab ID	Matrix	Date
1	JW-PDI-093-SG-0-1-20230814	B23-0932	23H0413-01	Soil	08/14/23
2	JW-PDI-062-SG-0-1-20230815	B23-0935	23H0413-03	Soil	08/15/23
3	JW-PDI-057-SG-0-1-20230815	B23-0936	23H0413-04	Soil	08/15/23
4	JW-PDI-063-SG-0-1-20230815	B23-0937	23H0413-05	Soil	08/15/23
5	JW-PDI-023-SG-0-1-20230815	B23-0938	23H0413-09	Soil	08/15/23
6	JW-PDI-024-SG-0-1-20230815	B23-0939	23H0413-10	Soil	08/15/23
7	JW-PDI-065-SG-0-1-20230815	B23-0940	23H0413-16	Soil	08/15/23
8	JW-PDI-093-SG-0-1-20230814DUP	B23-0933	23H0413-01DUP	Soil	08/14/23
9	JW-PDI-093-SG-0-1-20230814TRP	B23-0934	23H0413-01TRP	Soil	08/14/23
10					
11					
12					
13					
14					
15					

Notes:

All elements are applicable to each sample as noted below.

Sample ID	Target Analyte List
1-7	Moisture Content, Organic Matter
1, 3, 5-6	Total Solids
QC	
8-9	Moisture Content, Organic Matter

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: December 12, 2023

Parameters: Polychlorinated Dioxins/Dibenzofurans

Validation Level: Stage 2B & 4

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0413

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-PDI-093-SG-0-1-20230814	23H0413-01	Soil	08/14/23
JW-RB-04-20230815	23H0413-02	Water	08/15/23
JW-PDI-057-SG-0-1-20230815**	23H0413-04**	Soil	08/15/23
JW-PDI-044-SG-0-1-20230815	23H0413-06	Soil	08/15/23
JW-RB-05-20230815	23H0413-07	Water	08/15/23
JW-PDI-023-SG-0-1-20230815	23H0413-09	Soil	08/15/23
JW-PDI-024-SG-0-1-20230815	23H0413-10	Soil	08/15/23
JW-PDI-005-SG-0-1-20230815	23H0413-12	Soil	08/15/23
JW-PDI-004-SG-0-1-20230815	23H0413-13	Soil	08/15/23
JW-PDI-003-SG-0-1-20230815	23H0413-14	Soil	08/15/23

**Indicates sample underwent Stage 4 validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for High Resolution Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Dioxins/Dibenzofurans by Environmental Protection Agency (EPA) Method 1613B

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Stage 4 data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25%.

The static resolving power was at least 10,000 (10% valley definition).

III. Initial Calibration and Initial Calibration Verification

A five point initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all analytes and less than or equal to 35.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The minimum S/N ratio was greater than or equal to 10 for each analyte and labeled compound associated to samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

The percent differences (%D) of the initial calibration verification (ICV) standard were within the QC limits for all analytes and labeled compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration results were within the QC limits for all analytes and labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The minimum S/N ratio was greater than or equal to 10 for each analyte and labeled compound associated to samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Analyte	Concentration	Associated Samples
BLH0631-BLK	08/24/23	OCDF OCDD	5.53 pg/L 27.6 pg/L	All water samples in SDG 23H0413
BLH0545-BLK1	08/23/23	1,2,3,4,6,7,8-HpCDD OCDF OCDD	1.48 ug/Kg 1.94 ug/Kg 16.1 ug/Kg	All soil samples in SDG 23H0413

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration (pg/L)	Modified Final Concentration (pg/L)
JW-RB-04-20230815	OCDF OCDD	11.4 122	11.4U 122U
JW-RB-05-20230815	OCDF OCDD	3.94 48.6	3.94U 48.6U

VI. Field Blanks

Samples JW-RB-04-20230815 and JW-RB-05-20230815 were identified as rinse blanks. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration (pg/L)
JW-RB-04-20230815	1,2,3,4,6,7,8-HpCDD OCDF OCDD	11.7 11.4 122
JW-RB-05-20230815	1,2,3,4,6,7,8-HpCDD OCDF OCDD	5.59 3.94 48.6

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Labeled Compounds

All percent recoveries (%R) for labeled compounds used to quantitate target analytes were within QC limits.

XI. Target Analyte Quantitation

All target analyte quantitations were within validation criteria with the following exceptions:

Sample	Analyte	Flag	A or P
All samples in SDG 23H0413	All analytes reported by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A

Raw data were not reviewed for Stage 2B validation.

XII. Target Analyte Identification

All target analyte identifications met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Data qualified due to results reported by the laboratory as EMPCs and laboratory blank contamination are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Data Qualification Summary - SDG 23H0413

Sample	Analyte	Flag	A or P	Reason (Code)
JW-PDI-093-SG-0-1-20230814 JW-RB-04-20230815 JW-PDI-057-SG-0-1-20230815** JW-PDI-044-SG-0-1-20230815 JW-RB-05-20230815 JW-PDI-023-SG-0-1-20230815 JW-PDI-024-SG-0-1-20230815 JW-PDI-005-SG-0-1-20230815 JW-PDI-004-SG-0-1-20230815 JW-PDI-003-SG-0-1-20230815	All analytes reported by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A	Target analyte quantitation (EMPC) (23)

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG 23H0413

Sample	Analyte	Modified Final Concentration (pg/L)	A or P	Code
JW-RB-04-20230815	OCDF OCDD	11.4U 122U	A	7
JW-RB-05-20230815	OCDF OCDD	3.94U 48.6U	A	7

LDC #: 57832A21 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/7/23
SDG #: 23H0413 Stage 2B/4 Page: 1 of 1
Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: HRGC/HRMS Polychlorinated Dioxins/Dibenzofurans (EPA Method 1613B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	%RSD ≤ 20/35 ICV = QC limit
IV.	Continuing calibration	A	CCV = QC limit
V.	Laboratory Blanks	SW	
VI.	Field blanks	SW	RB = 2, 5
VII.	Matrix spike/Matrix spike duplicates	N	CS
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Labeled Compounds	A	
XI.	Target analyte quantitation	SW	Not reviewed for Stage 2B validation.
XII.	Target analyte identification	A	Not reviewed for Stage 2B validation.
XIII.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Stage 4 validation

		Client ID		Lab ID	Matrix	Date
1	1	JW-PDI-093-SG-0-1-20230814		23H0413-01	Soil	08/14/23
2	2	JW-RB-04-20230815	RB	23H0413-02	Water	08/15/23
3	1	JW-PDI-057-SG-0-1-20230815**		23H0413-04**	Soil	08/15/23
4	1	JW-PDI-044-SG-0-1-20230815		23H0413-06	Soil	08/15/23
5	2	JW-RB-05-20230815	RB	23H0413-07	Water	08/15/23
6	1	JW-PDI-023-SG-0-1-20230815		23H0413-09	Soil	08/15/23
7	1	JW-PDI-024-SG-0-1-20230815		23H0413-10	Soil	08/15/23
8	1	JW-PDI-005-SG-0-1-20230815		23H0413-12	Soil	08/15/23
9	1	JW-PDI-004-SG-0-1-20230815		23H0413-13	Soil	08/15/23
10	1	JW-PDI-003-SG-0-1-20230815		23H0413-14	Soil	08/15/23
11						

Notes:

1	BL-H0545-BLK						
2	BL-H0631-BLK						

LDC #: 57832 A21

VALIDATION FINDINGS CHECKLIST

Reviewer: FT

Method: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Was PFK exact mass 380.9760 verified?	✓			
Were the retention time windows established for all homologues?	✓			
Was the chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomers ≤ 25% ?	✓			
Is the static resolving power at least 10,000 (10% valley definition)?	✓			
Was the mass resolution adequately check with PFK?	✓			
Was the presence of 1,2,8,9-TCDD and 1,3,4,6,8-PeCDF verified?	✓			
IIIa. Initial calibration				
Was the initial calibration performed at 5 concentration levels?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20% for unlabeled compounds and ≤ 35% for unlabeled compounds?	✓			
Did all calibration standards meet the Ion Abundance Ratio criteria?	✓			
Was the signal to noise ratio for each target compound and labeled compound ≥ 10?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all concentrations for the unlabeled compounds and for labeled compounds within QC limits?	✓			
IV. Continuing calibration				
Was a continuing calibration performed at the beginning and end of each 12 hour period?	✓			
Were all concentrations for the unlabeled compounds and for labeled compounds within QC limits?	✓			
Did all continuing calibration standards meet the Ion Abundance Ratio criteria?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank performed for each matrix and whenever a sample extraction was performed?	✓			
Was there contamination in the method blanks?	✓			
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?	✓			
VII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?			✓	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	

Validation Area	Yes	No	NA	Findings/Comments
VIII. Laboratory control samples				
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
X. Labeled Compounds				
Were labeled compounds within the 25-150% criteria?	✓			
Was the minimum S/N ratio of all labeled compound peaks ≥ 10?	✓			
XI. Compound quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XII. Target compound identification				
For 2,3,7,8 substituted congeners with associated labeled standards, were the retention times of the two quantitation peaks within -1 to 3 sec. of the RT of the labeled standard?	✓			
For 2,3,7,8 substituted congeners without associated labeled standards, were the relative retention times of the two quantitation peaks within 0.005 time units of the RRT measured in the routine calibration?	✓			
For non-2,3,7,8 substituted congeners, were the retention times of the two quantitation peaks within RT established in the performance check solution?	✓			
Did compound spectra contain all characteristic ions listed in the table attached?	✓			
Was the Ion Abundance Ratio for the two quantitation ions within criteria?	✓			
Was the signal to noise ratio for each target compound ≥2.5 and ≥10 for the labeled compound?	✓			
Does the maximum intensity of each specified characteristic ion coincide within ± 2 seconds (includes labeled standards)?	✓			
For PCDF identification, was any signal (S/N ≥ 2.5, at ± seconds RT) detected in the corresponding PCDPE channel?	✓			
Was an acceptable lock mass recorded and monitored?	✓			
XIII. System performance				
System performance was found to be acceptable.	✓			
XIV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

A. 2,3,7,8-TCDD	F. 1,2,3,4,6,7,8-HpCDD	K. 1,2,3,4,7,8-HxCDF	P. 1,2,3,4,7,8,9-HpCDF	U. Total HpCDD
B. 1,2,3,7,8-PeCDD	G. OCDD	L. 1,2,3,6,7,8-HxCDF	Q. OCDF	V. Total TCDF
C. 1,2,3,4,7,8-HxCDD	H. 2,3,7,8-TCDF	M. 2,3,4,6,7,8-HxCDF	R. Total TCDD	W. Total PeCDF
D. 1,2,3,6,7,8-HxCDD	I. 1,2,3,7,8-PeCDF	N. 1,2,3,7,8,9-HxCDF	S. Total PeCDD	X. Total HxCDF
E. 1,2,3,7,8,9-HxCDD	J. 2,3,4,7,8-PeCDF	O. 1,2,3,4,6,7,8-HpCDF	T. Total HxCDD	Y. Total HpCDF

Notes:_____

LDC #: 57832A21

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: FT

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

(7)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a method blank?

Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?

Y N N/A Was the method blank contaminated?

Blank extraction date: 8/24/23 **Blank analysis date:** 10/20/23 **Associated samples:** all water

Conc. units: pg/L

Compound	Blank ID	5X		Sample Identification						
	BLH0631-BLK			2	5					
9	5.53	27.65		11.4U	3.94U					
6	27.6	138		122U	48.6U					

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 57832A21

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: FT

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(7)

Y N N/A Were all samples associated with a method blank?

Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?

Y N N/A Was the method blank contaminated?

Blank extraction date: 8/23/23 **Blank analysis date:** 10/19/23 **Associated samples:** all soils 7SX

Conc. units: ng/kg

Compound	Blank ID	5X	Sample Identification							
	BLH0545-BLK1									
F	1.48	7.4								
Q	1.94	9.7								
G	16.1	80.5								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 57832A21 **VALIDATION FINDINGS WORKSHEET**
Field Blanks

Page: 1 of 1
Reviewer: F7

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds detected in the field blanks?

Sample: #2 RB Field Blank / Rinsate Blank/ Equipment Blank / Rinsate (circle one)

Compound	Concentration Units (pg/L)
F	11.7
Q	11.4
G	122

Sample: #5 RB Field Blank / Rinsate Blank/ Equipment Blank / Rinsate (circle one)

Compound	Concentration Units (pg/L)
F	5.59
Q	3.94
G	48.6

LDC #: 57832A21

VALIDATION FINDINGS WORKSHEET
Target Analyte Quantitation and Reported CRQLs

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

(23)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the compound?
Y N N/A Compound quantitation and CRQLs were adjusted to reflect all sample dilutions and dry weight factors (if necessary).

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		All	all analytes reported qualified as "EMPC" by the laboratory		J (all) / A

Comments: See sample calculation verification worksheet for recalculations

LDC #: 57832A21

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
$\%RSD = 100 * (S/X)$

A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard
S = Standard deviation of the RRFs, X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported RRF (CS3 std) 10/50/100	Recalculated RRF (CS3 std)	Reported %RSD	Recalculated %RSD
1	ICAL	081123	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.9031472	0.9031472	0.8956648	0.8956648	1.2	1.2
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.242982	1.242982	1.171298	1.171298	3.8	3.8
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	0.8826935	0.8826935	0.9220737	0.9220737	4.4	4.4
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	1.199603	1.199603	1.184304	1.184304	12.2	12.2
			OCDF (^{13}C-OCDD)	1.130205	1.130205	1.104526	1.104526	12.7	12.7
2			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)						
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)						
			OCDF (^{13}C-OCDD)						
3			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)						
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)						
			OCDF (^{13}C-OCDD)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 57832A21

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	True amount	Reported Amount (CC)	Recalculated Amount (CC)	Reported %D	Recalculated %D
1	SLJ0319-CCV1	10/19/23 2339	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	10.0	10.8	10.8	8.4	8.4
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	10.0	9.48	9.48	5.2	5.2
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	50	49.2	49.2	1.6	1.6
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	50	45.7	45.7	8.6	8.6
			OCDF (^{13}C-OCDD)	100	106	106	5.9	5.9
2	SLJ0319-ICV1	10/19/23 1138	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	10.0	10.7	10.7	7.0	7.0
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	10.0	9.70	9.70	3.0	3.0
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	50	47.3	47.3	5.3	5.3
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	50	46.5	46.5	7.0	7.0
			OCDF (^{13}C-OCDD)	100	106	106	5.6	5.6
3			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)					
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)					
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)					
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)					
			OCDF (^{13}C-OCDD)					

Comments: Refer to Routine Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 57832 A21

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

METHOD: GC/MS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration
SA = Spike added

RPD = I LCS - LCSD I * 2/(LCS + LCSD) LCS = Laboraotry control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS ID: BLH0545 - LCS

Compound	Spike Added (ng/Kg)		Spiked Sample Concentration (ng/Kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalc
2,3,7,8-TCDD	20.0	NA	18.6	NA	92.8	92.8				
1,2,3,7,8-PeCDD	100		91.3		91.3	91.3				
1,2,3,4,7,8-HxCDD	↓	↓	86.6	↓	86.6	86.6				
1,2,3,4,7,8,9-HpCDF	↓	↓	111	↓	111	111				
OCDF	200	↓	172	↓	86.1	86.1				

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 57832A21

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: FT

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

RRF = Relative Response Factor (average) from the initial calibration

Df = Dilution Factor. GH00041

%S = Percent solids, applicable to soil and solid matrices only. 20 / 13.13

Example:

Sample I.D. #3 , OCDF :

Conc. = $\frac{(2.489\times10^4 + 2.738\times10^4)(200)(20)(\frac{1}{0.7626})}{(5.859\times10^5 + 6.576\times10^5)(1.130205)(13.13)}$

= 14.86 ng/kg

%S = 76.26

#	Sample ID	Compound	Reported Concentration (ng/kg)	Calculated Concentration (ng/kg)	Qualification
	#3	OCDF	14.9	14.86	

LDC Report# 57832B2b

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: December 14, 2023

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0444

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-PDI-094-SG-0-1-20230816	23H0444-01	Soil	08/16/23
JW-PDI-111-SG-0-1-20230816	23H0444-05	Soil	08/16/23
JW-PDI-110-SG-0-1-20230816	23H0444-06	Soil	08/16/23
JW-PDI-110-SG-0-1-20230816DL	23H0444-06DL	Soil	08/16/23
JW-PDI-095-SG-0-1-20230816	23H0444-08	Soil	08/16/23
JW-PDI-095-SG-0-1-20230816DL	23H0444-08DL	Soil	08/16/23
JW-PDI-112-SG-0-1-20230816	23H0444-09	Soil	08/16/23
JW-PDI-096-SG-0-1-20230816	23H0444-10	Soil	08/16/23
JW-PDI-096-SG-0-1-20230816DL	23H0444-10DL	Soil	08/16/23
JW-PDI-097-SG-0-1-20230816	23H0444-12	Soil	08/16/23
JW-PDI-097-SG-0-1-20230816DL	23H0444-12DL	Soil	08/16/23
JW-RB-06-20230816	23H0444-14	Water	08/16/23
JW-PDI-098-SG-0-1-20230816	23H0444-16	Soil	08/16/23
JW-PDI-098-SG-0-1-20230816DL	23H0444-16DL	Soil	08/16/23
JW-PDI-113-SG-0-1-20230816	23H0444-17	Soil	08/16/23
JW-PDI-094-SG-0-1-20230816MS	23H0444-01MS	Soil	08/16/23
JW-PDI-094-SG-0-1-20230816MSD	23H0444-01MSD	Soil	08/16/23

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270E in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check was performed at the required frequency.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For analytes where average relative response factors (RRFs) were utilized, percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the analytes, all coefficients of determination (r^2) were greater than or equal to 0.990.

Average relative response factors (RRF) for all analytes were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all analytes.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all analytes with the following exceptions:

Date	Analyte	%D	Associated Samples	Flag	A or P
09/23/23	Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene	23.6 27.6	All water samples in SDG 23H0444	UJ (all non-detects) UJ (all non-detects)	A
09/29/23	Benzo(k)fluoranthene	21.2	JW-PDI-094-SG-0-1-20230816 JW-PDI-111-SG-0-1-20230816 JW-PDI-110-SG-0-1-20230816 JW-PDI-095-SG-0-1-20230816 JW-PDI-112-SG-0-1-20230816 JW-PDI-096-SG-0-1-20230816 JW-PDI-097-SG-0-1-20230816 JW-PDI-098-SG-0-1-20230816	J (all detects)	A

Date	Analyte	%D	Associated Samples	Flag	A or P
09/30/23	Acenaphthylene Benzo(b)fluoranthene	23.6 28.4	JW-PDI-110-SG-0-1-20230816DL JW-PDI-095-SG-0-1-20230816DL JW-PDI-096-SG-0-1-20230816DL JW-PDI-097-SG-0-1-20230816DL JW-PDI-098-SG-0-1-20230816DL	J (all detects) J (all detects)	A

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Analyte	Concentration	Associated Samples
BLH0604-BLK1	08/23/23	Carbazole	0.005 ug/L	All water samples in SDG 23H0444
BLH0560-BLK1	08/22/23	Naphthalene 2-Methylnaphthalene Acenaphthene Phenanthrene Fluoranthene Chrysene Benzo(b)fluoranthene Pyrene	0.95 ug/Kg 0.19 ug/Kg 0.10 ug/Kg 0.18 ug/Kg 0.11 ug/Kg 0.09 ug/Kg 0.09 ug/Kg 0.10 ug/Kg	All soil samples in SDG 23H0444

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks.

VI. Field Blanks

Sample JW-RB-06-20230816 was identified as a rinse blank. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration (ug/L)
JW-RB-06-20230816	Naphthalene Phenanthrene Carbazole	0.010 0.035 0.026

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (50-150)	MSD (%R) (50-150)	Flag	A or P
JW-PDI-094-SG-0-1-20230816MS/MSD (JW-PDI-094-SG-0-1-20230816)	Fluoranthene	253	172	J (all detects)	A
	Pyrene	257	161	J (all detects)	
	Benzo(a)anthracene	198	-	J (all detects)	
	Chrysene	238	-	J (all detects)	

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	RPD (≤35)	Flag	A or P
JW-PDI-094-SG-0-1-20230816MS/MSD (JW-PDI-094-SG-0-1-20230816)	Benzo(a)anthracene	37.5	J (all detects)	A
	Chrysene	36.9	J (all detects)	

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Analyte	LCS %R (60-140)	LCSD %R (Limits)	Flag	A or P
BLH0604-LCS/LCSD (All water samples in SDG 23H0444)	Indeno(1,2,3-cd)pyrene	48.4	-	UJ (all non-detects)	P
	Dibenzo(a,h)anthracene	45.6	-	UJ (all non-detects)	
	Benzo(a)pyrene	57.9	-	UJ (all non-detects)	
	Benzo(g,h,i)perylene	53.6	-	UJ (all non-detects)	

Relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Analyte	RPD (≤30)	Flag	A or P
BLH0604-LCS/LCSD (All water samples in SDG 23H0444)	Phenanthrene Carbazole	30.3 34.0	J (all detects) J (all detects)	P
BLH0604-LCS/LCSD (All water samples in SDG 23H0444)	Fluoranthene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(j) fluoranthene Benzo(a)pyrene Perylene Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Benzo(g,h,i)perylene	30.1 32.6 30.6 33.9 33.3 32.1 32.3 34.6 33.0 32.7 32.1	NA	-

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Target Analyte Quantitation

All target analyte quantitation were within validation criteria with the following exceptions:

Sample	Analyte	Reason	Flag	A or P
JW-PDI-110-SG-0-1-20230816 JW-PDI-095-SG-0-1-20230816 JW-PDI-096-SG-0-1-20230816 JW-PDI-098-SG-0-1-20230816	Fluoranthene Pyrene Chrysene	Results exceeded calibration range.	Not reportable	A
JW-PDI-097-SG-0-1-20230816	Chrysene	Results exceeded calibration range.	Not reportable	A

Raw data were not reviewed for Stage 2B validation.

XIII. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

In the case where more than one result was reported for an individual sample, the least technically acceptable results were deemed not reportable as follows:

Sample	Analyte	Reason	Flag	A or P
JW-PDI-110-SG-0-1-20230816 JW-PDI-095-SG-0-1-20230816 JW-PDI-096-SG-0-1-20230816 JW-PDI-098-SG-0-1-20230816	Fluoranthene Pyrene Chrysene	Results exceeded calibration range.	Not reportable	A
JW-PDI-110-SG-0-1-20230816DL JW-PDI-095-SG-0-1-20230816DL JW-PDI-096-SG-0-1-20230816DL JW-PDI-098-SG-0-1-20230816DL	All analytes except Fluoranthene Pyrene Chrysene	Results from undiluted analyses were more usable.	Not reportable	A
JW-PDI-097-SG-0-1-20230816	Chrysene	Results exceeded calibration range.	Not reportable	A
JW-PDI-097-SG-0-1-20230816DL	All analytes except Chrysene	Results from undiluted analyses were more usable.	Not reportable	A

Data qualified due to continuing calibration %D, MS/MSD %R and RPD, and LCS/LCSD %R and RPD are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 23H0444

Sample	Analyte	Flag	A or P	Reason (Code)
JW-RB-06-20230816	Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene	UJ (all non-detects) UJ (all non-detects)	A	Continuing calibration (%D) (5)
JW-PDI-094-SG-0-1-20230816 JW-PDI-111-SG-0-1-20230816 JW-PDI-110-SG-0-1-20230816 JW-PDI-095-SG-0-1-20230816 JW-PDI-112-SG-0-1-20230816 JW-PDI-096-SG-0-1-20230816 JW-PDI-097-SG-0-1-20230816 JW-PDI-098-SG-0-1-20230816	Benzo(k)fluoranthene	J (all detects)	A	Continuing calibration (%D) (5)
JW-PDI-094-SG-0-1-20230816	Fluoranthene Pyrene Benzo(a)anthracene Chrysene	J (all detects) J (all detects) J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (8)
JW-PDI-094-SG-0-1-20230816	Benzo(a)anthracene Chrysene	J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (RPD) (9)
JW-RB-06-20230816	Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Benzo(a)pyrene Benzo(g,h,i)perylene	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P	Laboratory control samples (%R) (10)
JW-RB-06-20230816	Phenanthrene Carbazole	J (all detects) J (all detects)	P	Laboratory control samples (RPD) (10)
JW-PDI-110-SG-0-1-20230816 JW-PDI-095-SG-0-1-20230816 JW-PDI-096-SG-0-1-20230816 JW-PDI-098-SG-0-1-20230816	Fluoranthene Pyrene Chrysene	Not reportable	A	Overall assessment of data (22)
JW-PDI-110-SG-0-1-20230816DL JW-PDI-095-SG-0-1-20230816DL JW-PDI-096-SG-0-1-20230816DL JW-PDI-098-SG-0-1-20230816DL	All analytes except Fluoranthene Pyrene Chrysene	Not reportable	A	Overall assessment of data (22)
JW-PDI-097-SG-0-1-20230816	Chrysene	Not reportable	A	Overall assessment of data (22)
JW-PDI-097-SG-0-1-20230816DL	All analytes except Chrysene	Not reportable	A	Overall assessment of data (22)

Jeld-Wen
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 23H0444

No Sample Data Qualified in this SDG

LDC #: 57832B2b **VALIDATION COMPLETENESS WORKSHEET** Date: 12/12/23
SDG #: 23H0444 Stage 2B Page: 1 of 2
Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer: EF
2nd Reviewer: AC

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW-846 Method 8270E-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	%RSD ≤ 20, 1 ICV ≤ 30
IV.	Continuing calibration	SW	CCV ≤ 20
V.	Laboratory Blanks	SW	
VI.	Field blanks	SW	RB = 12
VII.	Surrogate spikes	SW	
VIII.	Matrix spike/Matrix spike duplicates	SW	
IX.	Laboratory control samples	SW	LCS 1D
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Target analyte quantitation	N	
XIII.	Target analyte identification	N	
XIV.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank

	Client ID	Lab ID	Matrix	Date
1	JW-PDI-094-SG-0-1-20230816	23H0444-01	Soil	08/16/23
2	JW-PDI-111-SG-0-1-20230816	23H0444-05	Soil	08/16/23
3	JW-PDI-110-SG-0-1-20230816	23H0444-06	Soil	08/16/23
4	JW-PDI-110-SG-0-1-20230816DL	23H0444-06DL	Soil	08/16/23
5	JW-PDI-095-SG-0-1-20230816	23H0444-08	Soil	08/16/23
6	JW-PDI-095-SG-0-1-20230816DL	23H0444-08DL	Soil	08/16/23
7	JW-PDI-112-SG-0-1-20230816	23H0444-09	Soil	08/16/23
8	JW-PDI-096-SG-0-1-20230816	23H0444-10	Soil	08/16/23
9	JW-PDI-096-SG-0-1-20230816DL	23H0444-10DL	Soil	08/16/23
10	JW-PDI-097-SG-0-1-20230816	23H0444-12	Soil	08/16/23
11	JW-PDI-097-SG-0-1-20230816DL	23H0444-12DL	Soil	08/16/23
12	JW-RB-06-20230816	23H0444-14	Water	08/16/23
13	JW-PDI-098-SG-0-1-20230816	23H0444-16	Soil	08/16/23
14	JW-PDI-098-SG-0-1-20230816DL	23H0444-16DL	Soil	08/16/23
15	JW-PDI-113-SG-0-1-20230816	23H0444-17	Soil	08/16/23

LDC #: 57832B2b **VALIDATION COMPLETENESS WORKSHEET** Date: 12/12/23
SDG #: 23H0444 Stage 2B Page: 2 of 2
Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer: PD
2nd Reviewer:

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW-846 Method 8270E-SIM)

	Client ID	Lab ID	Matrix	Date
16	JW-PDI-094-SG-0-1-20230816MS	23H0444-01MS	Soil	08/16/23
17	JW-PDI-094-SG-0-1-20230816MSD	23H0444-01MSD	Soil	08/16/23
18				
19				
20				

Notes:

1	BLH0560-BLK1						
2	BLH0604-BLK1						

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	CC. Dimethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	GGGG. C30-Hopane	I1. Methyl methanesulfonate
B. Bis (2-chloroethyl) ether	DD. Acenaphthylene	FFF. Di-n-octylphthalate	HHHH. 1-Methylphenanthrene	J1. Ethyl methanesulfonate
C. 2-Chlorophenol	EE. 2,6-Dinitrotoluene	GGG. Benzo(b)fluoranthene	IIII. 1,4-Dioxane	K1. o,o',o''-Triethylphosphorothioate
D. 1,3-Dichlorobenzene	FF. 3-Nitroaniline	HHH. Benzo(k)fluoranthene	JJJJ. Acetophenone	L1. n-Phenylene diamine
E. 1,4-Dichlorobenzene	GG. Acenaphthene	III. Benzo(a)pyrene	KKKK. Atrazine	M1. 1,4-Naphthoquinone
F. 1,2-Dichlorobenzene	HH. 2,4-Dinitrophenol	JJJ. Indeno(1,2,3-cd)pyrene	LLLL. Benzaldehyde	N1. N-Nitro-o-toluidine
G. 2-Methylphenol	II. 4-Nitrophenol	KKK. Dibenz(a,h)anthracene	MMMM. Caprolactam	O1. 1,3,5-Trinitrobenzene
H. 2,2'-Oxybis(1-chloropropane)	JJ. Dibenzofuran	LLL. Benzo(g,h,i)perylene	NNNN. 2,6-Dichlorophenol	P1. Pentachlorobenzene
I. 4-Methylphenol	KK. 2,4-Dinitrotoluene	MMM. Bis(2-Chloroisopropyl)ether	OOOO. 1,2-Diphenylhydrazine	Q1. 4-Aminobiphenyl
J. N-Nitroso-di-n-propylamine	LL. Diethylphthalate	NNN. Aniline	PPPP. 3-Methylphenol	R1. 2-Naphthylamine
K. Hexachloroethane	MM. 4-Chlorophenyl-phenyl ether	OOO. N-Nitrosodimethylamine	QQQQ. 3&4-Methylphenol	S1. Triphenylene
L. Nitrobenzene	NN. Fluorene	PPP. Benzoic Acid	RRRR. 4-Dimethyldibenzothiophene (4MDT)	T1. Octachlorostyrene
M. Isophorone	OO. 4-Nitroaniline	QQQ. Benzyl alcohol	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	U1. Famphur
N. 2-Nitrophenol	PP. 4,6-Dinitro-2-methylphenol	RRR. Pyridine	TTTT. 1-Methyldibenzothiophene (1MDT)	V1. 1,4-phenylenediamine
O. 2,4-Dimethylphenol	QQ. N-Nitrosodiphenylamine	SSS. Benzidine	UUUU.. 2,3,4,6-Tetrachlorophenol	W1. Methapyrilene
P. Bis(2-chloroethoxy)methane	RR. 4-Bromophenyl-phenylether	TTT. 1-Methylnaphthalene	VVVV. 1,2,4,5-Tetrachlorobenzene	X1. Pentachloroethane
Q. 2,4-Dichlorophenol	SS. Hexachlorobenzene	UUU.Benzo(b)thiophene	WWWW.. 2-Picoline	Y1. 3,3'-Dimethylbenzidine
R. 1,2,4-Trichlorobenzene	TT. Pentachlorophenol	VVV.Benzonaphthothiophene	XXXX. 3-Methylcholanthrene	Z1. o-Toluidine
S. Naphthalene	UU. Phenanthrene	WWW.Benzo(e)pyrene	YYYY. a,a-Dimethylphenethylamine	A2. 1-Naphthylamine
T. 4-Chloroaniline	VV. Anthracene	XXX. 2,6-Dimethylnaphthalene	ZZZZ. Hexachloropropene	B2. 4-Aminobiphenyl
U. Hexachlorobutadiene	WW. Carbazole	YYY. 2,3,5-Trimethylnaphthalene	A1. N-Nitrosodiethylamine	C2. 4-Nitroquinoline-1-oxide
V. 4-Chloro-3-methylphenol	XX. Di-n-butylphthalate	ZZZ. Perylene	B1. N-Nitrosodi-n-butylamine	D2. Hexachloropene
W. 2-Methylnaphthalene	YY. Fluoranthene	AAAA. Dibenzothiophene	C1. N-Nitrosomethylethylamine	E2. Bis (2-chloro-1-methylethyl) ether
X. Hexachlorocyclopentadiene	ZZ. Pyrene	BBBB. Benzo(a)fluoranthene	D1. N-Nitrosomorpholine	F2. Bifenthrin
Y. 2,4,6-Trichlorophenol	AAA. Butylbenzylphthalate	CCCC. Benzo(b)fluorene	E1. N-Nitrosopyrrolidine	G2. Cyfluthrin
Z. 2,4,5-Trichlorophenol	BBB. 3,3'-Dichlorobenzidine	DDDD. cis/trans-Decalin	F1. Phenacetin	H2. Cypermethrin
AA. 2-Chloronaphthalene	CCC. Benzo(a)anthracene	EEEE. 1,1'-Biphenyl	G1. 2-Acetylaminofluorene	I2. Permethrin (cis/trans)
BB. 2-Nitroaniline	DDD. Chrysene	FFFF. Retene	H1. Pronamide	J2. 5-Nitro-o-toluidine

LDC #: 57832B2b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270 E) SIM

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument?

Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?

Y N N/A Were all %D and RRFs within the validation criteria of ≤20%D and ≥0.05 RRF ?

(5)

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	9/23/23	SLI0368-	JJJ	23.6		all water	J/UA ND
	2226	ICV2	KKK	27.6		↓	↓ ↓
	9/29/23	SLI0466-	HHH	21.2		1,2,3,5,7,8,10,13	J det /A all Det
	1216	ICV1				BLH0560 - BLK)	
	9/30/23	SLI0483-	DD	23.6		4,6,9,11,14,17	J det /A all Det
	0827	ICV1	GGG	28.4		↓	J det /A ↓

LDC #: 57832 B2b

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270 C) SIM

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

(7)

Blank extraction date: 8/23/23 **Blank analysis date:** 9/24/23
Conc. units: ug/L Associated Samples: all water 7 MB

Compound	Blank ID								
	BLH0604-BLK1								
WW	0.005	5X							

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID								

LDC #: 57832 B2b

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270 E) SIM

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

X N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

(7)

Blank extraction date: 8/22/23 **Blank analysis date:** 9/29/23
Conc. units: ug/kg Associated Samples: All Soils > MB

Compound	Blank ID							
	BLHD560-BLK1							
S	0.95							
W	0.19							
GG	0.10							
UU	0.18							
YY	0.11							
DDD	0.09							
GGG	0.09							

Blank extraction date: ↓ **Blank analysis date:** ↓
Conc. units: ↓ Associated Samples: All Soils > MB

Compound	Blank ID							
	↓							
ZZ	0.10							

LDC #: 57832.B26

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: FT

SVOA
METHOD: GC/MS ~~VOA~~ (EPA SW 846 Method ~~8260~~) 8270E-SIM

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds detected in the field blanks?

(b)

Sample: RB Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units (ug/L)
S	0.010
MM	0.035
WW	0.026

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ( )

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ( )

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ( )

LDC #: 57832 B2b

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270 E) SIM

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Were percent recoveries (%R) for surrogates within QC limits?
Y N N/A If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
Y N N/A If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Sample ID	Surrogate	%R (Limits)	Qualifications
	BLH0604 - BLK1	KKK-d14	24.3 (29-120)	ND
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
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			( )	
			( )	
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			( )	
			( )	
			( )	
			( )	

(NBZ) = Nitrobenzene - d5
(FBP) = 2-Fluorobiphenyl
(TPH) = Terphenyl - d14
(2FP) = 2-Fluorophenol
(TBP) = 2,4,6 -Tribromophenol
(2CP) = 2-Chlorophenol - d4

LDC #: 57832B26

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: FT

METHOD: GCMS VOA (EPA SW 846 Method 8270 E) SIM

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?

Y N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

Y N N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

%R = 8

%RPD = 9

#	MS/MSD ID	Compound	MS %Recovery	MSD %Recovery	MS/MSD %Recovery Limits	RPD (Limits)	Associated Samples	Qualifications
	16 + 17	YY	253	172	50-150	( )	#1	Jdet /Δ all Pst
		ZZ	257	161		( )		
		CCC	198			( )		
		DDD	238			~~37.5~~ ( )		
		CCC				37.5 (35)		
		DDD				36.9 ( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
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						( )		
						( )		

LDC #: 57832B2D

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

METHOD: GC/MS SVOA (EPA SW 846 Method 8270 E) SIM

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y N N/A Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?

Level IV/D Only

Y N N/A Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

(10)

LCS/LCSD ID	Compound	LCS % Recovery	LCSD % Recovery	LCS/LCSD %Recovery limits	RPD (Limits)	Associated Samples	Qualifications	
BLH0604-	JJJ	48.4		60-140	( )	all water	J/UJ/P	ND
Las ID	KKK	45.6		↓	( )	↓	↓	↓
	III	57.9		↓	( )	↓	↓	↓
	MM				30.3 (30)	↓	J det /P	~~ND~~ Det
	NN				34.0 ( )	↓	↓	Det
	YY				30.1 ( )	↓	↓	ND
	CCC				32.6 ( )	↓	↓	↓
	DDD				30.6 ( )	↓	↓	↓
	GGG				33.9 ( )	↓	↓	↓
	HHH				33.3 ( )	↓	↓	↓
Benzo(j)fluoranthene					32.1 ( )	↓	↓	↓
Benzo(b)fluoranthene, Total					33.1 ( )	↓	↓	↓
	III				32.3 ( )	↓	↓	↓
	ZZZ				34.6 ( )	↓	↓	↓
	JJJ				33.0 ( )	↓	↓	↓
	KKK				32.7 ( )	↓	↓	↓
	LLL				32.1 ( )	↓	↓	↓
LLL	III	53.6		60-140	( )	↓	J/UJ/P	ND
					( )			
					( )			
					( )			
					( )			
					( )			
					( )			

LDC #: 57832 B2b

VALIDATION FINDINGS WORKSHEET
Target Analyte Quantitation

Reviewer: FT

METHOD: SVOA GCMS 8270 E SIM

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results? (20)

#	Associated Samples	Compound Name	Findings	Qualifications
	3, 5, 8, 13	YY, ZZ, DDD	x'd cal Range	NR/A
	10	DDD	↓	NR/A

Comments: See sample calculation verification worksheet for recalculations

LDC #: 57832B26

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: 1 of 1
Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270 B SIM)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

(Y) N N/A Was the overall quality and usability of the data acceptable?

22

#	Sample ID	Compound	Finding	Qualifications
	3, 5, 8, 13	YY, ZZ, DDD	x'ol cal Range	NR/Δ
	4, 6, 9, 14	all except above	diluted	NR/Δ
	10	DDD	x'ol cal Range	NR/Δ
	11	all except DDD	diluted	NR/Δ

Comments: _____

OVR.wpd

LDC Report# 57832B3b

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: December 14, 2023

Parameters: Polychlorinated Biphenyls

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0444

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-PDI-094-SG-0-1-20230816	23H0444-01	Soil	08/16/23
JW-PDI-111-SG-0-1-20230816	23H0444-05	Soil	08/16/23
JW-PDI-095-SG-0-1-20230816	23H0444-08	Soil	08/16/23
JW-PDI-096-SG-0-1-20230816	23H0444-10	Soil	08/16/23
JW-PDI-097-SG-0-1-20230816	23H0444-12	Soil	08/16/23
JW-RB-06-20230816	23H0444-14	Water	08/16/23
JW-PDI-098-SG-0-1-20230816	23H0444-16	Soil	08/16/23
JW-PDI-111-SG-0-1-20230816MS	23H0444-05MS	Soil	08/16/23
JW-PDI-111-SG-0-1-20230816MSD	23H0444-05MSD	Soil	08/16/23

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all analytes.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all analytes.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all analytes.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample JW-RB-06-20230816 was identified as a field blank. No contaminants were found.

VI. Surrogates/Internal Standards

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

All internal standard areas and retention times were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Analyte	LCS %R (60-140)	LCSD %R (60-140)	Affected Analyte	Flag	A or P
BLH0605-LCS/LCSD (All water samples in SDG 23H0444)	Aroclor-1016	-	59.9	Aroclor-1016 Aroclor-1221 Aroclor-1232 Aroclor-1242	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P

Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Target Analyte Quantitation

Raw data were not reviewed for Stage 2B validation.

XI. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Data qualified due to LCS/LCSD %R are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polychlorinated Biphenyls - Data Qualification Summary - SDG 23H0444

Sample	Analyte	Flag	A or P	Reason (Code)
JW-RB-06-20230816	Aroclor-1016 Aroclor-1221 Aroclor-1232 Aroclor-1242	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P	Laboratory control samples (%R) (10)

Jeld-Wen
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG 23H0444

No Sample Data Qualified in this SDG

LDC #: 57832B3b
SDG #: 23H0444
Laboratory: Analytical Resources, Inc., Tukwila, WA

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 12/12/23
Page: 1 of 1
Reviewer: KJ
2nd Reviewer: K

METHOD: GC Polychlorinated Biphenyls (EPA SW-846 Method 8082A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	Initial calibration/ICV	A/A	%RSD/ICV ≤ 20
III.	Continuing calibration	A	CCV ≤ 20
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	RB = 6
VI.	Surrogate spikes /15	A/A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	SW	
IX.	Field duplicates	N	
X.	Target analyte quantitation	N	
XI.	Target analyte identification	N	
XII	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	JW-PDI-094-SG-0-1-20230816	23H0444-01	Soil	08/16/23
2	JW-PDI-111-SG-0-1-20230816	23H0444-05	Soil	08/16/23
3	JW-PDI-095-SG-0-1-20230816	23H0444-08	Soil	08/16/23
4	JW-PDI-096-SG-0-1-20230816	23H0444-10	Soil	08/16/23
5	JW-PDI-097-SG-0-1-20230816	23H0444-12	Soil	08/16/23
6	JW-RB-06-20230816 RB	23H0444-14	Water	08/16/23
7	JW-PDI-098-SG-0-1-20230816	23H0444-16	Soil	08/16/23
8	JW-PDI-111-SG-0-1-20230816MS	23H0444-05MS	Soil	08/16/23
9	JW-PDI-111-SG-0-1-20230816MSD	23H0444-05MSD	Soil	08/16/23
10				
11				
12				
13				

Notes:

-	BLH0559 - BLK1						
-	BLH0605 - BLK1						

LDC #: 57832 B3b

VALIDATION FINDINGS WORKSHEET

Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: FT

METHOD: ✓ **GC** ___ **HPLC**

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y [✓ N] N/A Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?

Level IV/D Only

Y N [✓ N/A] Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

(10)

LCS/LCSD ID	Compound	LCS % Recovery	LCSD % Recovery	LCS/LCSD %Recovery limits	RPD (Limits)	Associated Samples	Qualifications
BLH0605 –	~~BB~~ V		59.9	60 - 140	( )	all water	J/UJ/P ND
lcsD					( )		qual Y, W, X, Y
					( )		
					( )		
					( )		
					( )		
					( )		
					( )		
					( )		
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VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG. Chlordane
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH. Chlordane (Technical)
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II. Aroclor 1262
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ. Aroclor 1268
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. 2,4'-DDD	KK. Oxychlordane
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. 2,4'-DDE	LL. trans-Nonachlor
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE. 2,4'-DDT	MM. cis-Nonachlor
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF. Hexachlorobenzene	NN.

Notes:_____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: January 16, 2024

Parameters: Wet Chemistry

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA/
Materials Testing & Consulting, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0444/23B014-22

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-PDI-094-SG-0-1-20230816	23H0444-01	Soil	08/16/23
JW-PDI-107-SG-0-1-20230816	23H0444-04	Soil	08/16/23
JW-PDI-111-SG-0-1-20230816	23H0444-05	Soil	08/16/23
JW-PDI-110-SG-0-1-20230816	23H0444-06	Soil	08/16/23
JW-PDI-095-SG-0-1-20230816	23H0444-08	Soil	08/16/23
JW-PDI-112-SG-0-1-20230816	23H0444-09	Soil	08/16/23
JW-PDI-096-SG-0-1-20230816	23H0444-10	Soil	08/16/23
JW-PDI-097-SG-0-1-20230816	23H0444-12	Soil	08/16/23
JW-PDI-098-SG-0-1-20230816	23H0444-16	Soil	08/16/23
JW-PDI-113-SG-0-1-20230816	23H0444-17	Soil	08/16/23
JW-PDI-094-SG-0-1-20230816DUP	23H0444-01DUP	Soil	08/16/23
JW-PDI-094-SG-0-1-20230816TRP	23H0444-01TRP	Soil	08/16/23

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Moisture Content by American Society for Testing and Material (ASTM) C556 and ASTM D2216
Organic Matter by ASTM D2974
Total Solids by ASTM D2216

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Less than reporting limit
25 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

Initial calibration analysis was not required by the methods.

III. Continuing Calibration

Continuing calibration frequency and analysis was not required by the methods.

IV. Laboratory Blanks

Laboratory blank analysis was not required by the methods.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the methods.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were not required by the methods.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Target Analyte Quantitation

Raw data were not reviewed for Stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Jeld-Wen
Wet Chemistry - Data Qualification Summary - SDG 23H0444/23B014-22

No Sample Data Qualified in this SDG

Jeld-Wen
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 23H0444/23B014-22

No Sample Data Qualified in this SDG

LDC #: 57832B6 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/12/23

SDG #: 23H0444/23B014-22 Stage 2B Page: 1 of 1

Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer: NF

Sub-Laboratory: Materials Testing & Consulting, Inc., Tukwila, WA 2nd Reviewer: A

METHOD: (Analyte) Moisture Content (ASTM C556/ASTM D2216), Organic Matter (ASTM D2974), Total Solids (ASTM D2216)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II	Initial calibration	N	
III.	Calibration verification	N	
IV	Laboratory Blanks	N	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	N	
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	N	
IX.	Field duplicates	N	
X.	Target Analyte Quantitation	N	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	JW-PDI-094-SG-0-1-20230816	23H0444-01	Soil	08/16/23
2	JW-PDI-107-SG-0-1-20230816	23H0444-04	Soil	08/16/23
3	JW-PDI-111-SG-0-1-20230816	23H0444-05	Soil	08/16/23
4	JW-PDI-110-SG-0-1-20230816	23H0444-06	Soil	08/16/23
5	JW-PDI-095-SG-0-1-20230816	23H0444-08	Soil	08/16/23
6	JW-PDI-112-SG-0-1-20230816	23H0444-09	Soil	08/16/23
7	JW-PDI-096-SG-0-1-20230816	23H0444-10	Soil	08/16/23
8	JW-PDI-097-SG-0-1-20230816	23H0444-12	Soil	08/16/23
9	JW-PDI-098-SG-0-1-20230816	23H0444-16	Soil	08/16/23
10	JW-PDI-113-SG-0-1-20230816	23H0444-17	Soil	08/16/23
11	JW-PDI-094-SG-0-1-20230816DUP	23H0444-01DUP	Soil	08/16/23
12	JW-PDI-094-SG-0-1-20230816TRP	23H0444-01TRP	Soil	08/16/23
13				
14				
15				

Notes:

All elements are applicable to each sample as noted below.

Sample ID	Target Analyte List
1-10	Moisture Content, Organic Matter
1, 3, 5, 7-9	Total Solids
QC	
11-12	Moisture Content, Organic Matter

LDC Report# 57832B21

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: December 19, 2023

Parameters: Polychlorinated Dioxins/Dibenzofurans

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0444

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-PDI-094-SG-0-1-20230816	23H0444-01	Soil	08/16/23
JW-PDI-081-SG-0-1-20230816	23H0444-03	Soil	08/16/23
JW-PDI-111-SG-0-1-20230816	23H0444-05	Soil	08/16/23
JW-PDI-083-SG-0-1-20230816	23H0444-07	Soil	08/16/23
JW-PDI-095-SG-0-1-20230816	23H0444-08	Soil	08/16/23
JW-PDI-096-SG-0-1-20230816	23H0444-10	Soil	08/16/23
JW-PDI-084-SG-0-1-20230816	23H0444-11	Soil	08/16/23
JW-PDI-097-SG-0-1-20230816	23H0444-12	Soil	08/16/23
JW-PDI-085-SG-0-1-20230816	23H0444-13	Soil	08/16/23
JW-RB-06-20230816	23H0444-14	Water	08/16/23
JW-PDI-086-SG-0-1-20230816	23H0444-15	Soil	08/16/23
JW-PDI-098-SG-0-1-20230816	23H0444-16	Soil	08/16/23

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for High Resolution Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Dioxins/Dibenzofurans by Environmental Protection Agency (EPA) Method 1613B

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25%.

The static resolving power was at least 10,000 (10% valley definition).

III. Initial Calibration and Initial Calibration Verification

A five point initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all analytes and less than or equal to 35.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were within the QC limits for all analytes and labeled compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration results were within the QC limits for all analytes and labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Analyte	Concentration (pg/L)	Associated Samples
BLH0631-BLK2	08/24/23	OCDF OCDD	5.53 27.6	All water samples in SDG 23H0444

Blank ID	Extraction Date	Analyte	Concentration (ng/Kg)	Associated Samples
BLI0069-BLK1	09/11/23	OCDF OCDD	1.59 7.11	All soil samples in SDG 23H0444

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration (pg/L)	Modified Final Concentration (pg/L)
JW-RB-06-20230816	OCDD	18.5	18.5U

VI. Field Blanks

Sample JW-RB-06-20230816 was identified as a rinse blank. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration (pg/L)
JW-RB-06-20230816	OCDD	18.5

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Labeled Compounds

All percent recoveries (%R) for labeled compounds used to quantitate target analytes were within QC limits.

XI. Target Analyte Quantitation

All target analyte quantitations were within validation criteria with the following exceptions:

Sample	Analyte	Flag	A or P
All samples in SDG 23H0444	All analytes reported by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A

Raw data were not reviewed for Stage 2B validation.

XII. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Data qualified due to results reported by the laboratory as EMPCs and laboratory blank contamination are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Data Qualification Summary - SDG 23H0444

Sample	Analyte	Flag	A or P	Reason (Code)
JW-PDI-094-SG-0-1-20230816 JW-PDI-081-SG-0-1-20230816 JW-PDI-111-SG-0-1-20230816 JW-PDI-083-SG-0-1-20230816 JW-PDI-095-SG-0-1-20230816 JW-PDI-096-SG-0-1-20230816 JW-PDI-084-SG-0-1-20230816 JW-PDI-097-SG-0-1-20230816 JW-PDI-085-SG-0-1-20230816 JW-RB-06-20230816 JW-PDI-086-SG-0-1-20230816 JW-PDI-098-SG-0-1-20230816	All analytes reported by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A	Target analyte quantitation (EMPC) (23)

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG 23H0444

Sample	Analyte	Modified Final Concentration (pg/L)	A or P	Code
JW-RB-06-20230816	OCDD	18.5U	A	7

LDC #: 57832B21 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/12/23
SDG #: 23H0444 Stage 2B Page: 1 of 1
Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: HRGC/HRMS Polychlorinated Dioxins/Dibenzofurans (EPA Method 1613B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	%RSD ≤ 20/35 ICV = QC limit
IV.	Continuing calibration	A	CCV = QC limit
V.	Laboratory Blanks	SW	
VI.	Field blanks	SW	RB = 10
VII.	Matrix spike/Matrix spike duplicates	N	LCS
VIII.	Laboratory control samples	A	
IX.	Field duplicates	N	
X.	Labeled Compounds	A	
XI.	Target analyte quantitation	SW	
XII.	Target analyte identification	N	
XIII	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	JW-PDI-094-SG-0-1-20230816	23H0444-01	Soil	08/16/23
2	JW-PDI-081-SG-0-1-20230816	23H0444-03	Soil	08/16/23
3	JW-PDI-111-SG-0-1-20230816	23H0444-05	Soil	08/16/23
4	JW-PDI-083-SG-0-1-20230816	23H0444-07	Soil	08/16/23
5	JW-PDI-095-SG-0-1-20230816	23H0444-08	Soil	08/16/23
6	JW-PDI-096-SG-0-1-20230816	23H0444-10	Soil	08/16/23
7	JW-PDI-084-SG-0-1-20230816	23H0444-11	Soil	08/16/23
8	JW-PDI-097-SG-0-1-20230816	23H0444-12	Soil	08/16/23
9	JW-PDI-085-SG-0-1-20230816	23H0444-13	Soil	08/16/23
10	JW-RB-06-20230816	23H0444-14	Water	08/16/23
11	JW-PDI-086-SG-0-1-20230816	23H0444-15	Soil	08/16/23
12	JW-PDI-098-SG-0-1-20230816	23H0444-16	Soil	08/16/23
13				
14	BLH0631-BLK2			
15	BLI0069-BLK1			
16				

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

A. 2,3,7,8-TCDD	F. 1,2,3,4,6,7,8-HpCDD	K. 1,2,3,4,7,8-HxCDF	P. 1,2,3,4,7,8,9-HpCDF	U. Total HpCDD
B. 1,2,3,7,8-PeCDD	G. OCDD	L. 1,2,3,6,7,8-HxCDF	Q. OCDF	V. Total TCDF
C. 1,2,3,4,7,8-HxCDD	H. 2,3,7,8-TCDF	M. 2,3,4,6,7,8-HxCDF	R. Total TCDD	W. Total PeCDF
D. 1,2,3,6,7,8-HxCDD	I. 1,2,3,7,8-PeCDF	N. 1,2,3,7,8,9-HxCDF	S. Total PeCDD	X. Total HxCDF
E. 1,2,3,7,8,9-HxCDD	J. 2,3,4,7,8-PeCDF	O. 1,2,3,4,6,7,8-HpCDF	T. Total HxCDD	Y. Total HpCDF

Notes:_____

LDC #: 57832 B21

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: FT

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". (7)

Y N N/A Were all samples associated with a method blank?

Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?

Y N N/A Was the method blank contaminated?

Blank extraction date: 8/24/23 **Blank analysis date:** 10/20/23 **Associated samples:** all water

Conc. units: pg/L

Compound	Blank ID	Sample Identification								
	BLH06	B1-BLK2		10						
Q	5.53			-						
G	27.6			18.5 U						

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 57832B21

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: FT

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". (7)

Y N N/A Were all samples associated with a method blank?

Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?

Y N N/A Was the method blank contaminated?

Blank extraction date: 9/11/23 **Blank analysis date:** 10/23/23 **Associated samples:** all soils (7 5X)

Conc. units: pg/kg

Compound	Blank ID	5X	Sample Identification							
	BLI0069-BLK1									
Q	1.59	7.95								
G	7.11	35.55								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 57832B21

VALIDATION FINDINGS WORKSHEET
Field Blanks

METHOD: 1613B

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds detected in the field blanks?

(6)

Sample: 10 = RB Field Blank / Rinsate Blank/ Equipment Blank / Rinsate (circle one)

Compound	Concentration Units (pg/L
G	18.5

Sample: _____ Field Blank / Rinsate Blank/ Equipment Blank / Rinsate (circle one)

Compound	Concentration Units ( )

LDC #: 57832B21

VALIDATION FINDINGS WORKSHEET
Target Analyte Quantitation and Reported CRQLs

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N (N/A) Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the compound?
Y N (N/A) Compound quantitation and CRQLs were adjusted to reflect all sample dilutions and dry weight factors (if necessary). (23)

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		All	All analytes qualified as EMPC by the lab		J (all detects)

Comments: See sample calculation verification worksheet for recalculations

LDC Report# 57832C1a

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: December 19, 2023

Parameters: Volatiles

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0501

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-PDI-Drum1-20230817	23H0501-11	Soil	08/17/23
JW-PDI-Drum2-20230817	23H0501-12	Soil	08/17/23

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) SW 846 Method 8260D

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A bromofluorobenzene (BFB) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For analytes where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 20.0%

In the case where the laboratory used a calibration curve to evaluate the analytes, all coefficients of determination (r2) were greater than or equal to 0.990.

Average relative response factors (RRF) for all analytes were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all analytes.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all analytes with the following exceptions:

Date	Analyte	%D	Associated Samples	Flag	A or P
08/21/23	Trichlorofluoromethane	23.2	JW-PDI-Drum2-20230817	NA	-
08/22/23	Trichlorofluoromethane trans-1,3-Dichloropropene	21.8 21.0	JW-PDI-Drum1-20230817	NA	-

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Target Analyte Quantitation

Raw data were not reviewed for Stage 2B validation.

XIII. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Jeld-Wen
Volatiles - Data Qualification Summary - SDG 23H0501

No Sample Data Qualified in this SDG

Jeld-Wen
Volatiles - Laboratory Blank Data Qualification Summary - SDG 23H0501

No Sample Data Qualified in this SDG

LDC #: 57832C1a **VALIDATION COMPLETENESS WORKSHEET** Date: 12/12/23
SDG #: 23H0501 Stage 2B Page: 1 of 1
Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer: EJ
2nd Reviewer: A

METHOD: GC/MS Volatiles (EPA SW-846 Method 8260D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	%D RSD ≤ 20, r^2 ICV ≤ 30
IV.	Continuing calibration	SW	CCV ≤ 20
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS ID
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Target analyte quantitation	N	
XIII.	Target analyte identification	N	
XIV	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	JW-PDI-Drum1-20230817	23H0501-11	Soil	08/17/23
2	JW-PDI-Drum2-20230817	23H0501-12	Soil	08/17/23
3				
4				
5				
6				
7				
8				
9				
10				

Notes:

1	BLH0598-BLK1							
2	BLH0570-BLK1							

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl chloride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methylcyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1. 2-Propanol
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1. Ethylene Dibromide

LDC #: 57832cla

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: FT

METHOD: GC/MS VOA (EPA SW 846 Method 8260 D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ? (5)
Y N N/A Were all %D and RRFs within the validation criteria of ≤20 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: <20.0%)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
	8/21/23	SLH0352-ICV1	KK	23.2		2, BLH0570-BLK1	J- (all det.) / A NV
	1125						
	8/22/23	SLH0377-ICV1	KK	21.8		1, BLH0598-BLK1	J- (all det.) / A on NV
	1146		W	21.0		↓	J

LDC Report# 57832C2b

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: December 18, 2023

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0501

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-FB-01-20230817	23H0501-01	Water	08/17/23
JW-PDI-099-SG-01-20230817	23H0501-03	Soil	08/17/23
JW-PDI-100-SG-01-20230817	23H0501-04	Soil	08/17/23
JW-PDI-100-SG-01-20230817DL1	23H0501-04DL1	Soil	08/17/23
JW-PDI-100-SG-01-20230817DL2	23H0501-04DL2	Soil	08/17/23
JW-PDI-101-SG-01-20230817	23H0501-07	Soil	08/17/23
JW-PDI-102-SG-01-20230817	23H0501-09	Soil	08/17/23
JW-PDI-102-SG-01-20230817DL	23H0501-09DL	Soil	08/17/23
JW-PDI-1101-SG-01-20230817	23H0501-10	Soil	08/17/23
JW-PDI-1101-SG-01-20230817DL	23H0501-10DL	Soil	08/17/23
JW-PDI-Drum1-20230817	23H0501-11	Soil	08/17/23
JW-PDI-Drum1-20230817DL	23H0501-11DL	Soil	08/17/23
JW-PDI-Drum2-20230817	23H0501-12	Soil	08/17/23
JW-PDI-Drum2-20230817DL	23H0501-12DL	Soil	08/17/23
JW-PDI-100-SG-01-20230817MS	23H0501-04MS	Soil	08/17/23
JW-PDI-100-SG-01-20230817MSD	23H0501-04MSD	Soil	08/17/23

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270E in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Days From Sample Extraction Until Analysis	Required Holding Time (in Days) From Sample Extraction Until Analysis	Flag	A or P
JW-PDI-100-SG-01-20230817DL2	All analytes	42	40	J (all detects)	A

II. GC/MS Instrument Performance Check

Instrument performance check was performed at the required frequency.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For analytes where average relative response factors (RRFs) were utilized, percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the analytes, all coefficients of determination (r^2) were greater than or equal to 0.990.

Average relative response factors (RRF) for all analytes were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all analytes.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all analytes with the following exceptions:

Date	Analyte	%D	Associated Samples	Flag	A or P
09/23/23 (2226)	Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene	23.6 27.6	All water samples in SDG 23H0501	UJ (all non-detects) UJ (all non-detects)	A

Date	Analyte	%D	Associated Samples	Flag	A or P
09/30/23 (0827)	Acenaphthylene Benzo(b)fluoranthene	23.6 28.4	JW-PDI-099-SG-01-20230817 JW-PDI-100-SG-01-20230817 JW-PDI-101-SG-01-20230817 JW-PDI-1101-SG-01-20230817 JW-PDI-Drum1-20230817 JW-PDI-Drum2-20230817	J (all detects) J (all detects)	A
09/30/23 (1942)	1-Methylnaphthalene	23.2	JW-PDI-100-SG-01-20230817DL1 JW-PDI-102-SG-01-20230817 JW-PDI-Drum1-20230817DL JW-PDI-Drum2-20230817DL	J (all detects)	A
09/30/23 (1942)	1-Methylnaphthalene	23.2	JW-PDI-102-SG-01-20230817DL	NA	-
09/30/23 (1942)	Acenaphthylene	28.4	JW-PDI-100-SG-01-20230817DL1 JW-PDI-102-SG-01-20230817 JW-PDI-Drum2-20230817DL	J (all detects)	A
09/30/23 (1942)	Acenaphthylene	28.4	JW-PDI-102-SG-01-20230817DL JW-PDI-Drum1-20230817DL	NA	-
09/30/23 (1942)	Benzo(b)fluoranthene	32.8	JW-PDI-100-SG-01-20230817DL1 JW-PDI-102-SG-01-20230817 JW-PDI-102-SG-01-20230817DL JW-PDI-Drum1-20230817DL JW-PDI-Drum2-20230817DL	J (all detects)	A
10/04/23 (1315)	Benzo(b)fluoranthene Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene	20.8 23.2 24.4	JW-PDI-100-SG-01-20230817DL2	J (all detects) J (all detects) J (all detects)	A

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Analyte	Concentration	Associated Samples
BLH0604-BLK1	08/23/23	Carbazole	0.005 ug/L	All water samples in SDG 23H0501
BLH0617-BLK1	08/22/23	Phenanthrene	0.25 ug/Kg	All soil samples in SDG 23H0501

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks.

VI. Field Blanks

Sample JW-FB-01-20230817 was identified as a field blank. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration (ug/L)
JW-FB-01-20230817	Naphthalene Phenanthrene	0.011 0.010

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Surrogate	%R (Limits)	Affected Analyte	Flag	A or P
JW-FB-01-20230817	Dibenzo(a,h)anthracene-d14 Fluoranthene-d10	24.5 (29-120) 56.3 (57-120)	All analytes	J (all detects) UJ (all non-detects)	P
JW-PDI-099-SG-01-20230817	2-Methylnaphthalene-d10 Dibenzo(a,h)anthracene-d14	28.6 (30-160) 25.6 (29-120)	All analytes	J (all detects)	P
JW-PDI-100-SG-01-20230817DL2	2-Methylnaphthalene-d10 Dibenzo(a,h)anthracene-d14	28.8 (30.160) 21.9 (29-120)	All analytes	J (all detects)	A
JW-PDI-1101-SG-01-20230817	2-Methylnaphthalene-d10 Dibenzo(a,h)anthracene-d14 Fluoranthene-d10	13.0 (30-160) 9.64 (29-120) 21.5 (57-120)	All analytes	J (all detects)	A

Surrogates were added to all samples as required by the method. Surrogate recoveries (%R) were not within QC limits for several samples. Using professional judgment, no data were qualified when one surrogate %R was outside the QC limits and the %R was greater than or equal to 10% or for samples analyzed at greater than or equal to 5X dilution.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (50-150)	MSD (%R) (50-150)	Flag	A or P
JW-PDI-100-SG-01-20230817MS/MSD (JW-PDI-100-SG-01-20230817 JW-PDI-100-SG-01-20230817DL1 JW-PDI-100-SG-01-20230817DL2)	Anthracene	49.1	24.4	J (all detects)	A
	Benzo(a)anthracene	-	44.2	J (all detects)	
	Benzo(a)pyrene	-	-0.118	J (all detects)	
	Benzo(g,h,i)perylene	36.7	8.04	J (all detects)	
	Benzo(j)fluoranthene	47.0	15.6	J (all detects)	
	Benzo(k)fluoranthene	-	22.9	J (all detects)	
	Dibenzo(a,h)anthracene	46.3	33.7	J (all detects)	
	Indeno(1,2,3-cd)pyrene	39.0	13.1	J (all detects)	
	Phenanthrene	-	18.0	J (all detects)	

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. For JW-PDI-100-SG-01-20230817MS/MSD, no data were qualified for fluoranthene, pyrene, chrysene, and benzo(b)fluoranthene percent recoveries (%R) outside the QC limits since the parent sample results were greater than 4X the spike concentration. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Analyte	LCS %R (60-140)	LCSD %R (50-150)	Flag	A or P
BLH0604-LCS/LCSD (All water samples in SDG 23H0501)	Indeno(1,2,3-cd)pyrene	48.4	-	UJ (all non-detects)	P
	Dibenzo(a,h)anthracene	45.6	-	UJ (all non-detects)	
	Benzo(g,h,i)perylene	53.6	-	UJ (all non-detects)	
	Benzo(a)pyrene	57.9	-	UJ (all non-detects)	
BLH0617-LCS/LCSD (All soil samples in SDG 23H0501)	Benzo(a)pyrene	-	46.7	J (all detects)	P

Relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Analyte	RPD (≤30)	Flag	A or P
BLH0604-LCS/LCSD (All water samples in SDG 23H0501)	Phenanthrene	30.3	J (all detects)	P

LCS ID (Associated Samples)	Analyte	RPD (≤30)	Flag	A or P
BLH0604-LCS/LCSD (All water samples in SDG 23H0501)	Carbazole	34.0	NA	-
	Fluoranthene	30.1		
	Benzo(a)anthracene	32.6		
	Chrysene	30.6		
	Benzo(b)fluoranthene	33.9		
	Benzo(k)fluoranthene	33.3		
	Benzo(j)fluoranthene	32.1		
	Benzo(a)pyrene	32.3		
	Perylene	34.6		
	Indeno(1,2,3-cd)pyrene	33.0		
	Dibenzo(a,h)anthracene	32.7		
	Benzo(g,h,i)perylene	32.1		

X. Field Duplicates

Samples JW-PDI-101-SG-01-20230817 and JW-PDI-1101-SG-01-20230817 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/Kg)		RPD
	JW-PDI-101-SG-01-20230817	JW-PDI-1101-SG-01-20230817	
Naphthalene	5.61	1.33	123
2-Methylnaphthalene	2.68	0.69	118
1-Methylnaphthalene	1.69	0.43	119
Acenaphthylene	1.13	0.38	99
Acenaphthene	1.43	0.34	123
Dibenzofuran	2.01	0.52	118
Fluorene	3.06	0.75	121
Phenanthrene	12.0	3.73	105
Anthracene	3.64	1.43	87
Fluoranthene	39.5	18.1	74
Pyrene	38.4	16.7	79
Benzo(a)anthracene	19.0	8.01	81
Chrysene	41.3	16.2	87
Benzo(b)fluoranthene	26.6	10.4	88
Dibenzo(a,h)anthracene	13.2	4.60	97
Benzo(j)fluoranthene	10.5	4.13	87
Benzo(a)pyrene	14.3	5.87	84
Indeno(1,2,3-cd)pyrene	6.61	2.62	86
Dibenzo(a,h)anthracene	2.02	0.77	90
Benzo(g,h,i)perylene	7.94	3.09	88

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Target Analyte Quantitation

All target analyte quantitation were within validation criteria with the following exceptions:

Sample	Analyte	Reason	Flag	A or P
JW-PDI-100-SG-01-20230817	Fluoranthene Pyrene Chrysene Benzo(b)fluoranthene	Results exceeded calibration range.	J (all detects)	A
JW-PDI-100-SG-01-20230817DL1	Fluoranthene Pyrene	Results exceeded calibration range.	J (all detects)	A
JW-PDI-102-SG-01-20230817	Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(j)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Benzo(g,h,i)perylene	Results exceeded calibration range.	J (all detects)	A
JW-PDI-Drum1-20230817	Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(j)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Benzo(g,h,i)perylene	Results exceeded calibration range.	J (all detects)	A
JW-PDI-Drum2-20230817	Pyrene	Results exceeded calibration range.	J (all detects)	A

Raw data were not reviewed for Stage 2B validation.

XIII. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

In the case where more than one result was reported for an individual sample, the least technically acceptable results were deemed not reportable as follows:

Sample	Analyte	Reason	Flag	A or P
JW-PDI-100-SG-01-20230817	Fluoranthene Pyrene Chrysene Benzo(b)fluoranthene	Results exceeded calibration range.	Not reportable	A
JW-PDI-100-SG-01-20230817DL1	All analytes except Chrysene Benzo(b)fluoranthene	Results from undiluted analyses were more usable.	Not reportable	A
JW-PDI-100-SG-01-20230817DL2	All analytes except Fluoranthene Pyrene	Results from undiluted analyses were more usable.	Not reportable	A
JW-PDI-102-SG-01-20230817	Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(j)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Benzo(g,h,i)perylene	Results exceeded calibration range.	Not reportable	A
JW-PDI-102-SG-01-20230817DL	All analytes except Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(j)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Benzo(g,h,i)perylene	Results from undiluted analyses were more usable.	Not reportable	A
JW-PDI-1101-SG-01-20230817DL	All analytes	Results from undiluted analyses were more usable.	Not reportable	A

Sample	Analyte	Reason	Flag	A or P
JW-PDI-Drum1-20230817	Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(j)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Benzo(g,h,i)perylene	Results exceeded calibration range.	Not reportable	A
JW-PDI-Drum1-20230817DL	All analytes except Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(j)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Benzo(g,h,i)perylene	Results from undiluted analyses were more usable.	Not reportable	A
JW-PDI-Drum2-20230817	Pyrene	Results exceeded calibration range.	Not reportable	A
JW-PDI-Drum2-20230817DL	All analytes except Pyrene	Results from undiluted analyses were more usable.	Not reportable	A

Data qualified due to technical holding time, continuing calibration %D, surrogate %R, MS/MSD %R, and LCS/LCSD %R and RPD are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 23H0501

Sample	Analyte	Flag	A or P	Reason (Code)
JW-PDI-100-SG-01-20230817DL2	All analytes	J (all detects)	A	Technical holding times (1)
JW-FB-01-20230817	Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene	UJ (all non-detects) UJ (all non-detects)	A	Continuing calibration (%D) (5)
JW-PDI-099-SG-01-20230817 JW-PDI-100-SG-01-20230817 JW-PDI-101-SG-01-20230817 JW-PDI-1101-SG-01-20230817 JW-PDI-Drum1-20230817 JW-PDI-Drum2-20230817	Acenaphthylene Benzo(b)fluoranthene	J (all detects) J (all detects)	A	Continuing calibration (%D) (5)
JW-PDI-102-SG-01-20230817	1-Methylnaphthalene	J (all detects)	A	Continuing calibration (%D) (5)
JW-PDI-102-SG-01-20230817	Acenaphthylene	J (all detects)	A	Continuing calibration (%D) (5)
JW-PDI-100-SG-01-20230817DL1 JW-PDI-102-SG-01-20230817DL JW-PDI-Drum1-20230817DL	Benzo(b)fluoranthene	J (all detects)	A	Continuing calibration (%D) (5)
JW-FB-01-20230817 JW-PDI-099-SG-01-20230817	All analytes	J (all detects) UJ (all non-detects)	P	Surrogates (%R) (13)
JW-PDI-100-SG-01-20230817DL2 JW-PDI-1101-SG-01-20230817	All analytes	J (all detects)	A	Surrogates (%R) (13)
JW-PDI-100-SG-01-20230817	Anthracene Benzo(j)fluoranthene Benzo(a)anthracene Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Benzo(g,h,i)perylene Phenanthrene Benzo(k)fluoranthene Benzo(j)fluoranthene Benzo(a)pyrene	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (8)
JW-FB-01-20230817	Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Benzo(g,h,i)perylene Benzo(a)pyrene	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P	Laboratory control samples (%R) (10)
JW-PDI-099-SG-01-20230817 JW-PDI-100-SG-01-20230817 JW-PDI-101-SG-01-20230817 JW-PDI-102-SG-01-20230817DL JW-PDI-1101-SG-01-20230817DL JW-PDI-Drum1-20230817DL JW-PDI-Drum2-20230817	Benzo(a)pyrene	J (all detects)	P	Laboratory control samples (%R) (10)

Sample	Analyte	Flag	A or P	Reason (Code)
JW-FB-01-20230817	Phenanthrene	J (all detects)	P	Laboratory control samples (RPD) (10)
JW-PDI-100-SG-01-20230817	Fluoranthene Pyrene Chrysene Benzo(b)fluoranthene	Not reportable	A	Overall assessment of data (22)
JW-PDI-100-SG-01-20230817DL1	All analytes except Chrysene Benzo(b)fluoranthene	Not reportable	A	Overall assessment of data (22)
JW-PDI-100-SG-01-20230817DL2	All analytes except Fluoranthene Pyrene	Not reportable	A	Overall assessment of data (22)
JW-PDI-102-SG-01-20230817	Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(j)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Benzo(g,h,i)perylene	Not reportable	A	Overall assessment of data (22)
JW-PDI-102-SG-01-20230817DL	All analytes except Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(j)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Benzo(g,h,i)perylene	Not reportable	A	Overall assessment of data (22)
JW-PDI-1101-SG-01-20230817DL	All analytes	Not reportable	A	Overall assessment of data (22)
JW-PDI-Drum1-20230817	Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(j)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Benzo(g,h,i)perylene	Not reportable	A	Overall assessment of data (22)

Sample	Analyte	Flag	A or P	Reason (Code)
JW-PDI-Drum1-20230817DL	All analytes except Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(j)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Benzo(g,h,i)perylene	Not reportable	A	Overall assessment of data (22)
JW-PDI-Drum2-20230817	Pyrene	Not reportable	A	Overall assessment of data (22)
JW-PDI-Drum2-20230817DL	All analytes except Pyrene	Not reportable	A	Overall assessment of data (22)

Jeld-Wen
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 23H0501

No Sample Data Qualified in this SDG

LDC #: 57832C2b

SDG #: 23H0501

Laboratory: Analytical Resources, Inc., Tukwila, WA

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

Date: 12/12/23

Page: 1 of 2

Reviewer: FJ

2nd Reviewer: A

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW-846 Method 8270E-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / SW	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	%RSD ≤ 20, r ICV ≤ 30
IV.	Continuing calibration	SW	CCV ≤ 20
V.	Laboratory Blanks	SW	
VI.	Field blanks	SW	FB = 1
VII.	Surrogate spikes	SW	
VIII.	Matrix spike/Matrix spike duplicates	SW	
IX.	Laboratory control samples	SW	LCS/D
X.	Field duplicates	SW	D = 6, 9
XI.	Internal standards	A	
XII.	Target analyte quantitation	SW	
XIII.	Target analyte identification	N	
XIV	Overall assessment of data	SW	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	JW-FB-01-20230817 FB	23H0501-01	Water	08/17/23
2	JW-PDI-099-SG-01-20230817	23H0501-03	Soil	08/17/23
3	JW-PDI-100-SG-01-20230817	23H0501-04	Soil	08/17/23
4	JW-PDI-100-SG-01-20230817DL1	23H0501-04DL1	Soil	08/17/23
5	JW-PDI-100-SG-01-20230817DL2	23H0501-04DL2	Soil	08/17/23
6	JW-PDI-101-SG-01-20230817 D	23H0501-07	Soil	08/17/23
7	JW-PDI-102-SG-01-20230817	23H0501-09	Soil	08/17/23
8	JW-PDI-102-SG-01-20230817DL	23H0501-09DL	Soil	08/17/23
9	JW-PDI-1101-SG-01-20230817 D no E	23H0501-10	Soil	08/17/23
10	JW-PDI-1101-SG-01-20230817DL D	23H0501-10DL	Soil	08/17/23
11	JW-PDI-Drum1-20230817	23H0501-11	Soil	08/17/23
12	JW-PDI-Drum1-20230817DL	23H0501-11DL	Soil	08/17/23
13	JW-PDI-Drum2-20230817	23H0501-12	Soil	08/17/23
14	JW-PDI-Drum2-20230817DL	23H0501-12DL	Soil	08/17/23
15	JW-PDI-100-SG-01-20230817MS	23H0501-04MS	Soil	08/17/23

LDC #: 57832C2b **VALIDATION COMPLETENESS WORKSHEET** Date: 12/12/23
SDG #: 23H0501 Stage 2B Page: 2 of 2
Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer: FT
2nd Reviewer:

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW-846 Method 8270E-SIM)

	Client ID	Lab ID	Matrix	Date
16	JW-PDI-100-SG-01-20230817MSD	23H0501-04MSD	Soil	08/17/23
17				
18				
19				

Notes:

1	BLH0604-BLK1						
2	BLH0617-BLK1						

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	CC. Dimethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	GGGG. C30-Hopane	I1. Methyl methanesulfonate
B. Bis (2-chloroethyl) ether	DD. Acenaphthylene	FFF. Di-n-octylphthalate	HHHH. 1-Methylphenanthrene	J1. Ethyl methanesulfonate
C. 2-Chlorophenol	EE. 2,6-Dinitrotoluene	GGG. Benzo(b)fluoranthene	IIII. 1,4-Dioxane	K1. o,o',o"-Triethylphosphorothioate
D. 1,3-Dichlorobenzene	FF. 3-Nitroaniline	HHH. Benzo(k)fluoranthene	JJJJ. Acetophenone	L1. n-Phenylene diamine
E. 1,4-Dichlorobenzene	GG. Acenaphthene	III. Benzo(a)pyrene	KKKK. Atrazine	M1. 1,4-Naphthoquinone
F. 1,2-Dichlorobenzene	HH. 2,4-Dinitrophenol	JJJ. Indeno(1,2,3-cd)pyrene	LLLL. Benzaldehyde	N1. N-Nitro-o-toluidine
G. 2-Methylphenol	II. 4-Nitrophenol	KKK. Dibenz(a,h)anthracene	MMMM. Caprolactam	O1. 1,3,5-Trinitrobenzene
H. 2,2'-Oxybis(1-chloropropane)	JJ. Dibenzofuran	LLL. Benzo(g,h,i)perylene	NNNN. 2,6-Dichlorophenol	P1. Pentachlorobenzene
I. 4-Methylphenol	KK. 2,4-Dinitrotoluene	MMM. Bis(2-Chloroisopropyl)ether	OOOO. 1,2-Diphenylhydrazine	Q1. 4-Aminobiphenyl
J. N-Nitroso-di-n-propylamine	LL. Diethylphthalate	NNN. Aniline	PPPP. 3-Methylphenol	R1. 2-Naphthylamine
K. Hexachloroethane	MM. 4-Chlorophenyl-phenyl ether	OOO. N-Nitrosodimethylamine	QQQQ. 3&4-Methylphenol	S1. Triphenylene
L. Nitrobenzene	NN. Fluorene	PPP. Benzoic Acid	RRRR. 4-Dimethyldibenzothiophene (4MDT)	T1. Octachlorostyrene
M. Isophorone	OO. 4-Nitroaniline	QQQ. Benzyl alcohol	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	U1. Famphur
N. 2-Nitrophenol	PP. 4,6-Dinitro-2-methylphenol	RRR. Pyridine	TTTT. 1-Methyldibenzothiophene (1MDT)	V1. 1,4-phenylenediamine
O. 2,4-Dimethylphenol	QQ. N-Nitrosodiphenylamine	SSS. Benzidine	UUUU.. 2,3,4,6-Tetrachlorophenol	W1. Methapyrilene
P. Bis(2-chloroethoxy)methane	RR. 4-Bromophenyl-phenylether	TTT. 1-Methylnaphthalene	VVVV. 1,2,4,5-Tetrachlorobenzene	X1. Pentachloroethane
Q. 2,4-Dichlorophenol	SS. Hexachlorobenzene	UUU.Benzo(b)thiophene	WWWW.. 2-Picoline	Y1. 3,3'-Dimethylbenzidine
R. 1,2,4-Trichlorobenzene	TT. Pentachlorophenol	VVV.Benzonaphthothiophene	XXXX. 3-Methylcholanthrene	Z1. o-Toluidine
S. Naphthalene	UU. Phenanthrene	WWW.Benzo(e)pyrene	YYYY. a,a-Dimethylphenethylamine	A2. 1-Naphthylamine
T. 4-Chloroaniline	VV. Anthracene	XXX. 2,6-Dimethylnaphthalene	ZZZZ. Hexachloropropene	B2. 4-Aminobiphenyl
U. Hexachlorobutadiene	WW. Carbazole	YYY. 2,3,5-Trimethylnaphthalene	A1. N-Nitrosodiethylamine	C2. 4-Nitroquinoline-1-oxide
V. 4-Chloro-3-methylphenol	XX. Di-n-butylphthalate	ZZZ. Perylene	B1. N-Nitrosodi-n-butylamine	D2. Hexachloropene
W. 2-Methylnaphthalene	YY. Fluoranthene	AAAA. Dibenzothiophene	C1. N-Nitrosomethylethylamine	E2. Bis (2-chloro-1-methylethyl) ether
X. Hexachlorocyclopentadiene	ZZ. Pyrene	BBBB. Benzo(a)fluoranthene	D1. N-Nitrosomorpholine	F2. Bifenthrin
Y. 2,4,6-Trichlorophenol	AAA. Butylbenzylphthalate	CCCC. Benzo(b)fluorene	E1. N-Nitrosopyrrolidine	G2. Cyfluthrin
Z. 2,4,5-Trichlorophenol	BBB. 3,3'-Dichlorobenzidine	DDDD. cis/trans-Decalin	F1. Phenacetin	H2. Cypermethrin
AA. 2-Chloronaphthalene	CCC. Benzo(a)anthracene	EEEE. 1,1'-Biphenyl	G1. 2-Acetylaminofluorene	I2. Permethrin (cis/trans)
BB. 2-Nitroaniline	DDD. Chrysene	FFFF. Retene	H1. Pronamide	J2. 5-Nitro-o-toluidine

LDC #: 57832c2b

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: FT

All circled dates have exceeded the technical holding times.
Y N N/A Were all cooler temperatures within validation criteria?

METHOD : GC/MA BNA SW846 METHOD 8270E SIM (1)

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
5	SOIL		8/17/23	8/23/23	10/4/23	42	J / UJ/A All Det

TECHNICAL HOLDING TIME CRITERIA

Water: Extracted within 7 days, analyzed within 40 days.
Soil: Extracted within 14 days, analyzed within 40 days.

LDC #: 57832c2b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270 E) 5 IM

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument?

Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?

Y N N/A Were all %D and RRFs within the validation criteria of ≤20%D and ≥0.05 RRF ? (5)

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	9/23/23	SLI0368-	JJJ	23.6		all water	J/UJ/A ND
	2226	ICV2	KKK	27.6		↓	↓
	9/30/23	SLI0483-	DD	23.6		2, 3, 6, 9, 11, 13, 15, 16	J dw /A all Dt
	0827	ICV1	GGG	28.4		~~BH~~ BLH0617-BIK	↓
	9/30/23	SLI0483-	TTT	23.2		4, 7, 8, 12, 14	J dw /A 4, 7, 12, 14 Dt all ~~Dt~~
	1942	ICV2	DD	28.4		↓	↓ 4, 7, 14 Dt
			GGG	32.8			↓ All Dt
	10/4/23	SLJ0053-	GGG	20.8		5	J dw /A all Dt
	1315	ICV1	JJJ	23.2			J/UJ/A
			KKK	24.4		↓	↓

LDC #: 57832c2b

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270 E) SIM

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

(7)

Blank extraction date: 8/23/23 **Blank analysis date:** 9/24/23
Conc. units: ug/L Associated Samples: all water (ND)

Compound	Blank ID							
	BLH0604-BLK1							
W W	0.005							

Blank extraction date: 8/23/23 **Blank analysis date:** 9/30/23
Conc. units: ug/Kg Associated Samples: all soils

If not used in eval

Compound	Blank ID							
	BLH0617-BLK1	8 (1000X)	14 (50X)					
UU	0.25	1.25	~~565~~ U	~~18.4~~/24.9 U				

LDC #: 57832C2b

VALIDATION FINDINGS WORKSHEET
Field Blanks

SVOA PAH

METHOD: GC/MS ~~VOA~~ (EPA SW 846 Method ~~8260~~) 8270E-SIM

(Y) N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds detected in the field blanks?

Sample: #1 = FB Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units (ug/L)
S	0.011
NN	0.010

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ( )

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ( )

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ( )

LDC #: 57832C26

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270 E) SIM

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Were percent recoveries (%R) for surrogates within QC limits?
Y (N) N/A If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
Y N (N/A) If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

(13)

#	Sample ID	Surrogate	%R (Limits)	Qualifications
	1	KKK ~~TTT~~ - d14	24.5 (29-120)	J/UJ/P ~~ND~~ ND + Det
		YY - d10	56.3 (57-120)	↓
			( )	
	2	W - d10	28.6 (30-160)	J/UJ/P all Det
		KKK - d14	25.6 (↓)	↓
			( )	
	3	KKK - d14	25.5 (↓)	NQ
			( )	
			( )	
	5	W - d10	28.8 ( )	J/UJ/A all Det
		KKK - d14	21.9 (↓)	↓
			( )	
	6	KKK - d14	20.6 (↓)	NQ
			( )	
	8, 12, 14	surrogates diluted out	( )	NQ ~~>100x~~ >5x DL
			( )	
	9	W - d10	13.0 ( )	* R J/~~UJ~~/A all Det
		KKK - d14	9.64 ( )	
		YY - d10	21.5 (↓)	↓
			( )	
	11	KKK - d14	25.0 (↓)	NQ
			( )	
	13	↓	28.7 (↓)	NQ
			( )	
			( )	
	* professional judgment		( )	

(NBZ) = Nitrobenzene - d5
(FBP) = 2-Fluorobiphenyl
(TPH) = Terphenyl - d14
(2FP) = 2-Fluorophenol
(TBP) = 2,4,6 -Tribromophenol
(2CP) = 2-Chlorophenol - d4

LDC #: 57832c2b

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

METHOD: GC/MS BNA (EPA SW 846 Method 8270 E)

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were percent recoveries (%R) for surrogates within QC limits?
Y N N/A If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
Y N N/A If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Sample ID	Surrogate	%R (Limits)	Qualifications
	BLH06O4 - BLK1	KKK - d14	24.3 (29-120)	NQ
			( )	
			( )	
			( )	
			( )	
			( )	
	BLH0617 - BLK1	KKK - d14	24.8 (30-160)	NQ
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
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			( )	
			( )	
			( )	
			( )	
			( )	

(NBZ) = Nitrobenzene - d5
(FBP) = 2-Fluorobiphenyl
(TPH) = Terphenyl - d14
(2FP) = 2-Fluorophenol
(TBP) = 2,4,6 -Tribromophenol
(2CP) = 2-Chlorophenol - d4

LDC #: 57832C2b

VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: FT

METHOD: GCMS VOA (EPA SW 846 Method 8270 E) SIM

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?

[✓ Y] N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

(8)

#	MS/MSD ID	Compound	MS %Recovery	MSD %Recovery	MS/MSD %Recovery Limits	RPD (Limits)	Associated Samples	Qualifications
	15 + 16	see	following	pages		( )	3, 4, 5	all %R = J/UJ/A
						( )		all Det
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
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						( )		
						( )		
						( )		
						( )		
						( )		

Analytical Resources, LLC
Analytical Chemists and Consultants

JW-PDI-100-SG-0-1-20230817

MS / MS DUPLICATE RECOVERY
EPA 8270E-SIM

Laboratory:	Analytical Resources, LLC	SDG:	23H0501
Client:	Anchor QEA, LLC	Project:	Jeld-Wen Step 1
Matrix:	Solid	Analyzed:	09/30/23 11:41
Batch:	BLH0617	Laboratory ID:	BLH0617-MS1
Preparation:	EPA 3546 (Microwave) Low Level	Sequence Name:	Matrix Spike
Initial/Final:	23.64 g / 0.5 mL	Source Sample:	JW-PDI-100-SG-0-1-20230817

COMPOUND	SPIKE ADDED (ug/kg dry)	SAMPLE CONCENTRATION (ug/kg dry)	Q	MS CONCENTRATION (ug/kg dry)	Q	MS % REC. #	QC LIMITS REC.
Naphthalene	15.0	6.17		15.4		61.6	~~30 - 160~~ 50-150
2-Methylnaphthalene	15.0	4.45		13.0		56.9	30 - 160
1-Methylnaphthalene	15.0	2.61		10.9		55.3	30 - 160
Acenaphthylene	15.0	1.95	Q	11.5	Q	63.5	30 - 160
Acenaphthene	15.0	5.01		13.0		53.5	30 - 160
Dibenzofuran	15.0	5.80		14.2		56.3	30 - 160
Fluorene	15.0	8.11		18.2		67.6	30 - 160
Phenanthrene	15.0	30.1		38.6		56.8	30 - 160
Anthracene VV	15.0	J|NJ/Δ 14.0		Pct 21.4		49.1 ✓	30 - 160
Fluoranthene YY	15.0	85.4 NQ	E	80.4	*, E	-33.2 ✓ *	30 - 160
Pyrene ZZ	15.0	98.6 NQ	E	98.3	*, E	-1.77 ✓ *	30 - 160
Benzo(a)anthracene	15.0	39.4		49.5		67.9	30 - 160
Chrysene DDD	15.0	79.4 NQ	E	106	*, E	181 ✓ *	30 - 160
Benzo(b)fluoranthene GGG	15.0	60.1 NQ	Q, E	66.2	Q, E	40.6 ✓	30 - 160
Benzo(k)fluoranthene	15.0	26.9		38.7		78.7	30 - 160
Benzo(j)fluoranthene ✓	15.0	J|NJ/Δ 23.9		Pct 30.9		47.0 ✓	30 - 160
Benzo(a)pyrene	15.0	35.1		43.6		56.6	30 - 160
Indeno(1,2,3-cd)pyrene JJJ	15.0	J|NJ/Δ 16.1		Pct 22.0		39.0 ✓	30 - 160
Dibenzo(a,h)anthracene KKK	15.0	↓ 4.70		11.6		46.3 ✓	30 - 160
Benzo(g,h,i)perylene LLL	15.0	↓ 19.5		25.0		36.7 ✓	~~30 - 160~~ ↓

* Values outside of QC limits

NQ = parent >4x spk Amt

Analytical Resources, LLC
Analytical Chemists and Consultants

JW-PDI-100-SG-0-1-20230817

MS / MS DUPLICATE RECOVERY
EPA 8270E-SIM

Laboratory:	Analytical Resources, LLC	SDG:	23H0501
Client:	Anchor QEA, LLC	Project:	Jeld-Wen Step 1
Matrix:	Solid	Analyzed:	09/30/23 12:13
Batch:	BLH0617	Laboratory ID:	BLH0617-MSD1
Preparation:	EPA 3546 (Microwave) Low Level	Sequence Name:	Matrix Spike Dup
Initial/Final:	23.64 g / 0.5 mL	Source Sample:	JW-PDI-100-SG-0-1-20230817

COMPOUND	SPIKE ADDED (ug/kg dry)	MSD CONCENTRATION (ug/kg dry)	Q	MSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Naphthalene	15.0	15.6		62.6	1.03	~~30~~ 35	~~30 - 160~~ 50-150
2-Methylnaphthalene	15.0	13.9		63.2	7.07	30	30 - 160
1-Methylnaphthalene	15.0	12.0		62.3	9.15	30	30 - 160
Acenaphthylene	15.0	11.1	Q	60.8	3.64	30	30 - 160
Acenaphthene	15.0	12.9		52.5	1.12	30	30 - 160
Dibenzofuran	15.0	13.7		52.4	4.16	30	30 - 160
Fluorene	15.0	17.2		60.6	5.88	30	30 - 160
Phenanthrene UU	15.0	~~82.8~~ J/NJ/B	*	18.0 ✓ *	16.3 PeT	30	30 - 160
Anthracene VV	15.0	17.7	*	24.4 ✓ *	19.0 PeT	30	30 - 160
Fluoranthene	15.0	88.9 NQ	*, E	23.3 ✓ *	10.0	30	30 - 160
Pyrene	15.0	89.2 NQ	*, E	-62.6 ✓ *	9.73	30	30 - 160
Benzo(a)anthracene CCC	15.0	46.0		44.2 ✓	7.45 PeT	30	30 - 160
Chrysene DDD	15.0	78.3 NQ	*, E	-7.20 ✓ *	30.5 *	30	30 - 160
Benzo(b)fluoranthene GGG	15.0	58.1 NQ	Q, *, E	-13.4 ✓ *	13.0	30	30 - 160
Benzo(k)fluoranthene HHH	15.0	30.3	*	22.9 ✓ *	24.3 PeT	30	30 - 160
Benzo(j)fluoranthene ✓	15.0	26.2	*	15.6 ✓ *	16.5	30	30 - 160
Benzo(a)pyrene III	15.0	35.1	*	-0.118 ✓ *	21.6	30	30 - 160
Indeno(1,2,3-cd)pyrene JJJ	15.0	18.1	*	13.1 ✓ *	19.4	30	30 - 160
Dibenzo(a,h)anthracene KKK	15.0	9.76		33.7 ✓	17.6	30	30 - 160
Benzo(g,h,i)perylene LLL	15.0	20.7	*	8.04 ✓ *	18.8	~~30~~	~~30 - 160~~

* Values outside of QC limits

NQ = parent 74x spike Amt

LDC #: 57832C2b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

METHOD: GC/MS SVOA (EPA SW 846 Method 8270 E)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y (N) N/A Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?

Level IV/D Only

Y N (N/A) Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

(10)

LCS/LCSD ID	Compound	LCS % Recovery	LCSD % Recovery	LCS/LCSD %Recovery limits	RPD (Limits)	Associated Samples	Qualifications
BLH0604-LCS ID	JJJ	48.4		60-140	( )	all water	J/UJ/P NP
	KKK	45.6			( )		
	LLL	53.6			( )		
	III	57.9			( )		
	UU				30.3 (30)		J det/P Det
	WW				34.0 ( )		NP
	YY				30.1 ( )		
	CCC				32.6 ( )		
	DDD				30.6 ( )		
	GGG				33.9 ( )		
	HHH				33.3 ( )		
Benzo(j)fluoranthene					32.1 ( )		
Benzofluoranthenes, Total					33.1 ( )		
	III				32.3 ( )		
	ZZZ				34.6 ( )		
	JJJ				33.0 ( )		
	KKK				32.7 ( )		
	LLL				32.1 ( )		
					( )		
BLH0617-LCS ID	III		46.7	50-150	( )	all soils	J/UJ/P all Det
					( )		
					( )		
					( )		
					( )		

Note: Benz, total reported in water

LDC#:57832C2b **VALIDATION FINDINGS WORKSHEET** Page:_1__of_1__
Field Duplicates Reviewer:__FT____

METHOD: (EPA Method 8270E SIM)

Compound	Concentration (ug/kg)		RPD
	6	9	
S	5.61	1.33	123
W	2.68	0.69	118
TTT	1.69	0.43	119
DD	1.13	0.38	99
GG	1.43	0.34	123
JJ	2.01	0.52	118
NN	3.06	0.75	121
UU	12.0	3.73	105
VV	3.64	1.43	87
YY	39.5	18.1	74
ZZ	38.4	16.7	79
CCC	19.0	8.01	81
DDD	41.3	16.2	87
GGG	26.6	10.4	88
KKK	13.2	4.60	97
Benzzo(j)fluoranthene	10.5	4.13	87
III	14.3	5.87	84
JJJ	6.61	2.62	86
KKK	2.02	0.77	90
LLL	7.94	3.09	88

LDC #: 57832c2b

VALIDATION FINDINGS WORKSHEET
Target Analyte Quantitation

Reviewer: FT

METHOD: SVOA SW 846 EPA Method 8270E

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

(20)

#	Associated Samples	Compound Name	Findings	Qualifications
	3	YY, ZZ, DDD, GGG	x'd cal Range	Jdw /Δ
	4	YY, ZZ	↓	
	7	YY, ZZ, CCC, DDD,	↓	
		GGG, HHH, Benzo(j) fluoranthene		
		III, JJJ, LLL		
	11	GG, NN, UU, VV, YY, ZZ,	↓	
		CCC, DDD, GGG, HHH,		
		Benzo(j)fluoranthene, III		
		JJJ, LLL		
	13	ZZ	↓	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 57832c2b

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270 ~~C~~ SIM

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

Y N N/A Was the overall quality and usability of the data acceptable?

(22)

#	Sample ID	Compound	Finding	Qualifications
	3	YY, ZZ, DDD, GGG	x'd cal Range	NR/A
	4	all except DDD, GGG	x'd cal cal Range + diluted	
	5	all except YY, ZZ	↓	
	7	YY, ZZ, CCC, DDD, GGG, HHH, Benzo (j) fluoranthene II, JJJ, LLL	x'd cal Range	
	8	all except above	diluted	
	10	all	diluted	
	11	GG, NN, UU, VV, YY, ZZ, CCC, DDD, GGG, HHH, Benzo (j) fluoranthene, III, JJJ, LLL	x'd cal Range	
	12	All except above	diluted	✓

Comments: _____

LDC #: 57832C2b

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270 ~~D~~ SIM)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

(Y) N N/A Was the overall quality and usability of the data acceptable? (22)

#	Sample ID	Compound	Finding	Qualifications
	13	ZZ	x'd cal Range	NR/Δ
	14	all except ZZ	diluted	↓

Comments: _____

LDC Report# 57832C3b

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: December 19, 2023

Parameters: Polychlorinated Biphenyls

Validation Level: Stage 2B & 4

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0501

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-PDI-099-SG-01-20230817**	23H0501-03**	Soil	08/17/23
JW-PDI-100-SG-01-20230817	23H0501-04	Soil	08/17/23
JW-PDI-101-SG-01-20230817	23H0501-07	Soil	08/17/23
JW-PDI-102-SG-01-20230817	23H0501-09	Soil	08/17/23
JW-PDI-1101-SG-01-20230817	23H0501-10	Soil	08/17/23
JW-PDI-Drum1-20230817	23H0501-11	Soil	08/17/23
JW-PDI-Drum2-20230817	23H0501-12	Soil	08/17/23
JW-PDI-100-SG-01-20230817MS	23H0501-04MS	Soil	08/17/23
JW-PDI-100-SG-01-20230817MSD	23H0501-04MSD	Soil	08/17/23

**Indicates sample underwent Stage 4 validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Stage 4 data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

NJ (Presumptive and estimated): The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all analytes.

Retention time windows were established as required by the method for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all analytes.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all analytes.

Retention times of all analytes in the calibration standards were within the established retention time windows for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Surrogates/Internal Standards

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

All internal standard areas and retention times were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

Samples JW-PDI-101-SG-01-20230817 and JW-PDI-1101-SG-01-20230817 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/Kg)		RPD
	JW-PDI-101-SG-01-20230817	JW-PDI-1101-SG-01-20230817	
Aroclor-1248	16.8	22.8	30
Aroclor-1254	13.8	13.9	1

X. Target Analyte Quantitation

The sample results for detected analytes from the two columns were within 40% relative percent difference (RPD) with the following exceptions:

Sample	Analyte	RPD	Flag	A or P
JW-PDI-1101-SG-01-20230817	Aroclor-1248	46.5	J (all detects)	A
JW-PDI-Drum2-20230817	Aroclor-1248	86.1	J (all detects)	A

Sample	Analyte	Finding	Criteria	Flag	A or P
JW-PDI-099-SG-01-20230817**	Aroclor-1254	2nd column confirmation was not performed for this analyte.	2nd column confirmation should be performed for all detected results.	NJ (all detects)	A

Sample	Analyte	Finding	Criteria	Flag	A or P
JW-PDI-100-SG-01-20230817	Aroclor-1260	2nd column confirmation was not performed for this analyte.	2nd column confirmation should be performed for all detected results.	NJ (all detects)	A

Raw data were not reviewed for Stage 2B validation.

XI. Target Analyte Identification

All target analyte identifications met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Data qualified due to RPD between two columns and 2nd column confirmation are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polychlorinated Biphenyls - Data Qualification Summary - SDG 23H0501

Sample	Analyte	Flag	A or P	Reason (Code)
JW-PDI-1101-SG-01-20230817 JW-PDI-Drum2-20230817	Aroclor-1248	J (all detects)	A	Target analyte quantitation (RPD between two columns) (12)
JW-PDI-099-SG-01-20230817**	Aroclor-1254	NJ (all detects)	A	Target analyte quantitation (2nd column confirmation) (12)
JW-PDI-100-SG-01-20230817	Aroclor-1260	NJ (all detects)	A	Target analyte quantitation (2nd column confirmation) (12)

Jeld-Wen
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG 23H0501

No Sample Data Qualified in this SDG

LDC #: 57832C3b
SDG #: 23H0501
Laboratory: Analytical Resources, Inc., Tukwila, WA

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/4

Date: 12/12/23
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC Polychlorinated Biphenyls (EPA SW-846 Method 8082A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A/A	%D RSD / ICV ±20
III.	Continuing calibration	A	CCV ±20
IV.	Laboratory Blanks	A	
V.	Field blanks	N	
VI.	Surrogate spikes 1/3	A/A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS 1D
IX.	Field duplicates	SW	D = 3,5
X.	Target analyte quantitation	SW	Not reviewed for Stage 2B validation.
XI.	Target analyte identification	A	Not reviewed for Stage 2B validation.
XII.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Indicates sample underwent Stage 4 validation

	Client ID	Lab ID	Matrix	Date
1	JW-PDI-099-SG-01-20230817**	23H0501-03**	Soil	08/17/23
2	JW-PDI-100-SG-01-20230817	23H0501-04	Soil	08/17/23
3	JW-PDI-101-SG-01-20230817 D	23H0501-07	Soil	08/17/23
4	JW-PDI-102-SG-01-20230817	23H0501-09	Soil	08/17/23
5	JW-PDI-1101-SG-01-20230817 D	23H0501-10	Soil	08/17/23
6	JW-PDI-Drum1-20230817	23H0501-11	Soil	08/17/23
7	JW-PDI-Drum2-20230817	23H0501-12	Soil	08/17/23
8	JW-PDI-100-SG-01-20230817MS	23H0501-04MS	Soil	08/17/23
9	JW-PDI-100-SG-01-20230817MSD	23H0501-04MSD	Soil	08/17/23
10				
11				
12				
13				

Notes:

	BL H0618						

LDC #: 57832 C3b

VALIDATION FINDINGS CHECKLIST

Method: ✓ GC ___ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
IIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥0.990?			✓	
Were the RT windows properly established?	✓			
IIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20%?	✓			
Were all the retention times within the acceptance windows?	✓			
IV. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks?		✓		
V. Field Blanks				
Were field blanks identified in this SDG?		✓		
Were target compounds detected in the field blanks?			✓	
VI. Surrogate spikes				
Were all surrogate percent recovery (%R) within the QC limits?	✓			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
VIII. Laboratory control samples				
Was an LCS analyzed per analytical or extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				

Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
X. Compound quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG. Chlordane
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH. Chlordane (Technical)
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II. Aroclor 1262
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ. Aroclor 1268
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. 2,4'-DDD	KK. Oxychlordane
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. 2,4'-DDE	LL. trans-Nonachlor
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE. 2,4'-DDT	MM. cis-Nonachlor
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF. Hexachlorobenzene	NN.

Notes:_____

LDC #: 57832c3b

VALIDATION FINDINGS WORKSHEET
Field Duplicates

METHOD: ✓ GC ___ HPLC

Y N N/A Were field duplicate pairs identified in this SDG?

Y N N/A Were target analytes detected in the field duplicate pairs?

Compound	Concentration (ng/kg)		%RPD Limit (≤ 30 %)	Qualification (Parent only)
	3	5		
Z	16.8	22.8	30	
AA	FT ~~9.9~~ 13.8	13.9	1	

Compound	Concentration ( )		%RPD Limit (≤_____%)	Qualification (Parent only)

Compound	Concentration ( )		%RPD Limit (≤_____%))	Qualification (Parent only)

LDC #: 57832c3b

VALIDATION FINDINGS WORKSHEET
Target Analyte Quantitation

Reviewer: FT

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

(12)

#	Associated Samples	Compound Name	% RPD Bet 2 col ≤ 40 Findings	Qualifications
	1	AA	Not ~~2nd~~ confirmed on 2nd column	NJ/A
	2	BB	↓	NJ/A
	5	Z	46.5	Jdw /A
	7	Z	86.1	Jdw /A

Comments: See sample calculation verification worksheet for recalculations

LDC #: 57832C3b

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT

METHOD: GC PCB (EPA SW 846 Method 8082)

The calibration factors (CF) and relative standard deviation (%RSD) were recalculated using the following calculations:

CF = A/C
Average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

Where: A = Area of compound
C = Concentration of compound
S = Standard deviation of calibration factors
X = Mean of calibration factors

#	Standard ID	Calibration Date	Compound	Reported RRF (250 ug/Ll std)	Recalculated RRF (250 ug/L std)	Reported Ave RRF(initial)	Recalculated Ave RRF(intial)	Reported %RSD	Recalculated %RSD
1	ICAL	08/19/23	PCB 1260-1 ZB5	4.235272e-2	4.2657719e-2	4.192872e-2	4.192872e-2	5.9	5.9
	GH0059		PCB 1260-1 ZB35	4.358216e-2	4.3896e-2	4.473978e-2	4.473978e-2	7.8	7.8
2									
3									
4									

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 57832 C3b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT

METHOD: GC ✓ HPLC _____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF -CF)/ave.CF

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(ICAL)/ CCV Conc.	Reported CF/ Conc. CCV	Recalculated CF/ Conc. CCV	Reported %D	Recalculated %D
1	SLI0054-ICV2	9/5/23 1422	Aroclor 1260-1 coll	250.0	255		2.0	
			↓ 2		265		6.0	
2								
3								
4								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 57832 c3b

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: FT

METHOD: ✓ GC __ HPLC

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #3

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
DCB	col 1	40.0	35.3	88.3	88.3	0
TCMX	" 1		32.9	82.3	82.3	
DCB	col 2		40.0	100	100	
TCMX	2	↓	33.5	83.7	83.7	↓

Sample ID: _____

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C`	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	Chloro-octadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-Dichlorophenylacetic acid
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate	CC	2,5-Dibromotoluene
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 57832c3b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FT

METHOD: ✓ GC ___ HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA

Where SSC = Spiked sample concentration; SC = Sample concentration; SA = Spike added; MS = Matrix spike; MSD = Matrix spike duplicate

RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100

MS/MSD samples: 8 + 9

Compound	Spike Added (ug/kg)		Sample Conc. (ug/kg)	Spike Sample Concentration (ug/kg)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	---	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
BB	500	500	10.8	402	403	78.2	78.2	78.4	78.4	0.345	0.345

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 57832C3b

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: FT

METHOD: ✓ **GC** ___ **HPLC**

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC/SA)
RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100

Where SSC = Spiked sample concentration; LCS = Laboratory Control Sample; SA = Spike added; LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples: BLH0618 - LCS 1D

Compound	Spike Added (ug/kg)		Spike Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Aroclor 1260	500	500	396	410	79.2	79.2	82.1	82.1	3.52	3.52

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

DC #: 57832C36

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: FT

METHOD: ✓ GC ___ HPLC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration= (A)(Fv)(Df) / (RF)(Vs or Ws)(%S/100)

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. #1 Compound Name Aroclor 1254

Concentration = (10.0116)(5) / (9.96)(0.50888) =

5/9.96
% S = 50.88

= 9.876 ug/kg

#	Sample ID	Compound	Reported Concentrations (ug/Kg)	Recalculated Results Concentrations (ug/Kg)	Qualifications
	#1	Aroclor 1254	9.9	9.876	
	1254-1 = (4749)(80) / (795931)(7.75118 x 10^-2)		1254-1 =	6.158	
			2 =	8.7	
			3 =	19.1	
	= 6.158		4 =	8.1	
			5 =	8.0	
				10.0116	

Comments: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: January 16, 2024

Parameters: Metals

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0501

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-PDI-Drum1-20230817	23H0501-11	Soil	08/17/23
JW-PDI-Drum2-20230817	23H0501-12	Soil	08/17/23
JW-PDI-Drum1-20230817MS	23H0501-11MS	Soil	08/17/23
JW-PDI-Drum1-20230817MSD	23H0501-11MSD	Soil	08/17/23
JW-PDI-Drum1-20230817DUP	23H0501-11DUP	Soil	08/17/23

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Metals by Environmental Protection Agency (EPA) SW 846 Method 6010D
Mercury by EPA SW 846 Methods 7471B

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Less than reporting limit
25 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Instrument Calibration

Initial and continuing calibrations were performed as required by the method.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

III. ICP Interference Check Sample Analysis

The frequency of interference check sample (ICS) analysis was met. All criteria were within QC limits.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Serial Dilution

Serial dilution was not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Target Analyte Quantitation

Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Jeld-Wen
Metals - Data Qualification Summary - SDG 23H0501

No Sample Data Qualified in this SDG

Jeld-Wen
Metals - Laboratory Blank Data Qualification Summary - SDG 23H0501

No Sample Data Qualified in this SDG

LDC #: 57832C4b

SDG #: 23H0501

Laboratory: Analytical Resources, Inc., Tukwila, WA

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

Date: 12/12/23

Page: 1 of 1

Reviewer: NF

2nd Reviewer: A

METHOD: Metals (EPA SW-846 Method 6010D/7471B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Instrument Calibration	A	
III.	ICP Interference Check Sample (ICS) Analysis	A	
IV.	Laboratory Blanks	A	
V.	Field Blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	A	
VII.	Duplicate sample analysis	A	
VIII.	Serial Dilution	N	
IX.	Laboratory control samples	A	LCS
X.	Field Duplicates	N	
XI.	Target Analyte Quantitation	N	
XII	Overall Assessment of Data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	JW-PDI-Drum1-20230817	23H0501-11	Soil	08/17/23
2	JW-PDI-Drum2-20230817	23H0501-12	Soil	08/17/23
3	JW-PDI-Drum1-20230817MS	23H0501-11MS	Soil	08/17/23
4	JW-PDI-Drum1-20230817DUP	23H0501-11DUP	Soil	08/17/23
5	JW-PDI-Drum1-20230817MSD	23H0501-11MSD	Soil	8/17/23
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

Notes:

Sample Specific Element Reference

All elements are applicable to each sample as noted below.

Sample ID	Target Analyte List
1-2	As, Ba, Cd, Cr, Pb, Hg, Se, Ag
QC	
3-4	As, Ba, Cd, Cr, Pb, Hg, Se, Ag
3-5	Hg

Analysis Method

ICP	As, Ba, Cd, Cr, Pb, Se, Ag
ICP-MS	
CVAA	Hg

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: January 16, 2024

Parameters: Wet Chemistry

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA/
Materials Testing & Consulting, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0501/23B014-23

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-PDI-108-SG-01-20230817	23H0501-02	Soil	08/17/23
JW-PDI-099-SG-01-20230817	23H0501-03	Soil	08/17/23
JW-PDI-100-SG-01-20230817	23H0501-04	Soil	08/17/23
JW-PDI-087-SG-01-20230817	23H0501-05	Soil	08/17/23
JW-PDI-088-SG-01-20230817	23H0501-06	Soil	08/17/23
JW-PDI-101-SG-01-20230817	23H0501-07	Soil	08/17/23
JW-PDI-089-SG-01-20230817	23H0501-08	Soil	08/17/23
JW-PDI-102-SG-01-20230817	23H0501-09	Soil	08/17/23
JW-PDI-1101-SG-01-20230817	23H0501-10	Soil	08/17/23
JW-PDI-108-SG-01-20230817DUP	23H0501-02DUP	Soil	08/17/23
JW-PDI-108-SG-01-20230817TRP	23H0501-02TRP	Soil	08/17/23

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Moisture Content by American Society for Testing and Material (ASTM) C556 and ASTM D2216
Organic Matter by ASTM D2974
Total Solids by ASTM D2216

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Less than reporting limit
25 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

Initial calibration analysis was not required by the methods.

III. Continuing Calibration

Continuing calibration frequency and analysis was not required by the methods.

IV. Laboratory Blanks

Laboratory blank analysis was not required by the methods.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the methods.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were not required by the methods.

IX. Field Duplicates

Samples JW-PDI-101-SG-01-20230817 and JW-PDI-1101-SG-01-20230817 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (%)		RPD
	JW-PDI-101-SG-01-20230817	JW-PDI-1101-SG-01-20230817	
Moisture content	104.5	103.3	1
Organic content	6.91	6.12	12
Total solids	47.26	48.42	2

X. Target Analyte Quantitation

Raw data were not reviewed for Stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Jeld-Wen
Wet Chemistry - Data Qualification Summary - SDG 23H0501/23B014-23

No Sample Data Qualified in this SDG

Jeld-Wen
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 23H0501/23B014-23

No Sample Data Qualified in this SDG

LDC #: 57832C6 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/12/23
SDG #: 23H0501/23B014-23 Stage 2B Page: 1 of 1
Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer: NF
Sub-Laboratory: Materials Testing & Consulting, Inc., Tukwila, WA 2nd Reviewer: JC

METHOD: (Analyte) Moisture Content (ASTM C556/ASTM D2216), Organic Matter (ASTM D2974), Total Solids (ASTM D2216)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II	Initial calibration	N	
III.	Calibration verification	N	
IV	Laboratory Blanks	N	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	N	
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	N	
IX.	Field duplicates	SW	FD=(6,9)
X.	Target Analyte Quantitation	N	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	JW-PDI-108-SG-01-20230817	23H0501-02	Soil	08/17/23
2	JW-PDI-099-SG-01-20230817	23H0501-03	Soil	08/17/23
3	JW-PDI-100-SG-01-20230817	23H0501-04	Soil	08/17/23
4	JW-PDI-087-SG-01-20230817	23H0501-05	Soil	08/17/23
5	JW-PDI-088-SG-01-20230817	23H0501-06	Soil	08/17/23
6	JW-PDI-101-SG-01-20230817	23H0501-07	Soil	08/17/23
7	JW-PDI-089-SG-01-20230817	23H0501-08	Soil	08/17/23
8	JW-PDI-102-SG-01-20230817	23H0501-09	Soil	08/17/23
9	JW-PDI-1101-SG-01-20230817	23H0501-10	Soil	08/17/23
10	JW-PDI-108-SG-01-20230817DUP	23H0501-02DUP	Soil	08/17/23
11	JW-PDI-108-SG-01-20230817TRP	23H0501-02TRP	Soil	08/17/23
12				
13				
14				
15				

Notes:

All elements are applicable to each sample as noted below.

Sample ID	Target Analyte List
1-9	Moisture Content, Organic Matter
2-3, 6-9	Total Solids
QC	
10-11	Moisture Content, Organic Matter

Field Duplicates

METHOD: Inorganics

Analyte	Concentration (%)		RPD
	6	9	
Moisture Content	104.5	103.3	1
Organic Content	6.91	6.12	12
Total Solids	47.26	48.42	2

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: December 19, 2023

Parameters: Polychlorinated Dioxins/Dibenzofurans

Validation Level: Stage 2B & 4

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0501

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-FB-01-20230817	23H0501-01	Water	08/17/23
JW-PDI-099-SG-01-20230817**	23H0501-03**	Soil	08/17/23
JW-PDI-100-SG-01-20230817	23H0501-04	Soil	08/17/23
JW-PDI-101-SG-01-20230817	23H0501-07	Soil	08/17/23
JW-PDI-089-SG-01-20230817	23H0501-08	Soil	08/17/23
JW-PDI-102-SG-01-20230817	23H0501-09	Soil	08/17/23
JW-PDI-1101-SG-01-20230817	23H0501-10	Soil	08/17/23
JW-PDI-Drum1-20230817	23H0501-11	Soil	08/17/23
JW-PDI-Drum2-20230817	23H0501-12	Soil	08/17/23
JW-PDI-100-SG-01-20230817DUP	23H0501-04DUP	Soil	08/17/23

**Indicates sample underwent Stage 4 validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for High Resolution Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Dioxins/Dibenzofurans by Environmental Protection Agency (EPA) Method 1613B

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Stage 4 data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25%.

The static resolving power was at least 10,000 (10% valley definition).

III. Initial Calibration and Initial Calibration Verification

A five point initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all analytes and less than or equal to 35.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The minimum S/N ratio was greater than or equal to 10 for each analyte and labeled compound associated to samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

The percent differences (%D) of the initial calibration verification (ICV) standard were within the QC limits for all analytes and labeled compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration results were within the QC limits for all analytes and labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The minimum S/N ratio was greater than or equal to 10 for each analyte and labeled compound associated to samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Analyte	Concentration	Associated Samples
BLH0631-BLK1	08/24/23	OCDF OCDD	5.53 pg/L 27.6 pg/L	All water samples in SDG 23H0501
BLI0069-BLK1	09/11/23	OCDF OCDD	1.59 ng/Kg 7.11 ng/Kg	All soil samples in SDG 23H0501

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration (pg/L)	Modified Final Concentration (pg/L)
JW-FB-01-20230817	OCDD	15.7	15.7U

VI. Field Blanks

Sample JW-FB-01-20230817 was identified as a field blank. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration (pg/L)
JW-FB-01-20230817	OCDD	15.7

VII. Matrix Spike/Matrix Spike Duplicates/Duplicate Sample Analysis

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples JW-PDI-101-SG-01-20230817 and JW-PDI-1101-SG-01-20230817 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/Kg)		RPD
	JW-PDI-101-SG-01-20230817	JW-PDI-1101-SG-01-20230817	
2,3,7,8-TCDF	1.21	1.29	6.4
2,3,7,8-TCDD	0.101U	0.315	NC
1,2,3,7,8-PeCDF	0.745	0.812	9
2,3,4,7,8-PeCDF	0.937	1.24	28
1,2,3,7,8-PeCDD	1.38	1.48	7
1,2,3,4,7,8-HxCDF	1.77	1.73	2
1,2,3,6,7,8-HxCDF	1.60	1.45	10
2,3,4,6,7,8-HxCDF	2.66	2.84	7
1,2,3,7,8,9-HxCDF	0.982	0.768	24
1,2,3,4,7,8-HxCDD	1.61	1.92	18
1,2,3,6,7,8-HxCDD	8.91	9.62	8
1,2,3,7,8,9-HxCDD	4.88	5.30	8
1,2,3,4,6,7,8-HpCDF	45.6	46.6	2
1,2,3,4,7,8,9-HpCDF	2.45	2.43	1
1,2,3,4,6,7,8-HpCDD	203	212	4
OCDF	95.6	95.2	0
OCDD	1700	1610	5
Total TCDF	9.55	8.39	13
Total TCDD	8.99	12.6	33
Total PeCDF	13.7	15.4	12
Total PeCDD	6.95	9.92	35
Total HxCDF	55.5	57.8	4
Total HxCDD	72.9	74.8	3
Total HpCDF	132	135	2
Total HpCDD	454	481	6

X. Labeled Compounds

All percent recoveries (%R) for labeled compounds used to quantitate target analytes were within QC limits.

XI. Target Analyte Quantitation

All target analyte quantitations were within validation criteria with the following exceptions:

Sample	Analyte	Flag	A or P
All soil samples in SDG 23H0501	All analytes reported by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A

Raw data were not reviewed for Stage 2B validation.

XII. Target Analyte Identification

All target analyte identifications met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Data qualified due to results reported by the laboratory as EMPCs and laboratory blank contamination are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Data Qualification Summary - SDG 23H0501

Sample	Analyte	Flag	A or P	Reason (Code)
JW-PDI-099-SG-01-20230817** JW-PDI-100-SG-01-20230817 JW-PDI-101-SG-01-20230817 JW-PDI-089-SG-01-20230817 JW-PDI-102-SG-01-20230817 JW-PDI-1101-SG-01-20230817 JW-PDI-Drum1-20230817 JW-PDI-Drum2-20230817	All analytes reported by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A	Target analyte quantitation (EMPC) (23)

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG 23H0501

Sample	Analyte	Modified Final Concentration (pg/L)	A or P	Code
JW-FB-01-20230817	OCDD	15.7U	A	7

LDC #: 57832C21 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/12/23
SDG #: 23H0501 Stage 2B/4 Page: 1 of 1
Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: HRGC/HRMS Polychlorinated Dioxins/Dibenzofurans (EPA Method 1613B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A A	
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration/ICV	A A	%D/RSD ≤ 20/35 ICV = QC limit
IV.	Continuing calibration	A	CCV = QC limit
V.	Laboratory Blanks	SW	
VI.	Field blanks	SW	FB = 1
VII.	Matrix spike/Matrix spike duplicates 1 DUP	N/A	< 5X RL
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	SW	D = 4, 7
X.	Labeled Compounds	A	
XI.	Target analyte quantitation	SW	Not reviewed for Stage 2B validation.
XII.	Target analyte identification	A	Not reviewed for Stage 2B validation.
XIII.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Stage 4 validation

	Client ID	Lab ID	Matrix	Date
1 1	JW-FB-01-20230817	23H0501-01	Water	08/17/23
2 2	JW-PDI-099-SG-01-20230817**	23H0501-03**	Soil	08/17/23
3	JW-PDI-100-SG-01-20230817	23H0501-04	Soil	08/17/23
4	JW-PDI-101-SG-01-20230817 D	23H0501-07	Soil	08/17/23
5	JW-PDI-089-SG-01-20230817	23H0501-08	Soil	08/17/23
6	JW-PDI-102-SG-01-20230817	23H0501-09	Soil	08/17/23
7	JW-PDI-1101-SG-01-20230817 D	23H0501-10	Soil	08/17/23
8	JW-PDI-Drum1-20230817	23H0501-11	Soil	08/17/23
9	JW-PDI-Drum2-20230817	23H0501-12	Soil	08/17/23
10	JW-PDI-100-SG-01-20230817DUP	23H0501-04DUP	Soil	08/17/23
11				

Notes:

1	BLH0631						
2	BLI0069						

Lab dup limits - ± 35% was used

LDC #: 57832C21 **VALIDATION FINDINGS CHECKLIST** Page: 1 of 2
Reviewer: FT

Method: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Was PFK exact mass 380.9760 verified?	✓			
Were the retention time windows established for all homologues?	✓			
Was the chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomers ≤ 25% ?	✓			
Is the static resolving power at least 10,000 (10% valley definition)?	✓			
Was the mass resolution adequately check with PFK?	✓			
Was the presence of 1,2,8,9-TCDD and 1,3,4,6,8-PeCDF verified?	✓			
IIIa. Initial calibration				
Was the initial calibration performed at 5 concentration levels?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20% for unlabeled compounds and ≤ 35% for unlabeled compounds?	✓			
Did all calibration standards meet the Ion Abundance Ratio criteria?	✓			
Was the signal to noise ratio for each target compound and labeled compound ≥ 10?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all concentrations for the unlabeled compounds and for labeled compounds within QC limits?	✓			
IV. Continuing calibration				
Was a continuing calibration performed at the beginning and end of each 12 hour period?	✓			
Were all concentrations for the unlabeled compounds and for labeled compounds within QC limits?	✓			
Did all continuing calibration standards meet the Ion Abundance Ratio criteria?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank performed for each matrix and whenever a sample extraction was performed?	✓			
Was there contamination in the method blanks?	✓			
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?	✓			
VII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?			✓	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	

Validation Area	Yes	No	NA	Findings/Comments
VIII. Laboratory control samples				
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
X. Labeled Compounds				
Were labeled compounds within the 25-150% criteria?	✓			
Was the minimum S/N ratio of all labeled compound peaks ≥ 10?	✓			
XI. Compound quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XII. Target compound identification				
For 2,3,7,8 substituted congeners with associated labeled standards, were the retention times of the two quantitation peaks within -1 to 3 sec. of the RT of the labeled standard?	✓			
For 2,3,7,8 substituted congeners without associated labeled standards, were the relative retention times of the two quantitation peaks within 0.005 time units of the RRT measured in the routine calibration?	✓			
For non-2,3,7,8 substituted congeners, were the retention times of the two quantitation peaks within RT established in the performance check solution?	✓			
Did compound spectra contain all characteristic ions listed in the table attached?	✓			
Was the Ion Abundance Ratio for the two quantitation ions within criteria?	✓			
Was the signal to noise ratio for each target compound ≥2.5 and ≥10 for the labeled compound?	✓			
Does the maximum intensity of each specified characteristic ion coincide within ± 2 seconds (includes labeled standards)?	✓			
For PCDF identification, was any signal (S/N ≥ 2.5, at ± seconds RT) detected in the corresponding PCDPE channel?	✓			
Was an acceptable lock mass recorded and monitored?	✓			
XIII. System performance				
System performance was found to be acceptable.	✓			
XIV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

A. 2,3,7,8-TCDD	F. 1,2,3,4,6,7,8-HpCDD	K. 1,2,3,4,7,8-HxCDF	P. 1,2,3,4,7,8,9-HpCDF	U. Total HpCDD
B. 1,2,3,7,8-PeCDD	G. OCDD	L. 1,2,3,6,7,8-HxCDF	Q. OCDF	V. Total TCDF
C. 1,2,3,4,7,8-HxCDD	H. 2,3,7,8-TCDF	M. 2,3,4,6,7,8-HxCDF	R. Total TCDD	W. Total PeCDF
D. 1,2,3,6,7,8-HxCDD	I. 1,2,3,7,8-PeCDF	N. 1,2,3,7,8,9-HxCDF	S. Total PeCDD	X. Total HxCDF
E. 1,2,3,7,8,9-HxCDD	J. 2,3,4,7,8-PeCDF	O. 1,2,3,4,6,7,8-HpCDF	T. Total HxCDD	Y. Total HpCDF

Notes:_____

LDC #: 57832c21

VALIDATION FINDINGS WORKSHEET
Blanks

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(7)

X N N/A Were all samples associated with a method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
Y N N/A Was the method blank contaminated?

Blank extraction date: 8/24/23 **Blank analysis date:** 10/20/23 **Associated samples:** all water

Conc. units: pg/L

Compound	Blank ID	Sample Identification								
	BLH0623-BLK1	1								
Q	5.53	-								
G	27.6	15.7 U								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 57832C21

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: FT

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a method blank?

Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?

Y N N/A Was the method blank contaminated?

Blank extraction date: 9/11/23 **Blank analysis date:** 10/23/23 **Associated samples:** All SOILS 75X

Conc. units: ng/kg

Compound	Blank ID	5X	Sample Identification						
	BLI0069-BLK1								
Q	1.59	7.95							
G	7.11	35.55							

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 57832C21

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: JF

METHOD: 1613B

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds detected in the field blanks?

(6)

Sample: #1 = FB Field Blank / Rinsate Blank/ Equipment Blank / Rinsate (circle one)

Compound	Concentration Units (pg/L)
G	15.7

Sample: _____ Field Blank / Rinsate Blank/ Equipment Blank / Rinsate (circle one)

Compound	Concentration Units ( )

LDC#:57832C21 **VALIDATION FINDINGS WORKSHEET** Page:_1__of_1__
Field Duplicates Reviewer:__FT____

METHOD: (EPA Method 1613B)

Compound	Concentration (ng/kg)		RPD
	4	7	
H	1.21	1.29	6.4
A	0.101U	0.315	NC
I	0.745	0.812	9
J	0.937	1.24	28
B	1.38	1.48	7
K	1.77	1.73	2
L	1.60	1.45	10
M	2.66	2.84	7
N	0.982	0.768	24
C	1.61	1.92	18
D	8.91	9.62	8
E	4.88	5.30	8
O	45.6	46.6	2
P	2.45	2.43	1
F	203	212	4
Q	95.6	95.2	0
G	1700	1610	5
V	9.55	8.39	13
R	8.99	12.6	33
W	13.7	15.4	12
S	6.95	9.92	35
X	55.5	57.8	4
T	72.9	74.8	3
Y	132	135	2
U	454	481	6

LDC #: 57832c21

VALIDATION FINDINGS WORKSHEET
Target Analyte Quantitation and Reported CRQLs

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

(23)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the compound?
Y N N/A Compound quantitation and CRQLs were adjusted to reflect all sample dilutions and dry weight factors (if necessary).

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		All soils	All analytes qualified as EMPC by the lab		J det /A

Comments: See sample calculation verification worksheet for recalculations

LDC #: 57832C21

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs,

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard
X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported RRF (CS3 std) 10/50/100	Recalculated RRF (CS3 std)	Reported %RSD	Recalculated %RSD
1	ICAL	081123	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.9031472	0.9031472	0.8956648	0.8956648	1.2	1.2
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.242982	1.242982	1.171298	1.171298	3.8	3.8
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	0.8826935	0.8826935	0.9220737	0.9220737	4.4	4.4
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	1.199603	1.199603	1.184304	1.184304	12.2	12.2
			OCDF (^{13}C-OCDD)	1.130205	1.130205	1.104526	1.104526	12.7	12.7
2			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)						
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)						
			OCDF (^{13}C-OCDD)						
3			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)						
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)						
			OCDF (^{13}C-OCDD)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 57832C21

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	True amount	Reported Amount (CC)	Recalculated Amount (CC)	Reported %D	Recalculated %D
1	52J0386-1CV1	10/25/23 1029	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	10.0	10.5	10.5	5.0	5.0
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	10.0	8.89	8.89	11.1	11.1
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	50.0	50.2	50.2	0.4	0.4
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	50.0	46.8	46.8	6.3	6.3
			OCDF (^{13}C-OCDD)	100	104	104	4.2	4.2
2			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)					
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)					
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)					
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)					
			OCDF (^{13}C-OCDD)					
3			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)					
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)					
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)					
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)					
			OCDF (^{13}C-OCDD)					

Comments: Refer to Routine Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 57832C21

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: FT

METHOD: GC/MS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration
SA = Spike added

RPD = I LCS - LCSD I * 2/(LCS + LCSD) LCS = Laboraotry control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS ID: FT ~~BLH0631~~ - LCS
BLI0069

Compound	Spike Added (ng/kg)		Spiked Sample Concentration (ng/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalc
2,3,7,8-TCDD	20	NA	19.2	NA	96.0	96.0				
1,2,3,7,8-PeCDD	100	↓	~~92.~~ 92.1	↓	92.1	92.1				
1,2,3,4,7,8-HxCDD	100		86.6		86.6	86.6				
1,2,3,4,7,8,9-HpCDF	100		113		113	113				
OCDF	200	↓	200	↓	99.8	100				

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 57832c2)

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

RRF = Relative Response Factor (average) from the initial calibration

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only. 20/19.98

Example:

Sample I.D. #2, OCDF

Conc. = $\frac{(5.316\times10^4 + 5.869\times10^4)(200)(20)\left(\frac{1}{0.5004}\right)}{(3.463\times10^5 + 3.852\times10^5)(1.130)(19.98)}$

=

= 54.136 ng/kg

#	Sample ID	Compound (%S = 50.0)	Reported Concentration (ng/kg)	Calculated Concentration (ng/kg)	Qualification
	#2	OCDF	54.1	54.136	

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Anchor QEA, LLC
1201 Third Ave. Suite 2600
Seattle, WA 98101
ATTN: Ms. Delaney Peterson
dpeterson@anchorqea.com

February 7, 2024

SUBJECT: Jeld-Wen - Data Validation

Dear Ms. Peterson,

Enclosed are the final validation reports for the fractions listed below. This SDG was received on October 23, 2023. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #57784_RV1:

SDG #	**Fraction**
23H0059	Polynuclear Aromatic Hydrocarbons, Polychlorinated Biphenyls, Wet Chemistry, Polychlorinated Dioxins/Dibenzofurans

The data validation was performed under Stage 2B & 4 guidelines. The analysis was validated using the following documents, as applicable to each method:

- Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023)
- USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020)
- USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (November 2020)
- USEPA National Functional Guidelines (NFG) for High Resolution Superfund Methods Data Review (November 2020)
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Stella Cuenco
scuenco@lab-data.com
Project Manager/Senior Chemist

Stage 2B (PCB & Diox 90/10) EDD

LDC# 57784 (Anchor Environmental-Seattle WA / Jeld-Wen)

LDC	SDG#	DATE REC'D	(3) DATE DUE	PAHs (8270E -SIM)		PCBs (8082A)		Dioxins (1613B)		Moist. Content (D2216)		Org. Matter (D2974)		Total Solids (D2216)																							
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	23H0059	10/23/23	11/13/23	2	8	2	5	2	8	0	13	0	13	0	8																				
A	23H0059	10/23/23	11/13/23	0	0	0	1	0	1	0	0	0	0	0	0																				
Total	TR/SC			2	8	2	6	2	9	0	13	0	13	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	63

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS, MSD, or DUP's.

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: February 7, 2024

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0059

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-RB-01-20230802	23H0059-01	Water	08/02/23
JW-PDI-033-SG-0-1-20230802	23H0059-03	Soil	08/02/23
JW-PDI-053-SG-0-1-20230802	23H0059-04	Soil	08/02/23
JW-PDI-055-SG-0-1-20230802	23H0059-05	Soil	08/02/23
JW-PDI-115-SG-0-1-20230802	23H0059-06	Soil	08/02/23
JW-PDI-052-SG-0-1-20230802	23H0059-07	Soil	08/02/23
JW-PDI-035-SG-0-1-20230802	23H0059-09	Soil	08/02/23
JW-PDI-032-SG-0-1-20230802	23H0059-12	Soil	08/02/23
JW-RB-02-20230802	23H0059-14	Water	08/02/23
JW-PDI-051-SG-0-1-20230802	23H0059-16	Soil	08/02/23
JW-PDI-053-SG-0-1-20230802MS	23H0059-04MS	Soil	08/02/23
JW-PDI-053-SG-0-1-20230802MSD	23H0059-04MSD	Soil	08/02/23

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270E in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check was performed at the required frequency.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For analytes where average relative response factors (RRFs) were utilized, percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the analytes, all coefficients of determination (r^2) were greater than or equal to 0.990.

Average relative response factors (RRF) for all analytes were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all analytes.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all analytes with the following exceptions:

Date	Analyte	%D	Associated Samples	Flag	A or P
09/12/23	Benzo(k)fluoranthene	25.2	JW-PDI-053-SG-0-1-20230802 JW-PDI-115-SG-0-1-20230802 JW-PDI-051-SG-0-1-20230802	J (all detects)	A
09/13/23	Acenaphthylene Benzo(k)fluoranthene	24.0 22.4	JW-PDI-033-SG-0-1-20230802 JW-PDI-055-SG-0-1-20230802 JW-PDI-052-SG-0-1-20230802 JW-PDI-035-SG-0-1-20230802 JW-PDI-032-SG-0-1-20230802	J (all detects) J (all detects)	A

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Analyte	Concentration (ug/Kg)	Associated Samples
BLHD145-BLK1	08/07/23	Naphthalene 2-Methylnaphthalene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene	1.15 0.20 0.07 0.27 0.09 0.27 0.24 0.09 0.14 0.09	All soil samples in SDG 23H0059

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration (ug/Kg)	Modified Final Concentration (ug/Kg)
JW-PDI-033-SG-0-1-20230802 (5X)	Naphthalene	24.6	24.6U
JW-PDI-052-SG-0-1-20230802 (10X)	Naphthalene 2-Methylnaphthalene	33.0 8.68	33.0U 8.68U
JW-PDI-035-SG-0-1-20230802 (10X)	Naphthalene	39.9	39.9U
JW-PDI-032-SG-0-1-20230802 (5X)	Naphthalene	25.4	25.4U

VI. Field Blanks

Samples JW-RB-01-20230802 and JW-RB-02-20230802 were identified as rinse blanks. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration (ug/L)
JW-RB-01-20230802	Naphthalene	0.006

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Surrogate	%R (Limits)	Affected Analyte	Flag	A or P
JW-RB-02-20230802	2-Methylnaphthalene Fluoranrthene-d10	39.5 (42-120) 51.3 (57-120)	All analytes	UJ (all non-detects)	P

Surrogate recoveries (%R) were not within QC limits for sample JW-PDI-035-SG-0-1-20230802. Using professional judgment, no data were qualified when one surrogate %R was outside the QC limits and the %R was greater than or equal to 10%.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (50-150)	MSD (%R) (50-150)	Flag	A or P
JW-PDI-053-SG-0-1-20230802MS/MSD (JW-PDI-053-SG-0-1-20230802)	Naphthalene	41.3	-	J (all detects)	A
	2-Methylnaphthalene	45.4	-	J (all detects)	
	1-Methylnaphthalene	46.6	-	J (all detects)	
	Acenaphthylene	47.9	-	J (all detects)	
	Chrysene	24.4	27.4	J (all detects)	
	Benzo(b)fluoranthene	43.6	-	J (all detects)	
	Benzo(a)pyrene	35.3	40.9	J (all detects)	

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	RPD (≤35)	Flag	A or P
JW-PDI-053-SG-0-1-20230802MS/MSD (JW-PDI-053-SG-0-1-20230802)	Naphthalene	43.9	J (all detects)	A
	2-Methylnaphthalene	35.9	J (all detects)	
	1-Methylnaphthalene	42.7	J (all detects)	

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Target Analyte Quantitation

Raw data were not reviewed for Stage 2B validation.

XIII. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Data qualified due to continuing calibration %D, surrogate %R, MS/MSD %R and RPD, and laboratory blank contamination are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 23H0059

Sample	Analyte	Flag	A or P	Reason (Code)
JW-PDI-053-SG-0-1-20230802 JW-PDI-115-SG-0-1-20230802 JW-PDI-051-SG-0-1-20230802	Benzo(k)fluoranthene	J (all detects)	A	Continuing calibration (%D) (5)
JW-PDI-033-SG-0-1-20230802 JW-PDI-055-SG-0-1-20230802 JW-PDI-052-SG-0-1-20230802 JW-PDI-035-SG-0-1-20230802 JW-PDI-032-SG-0-1-20230802	Acenaphthylene Benzo(k)fluoranthene	J (all detects) J (all detects)	A	Continuing calibration (%D) (5)
JW-RB-02-20230802	All analytes	UJ (all non-detects)	P	Surrogates (%R) (13)
JW-PDI-053-SG-0-1-20230802	Naphthalene 2-Methylnaphthalene 1-Methylnaphthalene Acenaphthylene Chrysene Benzo(b)fluoranthene Benzo(a)pyrene	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (8)
JW-PDI-053-SG-0-1-20230802	Naphthalene 2-Methylnaphthalene 1-Methylnaphthalene	J (all detects) J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (RPD) (9)

Jeld-Wen
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 23H0059

Sample	Analyte	Modified Final Concentration (ug/Kg)	A or P	Code
JW-PDI-033-SG-0-1-20230802 (5X)	Naphthalene	24.6U	A	7
JW-PDI-052-SG-0-1-20230802 (10X)	Naphthalene 2-Methylnaphthalene	33.0U 8.68U	A	7
JW-PDI-035-SG-0-1-20230802 (10X)	Naphthalene	39.9U	A	7
JW-PDI-032-SG-0-1-20230802 (5X)	Naphthalene	25.4U	A	7

LDC #: 57784A2b **VALIDATION COMPLETENESS WORKSHEET** Date: 12/08/23
SDG #: 23H0059 Stage 2B Page: 1 of 1
Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer: JW
2nd Reviewer: A

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW-846 Method 8270E-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	RSD ≤ 20% r ICV ≤ 30%
IV.	Continuing calibration	SW	%D ≤ 20%
V.	Laboratory Blanks	SW	
VI.	Field blanks	SW	RB = 1, 9*
VII.	Surrogate spikes	SW	
VIII.	Matrix spike/Matrix spike duplicates	SW	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Target analyte quantitation	N	
XIII.	Target analyte identification	N	
XIV	Overall assessment of data	A	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
* ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank
SB=Source blank
OTHER:

	Client ID	Lab ID	Matrix	Date
1	JW-RB-01-20230802	23H0059-01	Water	08/02/23
2	JW-PDI-033-SG-0-1-20230802	23H0059-03	Soil	08/02/23
3	JW-PDI-053-SG-0-1-20230802	23H0059-04	Soil	08/02/23
4	JW-PDI-055-SG-0-1-20230802	23H0059-05	Soil	08/02/23
5	JW-PDI-115-SG-0-1-20230802	23H0059-06	Soil	08/02/23
6	JW-PDI-052-SG-0-1-20230802	23H0059-07	Soil	08/02/23
7	JW-PDI-035-SG-0-1-20230802	23H0059-09	Soil	08/02/23
8	JW-PDI-032-SG-0-1-20230802	23H0059-12	Soil	08/02/23
9	JW-RB-02-20230802	23H0059-14	Water	08/02/23
10	JW-PDI-051-SG-0-1-20230802	23H0059-16	Soil	08/02/23
11	JW-PDI-053-SG-0-1-20230802MS	23H0059-04MS	Soil	08/02/23
12	JW-PDI-053-SG-0-1-20230802MSD	23H0059-04MSD	Soil	08/02/23
13				
14				
15	BLH0171-BLK1			

+ 2 BLH0145-1

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	GG. Acenaphthene	MMM. Bis(2-Chloroisopropyl)ether	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	Y1. 3,3'-Dimethylbenzidine
B. Bis (2-chloroethyl) ether	HH. 2,4-Dinitrophenol	NNN. Aniline	TTTT. 1-Methyldibenzothiophene (1MDT)	Z1. o-Toluidine
C. 2-Chlorophenol	II. 4-Nitrophenol	OOO. N-Nitrosodimethylamine	UUUU.. 2,3,4,6-Tetrachlorophenol	A2. Benzo(j)fluoranthene
D. 1,3-Dichlorobenzene	JJ. Dibenzofuran	PPP. Benzoic Acid	VVVV. 1,2,4,5-Tetrachlorobenzene	B2. Benzofluoranthenes, total
E. 1,4-Dichlorobenzene	KK. 2,4-Dinitrotoluene	QQQ. Benzyl alcohol	WWWW.. 2-Picoline	C2. trans-Decalin
F. 1,2-Dichlorobenzene	LL. Diethylphthalate	RRR. Pyridine	XXXX. 3-Methylcholanthrene	D2. cis-Decalin
G. 2-Methylphenol	MM. 4-Chlorophenyl-phenyl ether	SSS. Benzidine	YYYY. a,a-Dimethylphenethylamine	E2. Dibenzo(a)anthracenes
H. 2,2'-Oxybis(1-chloropropane)	NN. Fluorene	TTT. 1-Methylnaphthalene	ZZZZ. Hexachloropropene	F2. Benzo(j)+(k)fluoranthene
I. 4-Methylphenol	OO. 4-Nitroaniline	UUU.Benzo(b)thiophene	A1. N-Nitrosodiethylamine	G2. Dibenzo(ah)+(ac)anthracene
J. N-Nitroso-di-n-propylamine	PP. 4,6-Dinitro-2-methylphenol	VVV.Benzonaphthothiophene	B1. N-Nitrosodi-n-butylamine	H2. Bis(2-ethylhexyl)adipate
K. Hexachloroethane	QQ. N-Nitrosodiphenylamine	WWW.Benzo(e)pyrene	C1. N-Nitrosomethylethylamine	I2. p-Chloro-m-cresol
L. Nitrobenzene	RR. 4-Bromophenyl-phenylether	XXX. 2,6-Dimethylnaphthalene	D1. N-Nitrosomorpholine	J2.
M. Isophorone	SS. Hexachlorobenzene	YYY. 2,3,5-Trimethylnaphthalene	E1. N-Nitrosopyrrolidine	K2.
N. 2-Nitrophenol	TT. Pentachlorophenol	ZZZ. Perylene	F1. Phenacetin	L2.
O. 2,4-Dimethylphenol	UU. Phenanthrene	AAAA. Dibenzothiophene	G1. 2-Acetylaminofluorene	M2.
P. Bis(2-chloroethoxy)methane	VV. Anthracene	BBBB. Benzo(a)fluoranthene	H1. Pronamide	N2.
Q. 2,4-Dichlorophenol	WW. Carbazole	CCCC. Benzo(b)fluorene	I1. Methyl methanesulfonate	O2.
R. 1,2,4-Trichlorobenzene	XX. Di-n-butylphthalate	DDDD. cis/trans-Decalin	J1. Ethyl methanesulfonate	P2.
S. Naphthalene	YY. Fluoranthene	EEEE. Biphenyl	K1. o,o',o''-Triethylphosphorothioate	Q2.
T. 4-Chloroaniline	ZZ. Pyrene	FFFF. Retene	L1. n-Phenylene diamine	R2.
U. Hexachlorobutadiene	AAA. Butylbenzylphthalate	GGGG. C30-Hopane	M1. 1,4-Naphthoquinone	S2.
V. 4-Chloro-3-methylphenol	BBB. 3,3'-Dichlorobenzidine	HHHH. 1-Methylphenanthrene	N1. N-Nitro-o-toluidine	T2.
W. 2-Methylnaphthalene	CCC. Benzo(a)anthracene	IIII. 1,4-Dioxane	O1. 1,3,5-Trinitrobenzene	U2.
X. Hexachlorocyclopentadiene	DDD. Chrysene	JJJJ. Acetophenone	P1. Pentachlorobenzene	V2..
Y. 2,4,6-Trichlorophenol	EEE. Bis(2-ethylhexyl)phthalate	KKKK. Atrazine	Q1. 4-Aminobiphenyl	W2
Z. 2,4,5-Trichlorophenol	FFF. Di-n-octylphthalate	LLLL. Benzaldehyde	R1. 2-Naphthylamine	X2..
AA. 2-Chloronaphthalene	GGG. Benzo(b)fluoranthene	MMMM. Caprolactam	S1. Triphenylene	Y2.
BB. 2-Nitroaniline	HHH. Benzo(k)fluoranthene	NNNN. 2,6-Dichlorophenol	T1. Octachlorostyrene	Z2.
CC. Dimethylphthalate	III. Benzo(a)pyrene	OOOO. 1,2-Diphenylhydrazine	U1. Famphur	
DD. Acenaphthylene	JJJ. Indeno(1,2,3-cd)pyrene	PPPP. 3-Methylphenol	V1. 1,4-phenylenediamine	
EE. 2,6-Dinitrotoluene	KKK. Dibenz(a,h)anthracene	QQQQ. 3&4-Methylphenol	W1. Methapyrilene	
FF. 3-Nitroaniline	LLL. Benzo(g,h,i)perylene	RRRR. 4-Dimethyldibenzothiophene	X1. Pentachloroethane	

LDC #: 57784 A 26

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: JVG

METHOD: GC/MS SVOA (EPA SW 846 Method 8270-SIM)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

Y (N) N/A Were percent differences (%D) ≤20 % and relative response factors (RRF) within the method criteria?

#	Date	Standard ID	Compound	Finding %D (Limit: <20.0%)	Finding RRF (Limit)	Associated Samples	Qualifications
	9/12/23	NT18230912-08	~~GGG~~ HHH (+)	25.2		3, 5, 10, 11, 12, MB2 (Det)	J detn/A (5)
	09/13/23	NT18 2309/1302	DD (+)	24.0		2, 4, 6-8, (Det)	J detn A (5)
			HHH (+)	22.4			

LDC #: 57784 A26

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: JVG

METHOD: GC/MS SVOA (EPA SW 846 Method 8270-SIM)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 08/07/23 **Blank analysis date:** 09/12/23

Conc. units: ug/Kg Associated Samples: All S Code: 7

Compound	Blank ID								
	BLHD145-	Blk 2 (5X)	4 (5X)	6 (10X)	7 (10X)	8 (5X)			
S	1.15	5.75	24.6 / U	33.0 / U	39.9 / U	25.4 / U			
W	0.20	1.0		8.68 / ↓					
NN	0.07	0.35							
UU	0.27	1.35							
VV	0.09	0.45							
YY	0.27	1.35							
ZZ	0.24	1.20							

Blank extraction date: ↓ **Blank analysis date:** ↓

Conc. units: ↓ Associated Samples: ↓

Compound	Blank ID								
↓	↓	↓							
CCC	0.09	0.45							
DDD	0.14	0.70							
GGG	0.09	0.45							

LDC #: 57784A2b

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: JVG

METHOD: GC/MS PAH (EPA SW 846 Method 8270E-SIM)

(Y) N N/A Were field blanks identified in this SDG?
Y (N) N/A Were target analytes detected in the field blanks?

Sample: 1 Rinse Blank

Analytes	Concentration Units (ug/L)
S	0.006

Sample: _____ Field Blank / Rinsate Blank/ Equipment Blank / Rinsate (circle one)

Analytes	Concentration Units (ug/L)

LDC #: 57784A26

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Reviewer: JVG

METHOD: GC/MS SVOA (EPA SW 846 Method 8270-SIM)

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Were percent recoveries (%R) for surrogates within QC limits?

Y (N) N/A If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?

Y N (N/A) If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Sample ID	Surrogate	%R (Limits)	Qualifications
	9 (MD)	2MN	39.5 (42-120)	J/UJ/P (13)
		FLN	51.3 (57-120)	
			( )	
			( )	
			( )	
(10X)	7	RKK-d14	0 (30-160)	NQ (d11)
			( )	
			( )	
			( )	
			( )	
			( )	
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			( )	
			( )	

(NBZ) = Nitrobenzene-d5
(FBP) = 2-Fluorobiphenyl
(TPH) = Terphenyl-d14
(PHL) = Phenol-d5
(2FP)= 2-Fluorophenol
(TBP) = 2,4,6-Tribromophenol
(2CP) = 2-Chlorophenol-d4
(DCB) = 1,2-Dichlorobenzene-d4
(2MN) = 2-Methylnaphthalene-d10
(FLN) = Fluoranthene-d10
(MNP) = 1-Methylnaphthalene=d10
(BAP) = Benzo(a)pyrene-d12

LDC #: 57784 A26

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: JVG

METHOD: GC/MS PAH (EPA SW 846 Method 8270-SIM)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?

Y (N) N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R	MSD %R	%R Limits	RPD (Limits)	Associated Samples	Qualifications
	11/12	S	41.3		50-150	( )	3 (Det)	J/UJ/A (8)
		W	45.7			( )		
		TTT	46.6			( )		
		DD	47.9			( )		
		DDD	24.4	27.4		( )		
		GGG	43.6			( )		
		III	35.3	40.9		( )		
		S				43.9 (35)		J dets/A (9)
		W				35.9 ( )		
		TTT				42.7 ( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
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						( )		
						( )		

LDC Report# 57784A3b

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: December 11, 2023

Parameters: Polychlorinated Biphenyls

Validation Level: Stage 2B & 4

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0059

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-RB-01-20230802	23H0059-01	Water	08/02/23
JW-PDI-053-SG-0-1-20230802	23H0059-04	Soil	08/02/23
JW-PDI-055-SG-0-1-20230802	23H0059-05	Soil	08/02/23
JW-PDI-115-SG-0-1-20230802	23H0059-06	Soil	08/02/23
JW-PDI-052-SG-0-1-20230802**	23H0059-07**	Soil	08/02/23
JW-PDI-035-SG-0-1-20230802	23H0059-09	Soil	08/02/23
JW-RB-02-20230802	23H0059-14	Water	08/02/23
JW-PDI-051-SG-0-1-20230802	23H0059-16	Soil	08/02/23
JW-PDI-052-SG-0-1-20230802MS	23H0059-07MS	Soil	08/02/23
JW-PDI-052-SG-0-1-20230802MSD	23H0059-07MSD	Soil	08/02/23

**Indicates sample underwent Stage 4 validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Stage 4 data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

NJ (Presumptive and estimated): The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all analytes.

Retention time windows were established as required by the method for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all analytes.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all analytes.

Retention times of all analytes in the calibration standards were within the established retention time windows for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Surrogates/Internal Standards

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Column	Surrogate	%R (Limits)	Affected Analyte	Flag	A or P
JW-RB-01-20230802	Col. 1	Decachlorobiphenyl Tetrachloro-m-xylene	9.45 (26-120) 15.0 (39-120)	All analytes	UJ (all non-detects)	P

All internal standard areas and retention times were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Analyte	LCS %R (60-140)	LCSD %R (60-140)	Affected Analyte	Flag	A or P
BLH0173-BS1/BSD1 (JW-RB-01-20230802 JW-RB-02-20230802)	Aroclor-1016 Aroclor-1260	45.4 46.5	57.2 -	All analytes	UJ (all non-detects)	P

Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Target Analyte Quantitation

All target analyte quantitations met validation criteria for samples which underwent Stage 4 validation.

The sample results for detected analytes from the two columns were within 40% relative percent difference (RPD) with the following exceptions:

Sample	Analyte	RPD	Flag	A or P
JW-PDI-053-SG-0-1-20230802	Aroclor-1260	55.1	J (all detects)	A
JW-PDI-055-SG-0-1-20230802	Aroclor-1248 Aroclor-1254	41.9 47.8	J (all detects) J (all detects)	A
JW-PDI-115-SG-0-1-20230802	Aroclor-1248	89.6	J (all detects)	A
JW-PDI-035-SG-0-1-20230802	Aroclor-1248	48.8	J (all detects)	A
JW-PDI-051-SG-0-1-20230802	Aroclor-1248	54.7	J (all detects)	A

Raw data were not reviewed for Stage 2B validation.

XI. Target Analyte Identification

All target analyte identifications met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Data qualified due to surrogate %R, LCS/LCSD %R, and RPD between two columns are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polychlorinated Biphenyls - Data Qualification Summary - SDG 23H0059

Sample	Analyte	Flag	A or P	Reason (Code)
JW-RB-01-20230802	All analytes	UJ (all non-detects)	P	Surrogates (%R) (13)
JW-RB-01-20230802 JW-RB-02-20230802	Aroclor-1016 Aroclor-1260	UJ (all non-detects)	P	Laboratory control samples (%R) (10)
JW-PDI-053-SG-0-1-20230802	Aroclor-1260	J (all detects)	A	Target analyte quantitation (RPD between two columns) (12)
JW-PDI-055-SG-0-1-20230802	Aroclor-1248 Aroclor-1254	J (all detects) J (all detects)	A	Target analyte quantitation (RPD between two columns) (12)
JW-PDI-115-SG-0-1-20230802	Aroclor-1248	J (all detects)	A	Target analyte quantitation (RPD between two columns) (12)
JW-PDI-035-SG-0-1-20230802	Aroclor-1248	J (all detects)	A	Target analyte quantitation (RPD between two columns) (12)
JW-PDI-051-SG-0-1-20230802	Aroclor-1248	J (all detects)	A	Target analyte quantitation (RPD between two columns) (12)

Jeld-Wen
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG 23H0059

No Sample Data Qualified in this SDG

LDC #: 57784A3b
SDG #: 23H0059
Laboratory: Analytical Resources, Inc., Tukwila, WA

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/4

Date: 12/08/23
Page: 1 of 1
Reviewer: SVG
2nd Reviewer: AC

METHOD: GC Polychlorinated Biphenyls (EPA SW-846 Method 8082A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A, A	RSD ≤ 20% ICV ≤ 20%
III.	Continuing calibration	A	%D ≤ 20%
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	RB = 1, 7
VI.	Surrogate spikes /1S	SW/A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	SW	LCS/D
IX.	Field duplicates	N	
X.	Target analyte quantitation	SW	Not reviewed for Stage 2B validation.
XI.	Target analyte identification	A	Not reviewed for Stage 2B validation.
XII.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Indicates sample underwent Stage 4 validation

	Client ID	Lab ID	Matrix	Date
1	JW-RB-01-20230802	23H0059-01	Water	08/02/23
2	JW-PDI-053-SG-0-1-20230802	23H0059-04	Soil	08/02/23
3	JW-PDI-055-SG-0-1-20230802	23H0059-05	Soil	08/02/23
4	JW-PDI-115-SG-0-1-20230802	23H0059-06	Soil	08/02/23
5	JW-PDI-052-SG-0-1-20230802**	23H0059-07**	Soil	08/02/23
6	JW-PDI-035-SG-0-1-20230802	23H0059-09	Soil	08/02/23
7	JW-RB-02-20230802	23H0059-14	Water	08/02/23
8	JW-PDI-051-SG-0-1-20230802	23H0059-16	Soil	08/02/23
9	JW-PDI-052-SG-0-1-20230802MS	23H0059-07MS	Soil	08/02/23
10	JW-PDI-052-SG-0-1-20230802MSD	23H0059-07MSD	Soil	08/02/23
11				
12				
13				

Notes:

1	BLH0173-BLK1						
2	BLH0143-BLK1						

LDC #: 57784 A36 **VALIDATION FINDINGS CHECKLIST** Page: 1 of 2
Reviewer: JVG

Method: Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/ECD Instrument performance check				
Was the instrument performance found to be acceptable?			✓	
Were Evaluation mix standards analyzed prior to the initial calibration and at beginning of each 12-hour shift?			✓	
Were endrin and 4,4'-DDT breakdowns ≤ 15% for individual breakdown in the Evaluation mix standards?			✓	
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?			✓	
Were the RT windows properly established?	✓			
IIIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20%?	✓			
IV. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20%?	✓			
Were all the retention times within the acceptance windows?	✓			
V. Laboratory Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank performed for each matrix and whenever a sample extraction was performed?	✓			
Was there contamination in the method blanks?		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target analytes detected in the field blanks?		✓		
VII. Surrogate spikes/Internal Standards				
Were all surrogate percent recovery (%R) within the QC limits?		✓		
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?		✓		

Validation Area	Yes	No	NA	Findings/Comments
If any percent recovery (%R) was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
Were internal standard area counts within ± 50% of the average area calculated during calibration?	✓			
VII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
IX. Laboratory control samples				
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		✓		
X. Field duplicates				
Were field duplicate pairs identified in this SDG?	•	✓		
Were target analytes detected in the field duplicates?			✓	
XI. Target analyte quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were target analyte quantitation and RLs adjusted to reflect all sample dilutions, dry weight factors, and clean-up activities applicable to level IV validation?	✓			
Were relative percent difference (RPD) of the results between two columns ≤ 40%?		✓		
XII. Target analyte identification				
Were the retention times of reported detects within the RT windows?	✓			
Were manual integrations performed and found acceptable?			✓	
Did the laboratory provide before and after integration printouts?			✓	
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	K. Endrin	U. Toxaphene	EE. 2,4'-DDT	OO. trans–Heptachlor epoxide
B. beta-BHC	L. Endosulfan II	V. Aroclor-1016	FF. Hexachlorobenzene	PP. Mirex
C. delta-BHC	M. 4,4'-DDD	W. Aroclor-1221	GG. Chlordane	QQ cis-Chlordane
D. gamma-BHC	N. Endosulfan sulfate	X. Aroclor-1232	HH. Chlordane (Technical)	RR. trans-Chlordane
E. Heptachlor	O. 4,4'-DDT	Y. Aroclor-1242	II. Aroclor 1262	SS. Hexachlorobutadiene
F. Aldrin	P. Methoxychlor	Z. Aroclor-1248	JJ. Aroclor 1268	TT. Kepone
G. Heptachlor epoxide	Q. Endrin ketone	AA. Aroclor-1254	KK. Oxychlordane	UU.
H. Endosulfan I	R. Endrin aldehyde	BB. Aroclor-1260	LL. trans-Nonachlor	VV
I. Dieldrin	S. alpha-Chlordane	CC. 2,4'-DDD	MM. cis-Nonachlor	WW.
J. 4,4'-DDE	T. gamma-Chlordane	DD. 2,4'-DDE	NN. cis–Heptachlor epoxide	XX.

Notes:_____

_____

_____

LDC #: 57784 A36

VALIDATION FINDINGS WORKSHEET
Surrogate Spikes

Reviewer: JVG

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were surrogates spiked into all samples, standards and blanks?

Y (N) N/A Did all surrogate percent recoveries (%R) meet the QC limits?

#	Sample ID	Column	Surrogate Compound	%R (Limits)	Qualifications
	1 (ND)	Col 1	B	9.45 (26-120)	J/UJ/P (13)
			A	15.0 (39-120)	
				( )	
	BLH0173-Blk1	Col 1	A	33.3 (39-120)	NA (QC only)
		↓ 2	↓	30.2 (↓)	↓ ↓
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

Letter Designation	Surrogate Compound	Recovery QC Limits (Soil)	Recovery QC Limits (Water)	Comments
A	Tetrachloro-m-xylene			TCMX
B	Decachlorobiphenyl			DCB

#1 B<10 but A>10

LDC #: 57784A3b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: JVG

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

[✓ Y] N N/A Were laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

Y [✓ N] N/A Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

#	LCS/LCSD ID	Compound	LCS %R	LCSD %R	%R Limits	RPD (Limits)	Associated Samples	Qualifications
	BLH0173-BS1/BSD1	V	45.4	57.2	60-140	( )	1, 7, MB1 (ND)	J/UJ/P (10)
		BB	46.5			( )	↓ ↓	↓
						( )		(qual all)
						( )		
						( )		
						( )		
						( )		
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LDC #: 57784A36

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: JVG

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?
Y N N/A Did the percent difference of detected compounds between two columns./detectors ≤40%?
If no, please see findings bellow.

#	Compound Name	Sample ID	%RPD Between Two Columns/Detectors Limit (≤ 40%)	Qualifications
	Aroclor 1260	2	55.1	J dets/A (12)
	1248	3	41.9	
	1254	↓	47.8	
	1248	4	89.6	
	1248	6	48.8	
	1248	8	54.7	✓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 57784A3b

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: JVG

METHOD: GC PCBs (EPA SW 846 Method 8082A)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$ — A_x = Area of Compound — A_{is} = Area of associated internal standard

average RRF = sum of the RRFs/number of standards — C_x = Concentration of compound, — C_{is} = Concentration of internal standard

%RSD = 100 * (S/X) — S= Standard deviation of the RRFs, — X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)	Reported RRF (250 std)	Recalculated RRF (250 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL ECD7	8/19/2021	1260-2 ZB5 (HBP)	0.02326	0.02326	0.02322	0.02322	3.92	3.92
			1260-2 ZB35 (HBP)	0.10172	0.10172	0.10262	0.10262	5.46	5.46

LDC # 57784A3b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

Reviewer: JVG

METHOD: GC PCBs (EPA SW 846 Method 8082A)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = (Ax)(Cis)/(Ais)(Cx)

Where:
ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
Ax = Area of compound,
Cx = Concentration of compound,
Ais = Area of associated internal standard
Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (IS)	Conc	Reported Conc (CCV)	Recalculated Conc (CCV)	Reported % D	Recalculated %D
1	Richfix2ECD7	9/4/2023 16:50	1260-2 ZB5 (HBP)	250.0	239.8	239.8	4.1	4.1
			1260-2 ZB35 (HBP)	250.0	264.0	264.0	5.6	5.6

LDC #: S7784A3b

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: JVG

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: # 5

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Tetrachloro-m-xylene	Col 1	39.947	25.5	63.8	63.8	0
Tetrachloro-m-xylene	2		28.4	71.0	71.0	
Decachlorobiphenyl	1		29.9	74.8	74.8	
Decachlorobiphenyl	2		32.6	81.5	81.5	

Sample ID:

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Tetrachloro-m-xylene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Decachlorobiphenyl						

Notes:

LDC #: 57184 A3b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: JVG

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

The percent recoveries (%R) and Relative Percent difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100* (SSC-SC)/SA

Where: SSC = Spiked sample concentration; SA = Spike added; SC = Concentration

RPD = I MS - MSD I * 2/(MS + MSD)

MS = Matrix spike percent recovery; MSD = Matrix spike duplicate percent recovery

MS/MSD samples: 9/10

Compound	Spike Added (ug/kg)		Sample Conc. (ug/kg)	Spiked Sample Concentration (ug/kg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	-	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
gamma-BHC											
4,4'-DDT											
Aroclor 1260	500	500	20	413	423	78.6	78.6	80.6	80.6	2.49	2.39

Comments: _____

LDC #: 57784A36

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

Reviewer: JVG

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

The percent recoveries (%R) and Relative Percent difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the target analytes identified below using the following calculation:

% Recovery = 100* (SSC-SC)/SA

Where: SSC = Spiked sample concentration
SA = Spike added
SC = Concentration

RPD = I LCS - LCSD I * 2/(LCS + LCSD)

LCS = Laboratory control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: BLH0143 - BS1/BSD1

Compound	Spike Added (ug/kg)		Spiked Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
4,4'-DDT										
gamma-BHC										
Aroclor 1260	500	500	442	444	88.4	88.4	88.8	88.8	0.416	0.451

Comments: _____

LDC #: 57784A36

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: JVG

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

The concentration of the sample was calculated for the target analyte identified below using the following calculation:

$$\text{Concentration} = \frac{(A)\,(Fv)\,(Df)}{(RF)\,(Vs \text{ or } Ws)\,(\%S/100)}$$

A = Area of target analyte
Fv = Final Volume of extract
Df = Dilution Factor
RF = Average Response Factor of target analyte
Vs = Initial Volume of sample
Ws = Initial Weight of sample
%S = Percent Solid

Example:

Sample I.D. 7 1260 Col. 2

1260-2 Conc. $= \frac{\left(\frac{9517}{429470}\right)(80)}{(0.10188831)} = 17.4$

1260 Ave $= \frac{17.4 + 22.5 + 20.1}{3} = 20.00$

conc. $= \frac{(20.0)(5\text{mL})}{(8.52\text{g})(0.5869)} = 19.999$ ug/kg

#	Sample ID	Compound	Reported Concentration (ug/kg)	Calculated Concentration (ug/kg)	Qualification
	7	1260	20.0	20.0	—

Note:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: November 10, 2023

Parameters: Wet Chemistry

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA/
Materials Testing & Consulting, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0059/23B014-16

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-PDI-030-SG-0-1-20230802	23H0059-02/B23-0731	Soil	08/02/23
JW-PDI-033-SG-0-1-20230802	23H0059-03/B23-0734	Soil	08/02/23
JW-PDI-053-SG-0-1-20230802	23H0059-04/B23-0735	Soil	08/02/23
JW-PDI-055-SG-0-1-20230802	23H0059-05/B23-0736	Soil	08/02/23
JW-PDI-115-SG-0-1-20230802	23H0059-06/B23-0737	Soil	08/02/23
JW-PDI-052-SG-0-1-20230802	23H0059-07/B23-0738	Soil	08/02/23
JW-PDI-060-SG-0-1-20230802	23H0059-08/B23-0739	Soil	08/02/23
JW-PDI-035-SG-0-1-20230802	23H0059-09/B23-0740	Soil	08/02/23
JW-PDI-028-SG-0-1-20230802	23H0059-11/B23-0741	Soil	08/02/23
JW-PDI-032-SG-0-1-20230802	23H0059-12/B23-0742	Soil	08/02/23
JW-PDI-029-SG-0-1-20230802	23H0059-13/B23-0743	Soil	08/02/23
JW-PDI-061-SG-0-1-20230802	23H0059-15/B23-0744	Soil	08/02/23
JW-PDI-051-SG-0-1-20230802	23H0059-16/B23-0745	Soil	08/02/23
JW-PDI-030-SG10-1-20230802DUP	23H0059-02/B23-0731DUP	Soil	08/02/23
JW-PDI-030-SG-0-1-20230802TRP	23H0059-02/B23-0731TRP	Soil	08/02/23

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Moisture Content by American Society for Testing and Material (ASTM) C556 and ASTM D2216
Organic Matter by ASTM D2974
Total Solids by ASTM D2216

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

Initial calibration analysis was not required by the methods.

III. Continuing Calibration

Continuing calibration frequency and analysis was not required by the methods.

IV. Laboratory Blanks

Laboratory blank analysis was not required by the methods.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the methods.

VII. Triplicate Sample Analysis

Triplicate (TRP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

TRP ID (Associated Samples)	Analyte	%RSD (≤20)	Flag	A or P
JW-PDI-030-SG-0-1-20230802TRP (JW-PDI-030-SG-0-1-20230802 JW-PDI-033-SG-0-1-20230802 JW-PDI-053-SG-0-1-20230802 JW-PDI-055-SG-0-1-20230802 JW-PDI-115-SG-0-1-20230802 JW-PDI-052-SG-0-1-20230802 JW-PDI-060-SG-0-1-20230802 JW-PDI-035-SG-0-1-20230802 JW-PDI-028-SG-0-1-20230802 JW-PDI-032-SG-0-1-20230802 JW-PDI-029-SG-0-1-20230802 JW-PDI-061-SG-0-1-20230802 JW-PDI-051-SG-0-1-20230802)	Moisture Content	28	J (all detects)	A

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were not required by the methods.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Target Analyte Quantitation

Raw data were not reviewed for Stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Data qualified due to TRP %RSD are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Wet Chemistry - Data Qualification Summary - SDG 23H0059/23B014-16

Sample	Analyte	Flag	A or P	Reason (Code)
JW-PDI-030-SG-0-1-20230802 JW-PDI-033-SG-0-1-20230802 JW-PDI-053-SG-0-1-20230802 JW-PDI-055-SG-0-1-20230802 JW-PDI-115-SG-0-1-20230802 JW-PDI-052-SG-0-1-20230802 JW-PDI-060-SG-0-1-20230802 JW-PDI-035-SG-0-1-20230802 JW-PDI-028-SG-0-1-20230802 JW-PDI-032-SG-0-1-20230802 JW-PDI-029-SG-0-1-20230802 JW-PDI-061-SG-0-1-20230802 JW-PDI-051-SG-0-1-20230802	Moisture Content	J (all detects)	A	Triplicate sample analysis (%RSD) (24)

Jeld-Wen
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 23H0059/23B014-16

No Sample Data Qualified in this SDG

LDC #: 57784A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/9/23
SDG #: 23H0059/23B014-16 Stage 2B Page: 1 of 1
Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer: NF
Sub-Laboratory: Materials Testing & Consulting, Inc., Tukwila, WA 2nd Reviewer: AC

METHOD: (Analyte) Moisture Content (ASTM C556/ASTM D2216), Organic Matter (ASTM D2974), Total Solids (ASTM D2216)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II	Initial calibration	N	
III.	Calibration verification	N	
IV	Laboratory Blanks	N	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	N	
VII.	Duplicate sample analysis	SW	
VIII.	Laboratory control samples	N	
IX.	Field duplicates	N	
X.	Target Analyte Quantitation	N	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Sub-Lab ID	Lab ID	Matrix	Date
1	JW-PDI-030-SG-0-1-20230802	B23-0731	23H0059-02	Soil	08/02/23
2	JW-PDI-033-SG-0-1-20230802	B23-0734	23H0059-03	Soil	08/02/23
3	JW-PDI-053-SG-0-1-20230802	B23-0735	23H0059-04	Soil	08/02/23
4	JW-PDI-055-SG-0-1-20230802	B23-0736	23H0059-05	Soil	08/02/23
5	JW-PDI-115-SG-0-1-20230802	B23-0737	23H0059-06	Soil	08/02/23
6	JW-PDI-052-SG-0-1-20230802	B23-0738	23H0059-07	Soil	08/02/23
7	JW-PDI-060-SG-0-1-20230802	B23-0739	23H0059-08	Soil	08/02/23
8	JW-PDI-035-SG-0-1-20230802	B23-0740	23H0059-09	Soil	08/02/23
9	JW-PDI-028-SG-0-1-20230802	B23-0741	23H0059-11	Soil	08/02/23
10	JW-PDI-032-SG-0-1-20230802	B23-0742	23H0059-12	Soil	08/02/23
11	JW-PDI-029-SG-0-1-20230802	B23-0743	23H0059-13	Soil	08/02/23
12	JW-PDI-061-SG-0-1-20230802	B23-0744	23H0059-15	Soil	08/02/23
13	JW-PDI-051-SG-0-1-20230802	B23-0745	23H0059-16	Soil	08/02/23
~~14~~	~~JW-PDI-030-SG-0-1-20230802TRP1~~		~~23H0059-02TRP1~~	~~Soil~~	~~08/02/23~~
15	JW-PDI-030-SG10-1-20230802~~TRP2~~ DUP	B23-0732	23H0059-02TRP2	Soil	08/02/23
16	JW-PDI-030-SG-0-1-20230802~~TRP3~~ TRP	B23-0733	23H0059-02TRP3	Soil	08/02/23

All elements are applicable to each sample as noted below.

Sample ID	Target Analyte List
1-13	Moisture Content, Organic Matter
3-6, 8-9, 11, 13	Total Solids
QC	
15-16	Moisture Content, Organic Matter

Laboratory Duplicates

METHOD: Inorganics

Laboratory duplicate analysis was performed by the laboratory. All laboratory duplicates were within the relative percent difference (RPD) for samples >5X the reporting limits with the exceptions listed below. If samples were <5X the reporting limits, the difference was within 1X the reporting limit for water samples and within 2X the reporting limit for soil samples

Duplicate ID	Triplicate ID	Matrix	Analyte	RPD	RPD Limit	RSD	RSD Limit	Associated Samples	Qualification	Det/ND
15	16	soil	Moisture Content			28	20	1-13	Jdet/A (~~25~~ 24)	Det

Comments:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: December 11, 2023

Parameters: Polychlorinated Dioxins/Dibenzofurans

Validation Level: Stage 2B & 4

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 23H0059

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-RB-01-20230802	23H0059-01	Water	08/02/23
JW-PDI-053-SG-0-1-20230802	23H0059-04	Soil	08/02/23
JW-PDI-055-SG-0-1-20230802	23H0059-05	Soil	08/02/23
JW-PDI-115-SG-0-1-20230802	23H0059-06	Soil	08/02/23
JW-PDI-052-SG-0-1-20230802**	23H0059-07**	Soil	08/02/23
JW-PDI-035-SG-0-1-20230802	23H0059-09	Soil	08/02/23
JW-PDI-034-SG-0-1-20230802	23H0059-10	Soil	08/02/23
JW-PDI-028-SG-0-1-20230802	23H0059-11	Soil	08/02/23
JW-PDI-029-SG-0-1-20230802	23H0059-13	Soil	08/02/23
JW-RB-02-20230802	23H0059-14	Water	08/02/23
JW-PDI-051-SG-0-1-20230802	23H0059-16	Soil	08/02/23

**Indicates sample underwent Stage 4 validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for High Resolution Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Dioxins/Dibenzofurans by Environmental Protection Agency (EPA) Method 1613B

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Stage 4 data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other
25 Less than reporting limit

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25%.

The static resolving power was at least 10,000 (10% valley definition).

III. Initial Calibration and Initial Calibration Verification

A five point initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all analytes and less than or equal to 30.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The minimum S/N ratio was greater than or equal to 10 for each analyte and labeled compound associated to samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

The percent differences (%D) of the initial calibration verification (ICV) standard were within the QC limits for all analytes and labeled compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration results were within the QC limits for all analytes and labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The minimum S/N ratio was greater than or equal to 10 for each analyte and labeled compound associated to samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Analyte	Concentration	Associated Samples
BLH0132-BLK1	08/07/23	OCDD	3.48 ng/Kg	All soil samples in SDG 23H0059
BLH0132-BLK2	08/09/23	OCDD	194 pg/L	All water samples in SDG 23H0059

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration (pg/L)	Modified Final Concentration (pg/L)
JW-RB-02-20230802	OCDD	57.9	57.9U

VI. Field Blanks

Samples JW-RB-01-20230802 and JW-RB-02-20230802 were identified as rinse blanks. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration (pg/L)
JW-RB-01-20230802	1,2,3,4,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDF OCDD	5.60 10.8 12.0 39.4 487 41.9 1680 2700 29000
JW-RB-02-20230802	OCDF OCDD	6.38 57.9

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Labeled Compounds

All percent recoveries (%R) for labeled compounds used to quantitate target analytes were within QC limits.

XI. Target Analyte Quantitation

All target analyte quantitations were within validation criteria with the following exceptions:

Sample	Analyte	Flag	A or P
All samples in SDG 23H0059	All analytes reported by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A

Raw data were not reviewed for Stage 2B validation.

XII. Target Analyte Identification

All target analyte identifications met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Data qualified due to results reported by the laboratory as EMPCs and laboratory blank contamination are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Data Qualification Summary - SDG 23H0059

Sample	Analyte	Flag	A or P	Reason (Code)
JW-RB-01-20230802 JW-PDI-053-SG-0-1-20230802 JW-PDI-055-SG-0-1-20230802 JW-PDI-115-SG-0-1-20230802 JW-PDI-052-SG-0-1-20230802** JW-PDI-035-SG-0-1-20230802 JW-PDI-034-SG-0-1-20230802 JW-PDI-028-SG-0-1-20230802 JW-PDI-029-SG-0-1-20230802 JW-RB-02-20230802 JW-PDI-051-SG-0-1-20230802	All analytes reported by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A	Target analyte quantitation (EMPC) (23)

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG 23H0059

Sample	Analyte	Modified Final Concentration (pg/L)	A or P	Code
JW-RB-02-20230802	OCDD	57.9U	A	7

LDC #: 57784A21 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/08/23
SDG #: 23H0059 Stage 2B/4 Page: 1 of 1
Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer: JV
2nd Reviewer: JL

METHOD: HRGC/HRMS Polychlorinated Dioxins/Dibenzofurans (EPA Method 1613B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	RSD ≤ 20/30 %. ICVE QC limits
IV.	Continuing calibration	A	%D ≤ QC limits
V.	Laboratory Blanks	SW	
VI.	Field blanks	SW	RB = 1, 10
VII.	Matrix spike/Matrix spike duplicates	N	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Labeled Compounds	A	
XI.	Target analyte quantitation	SW	Not reviewed for Stage 2B validation.
XII.	Target analyte identification	A	Not reviewed for Stage 2B validation.
XIII	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Stage 4 validation

	Client ID	Lab ID	Matrix	Date
1	JW-RB-01-20230802	23H0059-01	Water	08/02/23
2	JW-PDI-053-SG-0-1-20230802	23H0059-04	Soil	08/02/23
3	JW-PDI-055-SG-0-1-20230802	23H0059-05	Soil	08/02/23
4	JW-PDI-115-SG-0-1-20230802	23H0059-06	Soil	08/02/23
5	JW-PDI-052-SG-0-1-20230802**	23H0059-07**	Soil	08/02/23
6	JW-PDI-035-SG-0-1-20230802	23H0059-09	Soil	08/02/23
7	JW-PDI-034-SG-0-1-20230802	23H0059-10	Soil	08/02/23
8	JW-PDI-028-SG-0-1-20230802	23H0059-11	Soil	08/02/23
9	JW-PDI-029-SG-0-1-20230802	23H0059-13	Soil	08/02/23
10	JW-RB-02-20230802	23H0059-14	Water	08/02/23
11	JW-PDI-051-SG-0-1-20230802	23H0059-16	Soil	08/02/23
12				

Notes:

+ 1	BLH0132-BLK1						
+ 2	BLH0234-BLK2						

Method: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	√			
Cooler temperature criteria was met.	√			
II. GC/MS Instrument performance check				
Was PFK exact mass 380.9760 verified?	√			
Were the retention time windows established for all homologues?	√			
Was the chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomers ≤ 25% ?	√			
Is the static resolving power at least 10,000 (10% valley definition)?	√			
Was the mass resolution adequately check with PFK?	√			
Was the presence of 1,2,8,9-TCDD and 1,3,4,6,8-PeCDF verified?	√			
IIIa. Initial calibration				
Was the initial calibration performed at 5 concentration levels?	√			
Were all percent relative standard deviations (%RSD) ≤ 20% for unlabeled compounds and for unlabeled compounds?	√			
Did all calibration standards meet the Ion Abundance Ratio criteria?	√			
Was the signal to noise ratio for each target compound and labeled compound ≥ 10?	√			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	√			
Were all ICV percent differences (%D) ≤ 20% for target analytes and ≤ 30% for labeled compounds?	√			
IV. Continuing calibration				
Was a continuing calibration performed at the beginning of each 12 hour period?	√			
Were all percent differences (%D) ≤ 20% for target analytes and ≤ 30% for labeled compounds?	√			
Did all continuing calibration standards meet the Ion Abundance Ratio criteria?	√			
V. Blanks				
Was a method blank associated with every sample in this SDG?	√			
Was a method blank performed for each matrix and whenever a sample extraction was performed?	√			
Was there contamination in the method blanks?	√			
VI. Field blanks				
Were field blanks identified in this SDG?	√			
Were target analytes detected in the field blanks?	√			
VII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?		√		
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			√	

Validation Area	Yes	No	NA	Findings/Comments
VIII. Laboratory control samples				
Was an LCS analyzed per extraction batch?	√			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	√			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?		√		
Were target analytes detected in the field duplicates?			√	
X. Labeled compounds				
Were labeled compounds within QC limits (Method 1613B, Table 7)?	√			
Was the minimum S/N ratio of all labeled compound peaks ≥ 10?	√			
XI. Target analyte quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	√			
Were the correct labeled compound, quantitation ion and relative response factor (RRF) used to quantitate the analyte?	√			
Were target analyte quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	√			
XII. Target analyte identification				
For 2,3,7,8 substituted congeners with associated labeled standards, were the retention times of the two quantitation peaks within -1 to 3 sec. of the RT of the labeled standard?	√			
For 2,3,7,8 substituted congeners without associated labeled standards, were the relative retention times of the two quantitation peaks within 0.005 time units of the RRT measured in the routine calibration?	√			
For non-2,3,7,8 substituted congeners, were the retention times of the two quantitation peaks within RT established in the performance check solution?	√			
Did analyte spectra contain all characteristic ions listed in the table attached?	√			
Was the Ion Abundance Ratio for the two quantitation ions within criteria?	√			
Was the signal to noise ratio for each target analyte ≥2.5 and ≥10 for the labeled compound?	√			
Does the maximum intensity of each specified characteristic ion coincide within ± 2 seconds (includes labeled standards)?	√			
For PCDF identification, was any signal (S/N ≥ 2.5, at ± seconds RT) detected in the corresponding PCDPE channel?			√	
Was an acceptable lock mass recorded and monitored?	√			
Were manual integrations reviewed and found acceptable?	√			
Did the laboratory provide before and after integration printouts?	√			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	√			

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

A. 2,3,7,8-TCDD	F. 1,2,3,4,6,7,8-HpCDD	K. 1,2,3,4,7,8-HxCDF	P. 1,2,3,4,7,8,9-HpCDF	U. Total HpCDD
B. 1,2,3,7,8-PeCDD	G. OCDD	L. 1,2,3,6,7,8-HxCDF	Q. OCDF	V. Total TCDF
C. 1,2,3,4,7,8-HxCDD	H. 2,3,7,8-TCDF	M. 2,3,4,6,7,8-HxCDF	R. Total TCDD	W. Total PeCDF
D. 1,2,3,6,7,8-HxCDD	I. 1,2,3,7,8-PeCDF	N. 1,2,3,7,8,9-HxCDF	S. Total PeCDD	X. Total HxCDF
E. 1,2,3,7,8,9-HxCDD	J. 2,3,4,7,8-PeCDF	O. 1,2,3,4,6,7,8-HpCDF	T. Total HxCDD	Y. Total HpCDF

Notes:_____

LDC #: 57784 A21

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: JVG

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
Y N N/A Was the method blank contaminated?

Blank extraction date: 08/07/23 **Blank analysis date:** 09/05/23 **Associated samples:** All S (7 5x)

Conc. units: ng/kg

Compound	Blank ID	Sample Identification								
	BLH0132-BLK1 (5x)									
G	3.48	17.4								

Blank extraction date: 08/09/23 **Blank analysis date:** 08/19/23

Conc. units: pg/L Associated Samples: All W Code: 7

Compound	Blank ID	Sample Identification								
	BLH0234-BLK2 (5x)			10						
G	194	970		57.9						

LDC #: 57784A21

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: JVG

METHOD: HRGC/HRMS PCDD/PCDF (EPA Method 1613B)

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target analytes detected in the field blanks?

Rinse Blank

Conc units : pg/L

Analytes	Blank ID	Blank ID
	1	10
K	5.60	
M	10.8	
D	12.0	
E	39.4	
O	487	
P	41.9	
F	1680	
Q	2700	6.38
G	29000	57.9

LDC #: 57784A21

VALIDATION FINDINGS WORKSHEET
Target Analyte Quantitation and Reported RLs

Reviewer: JVG

METHOD: GC/MS Dioxins/Dibenzofurans (Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the analyte?

Y N N/A Were analyte quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors (if necessary)?

#	Date	Associated Samples	Finding	Compound	Qualifications
		All	All analytes reported as estimated maximum possible concentration (EMPC).		Jdets/A (23)

LDC #: 57784A21

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: JVG

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$ — A_x = Area of Compound — A_{is} = Area of associated internal standard

average RRF = sum of the RRFs/number of standards — C_x = Concentration of compound, — C_{is} = Concentration of internal standard

%RSD = 100 * (S/X) — S= Standard deviation of the RRFs, — X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)		Reported RRF	Recalculated RRF	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL Autospec01 GH00041	8/11/2023	2,3,7,8-TCDF	(13C-2,3,7,8-TCDF)	0.8957	0.8957	0.9031	0.9031	1.2	1.2
			2,3,7,8-TCDD	(13C-2,3,7,8-TCDD)	1.1713	1.1714	1.2430	1.2430	3.8	3.8
			1,2,3,6,7,8-HxCDD	(13C-1,2,3,6,7,8-HxCDD	0.9221	0.3363	0.8827	0.8827	4.4	4.4
			1,2,3,4,6,7,8-HpCDF	(13C-1,2,4,6,7,8,-HpCDF	1.1243	1.1245	1.1637	1.1637	3.8	3.8
			OCDD	(13C-OCDD)	0.9900	0.9899	1.0587	1.0587	6.0	6.0

LDC# 57784A21

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = (Ax)(Cis)/(Ais)(Cx)

Where:
ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
Ax = Area of compound,
Cx = Concentration of compound,
Ais = Area of associated internal standard
Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound	(Ref IS)	Average RRF (Initial)	Reported RRF (CCV)	Recalculated RRF (CCV)	Reported % D	Recalculated %D
1	SLI0060-CCV1	9/5/2023 20:40	2,3,7,8-TCDF	(13C-2,3,7,8-TCDF)	0.9031	0.9319	0.9319	3.2	3.2
			2,3,7,8-TCDD	(13C-2,3,7,8-TCDD)	1.2430	1.1872	1.1872	4.5	4.5
			1,2,3,6,7,8-HxCDD	(13C-1,2,3,6,7,8-HxCD	0.8827	0.9173	0.9173	3.9	3.9
			1,2,3,4,6,7,8-HpCDF	(13C-1,2,4,6,7,8,-HpCI	1.1637	1.1934	1.1934	2.6	2.6
			OCDD	(13C-OCDD)	1.0587	0.9551	0.9551	9.8	9.8

LDC #: 57784A21

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: JVG

METHOD: GC/MS Dioxins/Dibenzofurans (EPA Method 1613B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration
SA = Spike added

RPD = | LCS - LCSD | * 2/(LCS + LCSD) LCS = Laboratory control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS ID: BLH0234-BS1

Compound	Spike Added (ng/Kg)		Spiked Sample Concentration (ng/Kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
2,3,7,8-TCDD	20	NA	19.6	NA	97.9	98.0				
1,2,3,7,8-PeCDD	100		99.9		100	100				
1,2,3,4,7,8-HxCDD	100		93.2		93.2	93.2				
1,2,3,4,7,8,9-HpCDF	100		113		113	113				
OCDF	200		205		102	102				

LDC #: 57784A21

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: JVG

METHOD: GC/MS Dioxins/Dibenzofurans (Method 1613B)

The concentration of the sample was calculated for the target analyte identified below using the following calculation:

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the analyte to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

RRF = Relative Response Factor (average) from the initial calibration

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

Example:

Sample I.D. 5 , OCDD :

Conc. = $\frac{(865400)\ (200)\ (20uL)}{(446300)\ (1.0587)(16.74g)(0.5980)}$

= 731.85 ng/Kg

#	Sample ID	Analyte	Reported Concentration (ng/Kg)	Calculated Concentration (ng/Kg)	Acceptable
	5	OCDD	732	732	-

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Anchor QEA, LLC
1201 Third Ave. Suite 2600
Seattle, WA 98101
ATTN: Ms. Delaney Peterson
dpeterson@anchorqea.com

July 15, 2024

SUBJECT: Jeld-Wen - Data Validation

Dear Ms. Peterson,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on June 28, 2024. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #59293:

SDG #	Fraction
24E0633 24E0642	Polychlorinated Dioxins/Dibenzofurans, Polynuclear Aromatic Hydrocarbons, Polychlorinated Biphenyls

The data validation was performed under Stage 2B & 4 guidelines. The analysis was validated using the following documents, as applicable to each method:

- Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023)
- USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020)
- USEPA National Functional Guidelines (NFG) for High Resolution Superfund Methods Data Review (November 2020)
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Stella Cuenco
scuenco@lab-data.com
Project Manager/Senior Chemist

Stage 2B (PCB & Diox 90/10) EDD

LDC# 59293 (Anchor Environmental-Seattle WA / Jeld-Wen)

LDC	SDG#	DATE REC'D	(3) DATE DUE	PAHs (8270E -SIM)		PCBs (8082A)		Dioxins (1613B)																													
Matrix:	Water/Solid-Sediment			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	24E0633	06/28/24	07/22/24	-	-	-	-	0	2																												
B	24E0642	06/28/24	07/22/24	1	0	1	0	1	0																												
B	24E0642	06/28/24	07/22/24	0	0	0	0	0	1																												
Total	TR/SC			1	0	1	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS, MSD, or DUP's.

LDC Report# 59293A21

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: July 9, 2024

Parameters: Polychlorinated Dioxins/Dibenzofurans

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 24E0633

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-SG-150-0-1-20240528	24E0633-02	Solid	05/28/24
JW-SG-149-0-1-20240528	24E0633-03	Solid	05/28/24

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for High Resolution Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Dioxins/Dibenzofurans by Environmental Protection Agency (EPA) Method 1613B

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The reported result was an estimated quantity value.

U (Non-detected): The analyte was analyzed for, but was not detected above the level of the adjusted detection limit or quantitation limit, as appropriate.

UJ (Non-detected): The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

NJ (Tentatively identified): The analyte has been "tentatively identified" or "presumptively identified" as present, and the associated numerical value was the estimated concentration in the sample.

R (Rejected): The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25%.

The static resolving power was at least 10,000 (10% valley definition).

III. Initial Calibration and Initial Calibration Verification

A five point initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all analytes and less than or equal to 35.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were within the QC limits for all analytes and labeled compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration results were within the QC limits for all analytes and labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Analyte	Concentration (ng/Kg)	Associated Samples
BMF0088-BLK1	06/11/24	Total HxCDD	0.145	All samples in SDG 24E0633

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples/Standard Reference Materials

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

Standard reference materials (SRM) were analyzed as required by the method. The results were within QC limits.

SRM ID	Analyte	%R (50-150)	Associated Samples	Flag	A or P
BMF0088-SRM1	1,2,3,7,8,9-HxCDF	198	JW-SG-150-0-1-20240528	J (all detects)	P
BMF0088-SRM1	1,2,3,7,8,9-HxCDF	198	JW-SG-149-0-1-20240528	NA	-

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Labeled Compounds

All percent recoveries (%R) for labeled compounds used to quantitate target analytes were within QC limits.

XI. Target Analyte Quantitation

All target analyte quantitations were within validation criteria with the following exceptions:

Sample	Analyte	Flag	A or P
All samples in SDG 24E0633	All analytes reported by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A
JW-SG-150-0-1-20240528	All analyte flagged "X" by the laboratory indicates possible CDPE interference.	J (all detects)	A

XII. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Data qualified due to SRM %R, results reported by the laboratory as EMPC, and CDPE interference are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Data Qualification Summary - SDG 24E0633

Sample	Analyte	Flag	A or P	Reason (Code)
JW-SG-150-0-1-20240528	1,2,3,7,8,9-HxCDF	J (all detects)	P	Standard reference materials (%R) (10)
JW-SG-150-0-1-20240528 JW-SG-149-0-1-20240528	All analytes reported by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A	Target analyte quantitation (EMPC) (23)
JW-SG-150-0-1-20240528	All analyte flagged "X" by the laboratory indicates possible CDPE interference.	J (all detects)	A	Target analyte quantitation (CDPE interference) (24)

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG 24E0633

No Sample Data Qualified in this SDG

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG 24E0633

No Sample Data Qualified in this SDG

LDC #: 59293A21 **VALIDATION COMPLETENESS WORKSHEET** Date: 07/02/24
SDG #: 24E0633 Stage 2B Page: 1 of 1
Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer: JVG
2nd Reviewer: CF

METHOD: HRGC/HRMS Polychlorinated Dioxins/Dibenzofurans (EPA Method 1613B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A, A	
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration/ICV	A, A	RSD ≤ 20/35% ICV ≤ QC limits
IV.	Continuing calibration	A	CCV ≤ QC limits
V.	Laboratory Blanks	SW	
VI.	Field blanks	N	
VII.	Matrix spike/Matrix spike duplicates	N	CS
VIII.	Laboratory control samples	SW	LCS, SRM
IX.	Field duplicates	N	
X.	Labeled Compounds	A	
XI.	Target analyte quantitation	SW	
XII.	Target analyte identification	N	
XIII	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	JW-SG-150-0-1-20240528	24E0633-02	Solid	05/28/24
2	JW-SG-149-0-1-20240528	24E0633-03	Solid	05/28/24
3				
4				
5				
6				
7				
8				
9				
10				
11				

Notes:

+	BMF0088-BLK1						

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

A. 2,3,7,8-TCDD	F. 1,2,3,4,6,7,8-HpCDD	K. 1,2,3,4,7,8-HxCDF	P. 1,2,3,4,7,8,9-HpCDF	U. Total HpCDD
B. 1,2,3,7,8-PeCDD	G. OCDD	L. 1,2,3,6,7,8-HxCDF	Q. OCDF	V. Total TCDF
C. 1,2,3,4,7,8-HxCDD	H. 2,3,7,8-TCDF	M. 2,3,4,6,7,8-HxCDF	R. Total TCDD	W. Total PeCDF
D. 1,2,3,6,7,8-HxCDD	I. 1,2,3,7,8-PeCDF	N. 1,2,3,7,8,9-HxCDF	S. Total PeCDD	X. Total HxCDF
E. 1,2,3,7,8,9-HxCDD	J. 2,3,4,7,8-PeCDF	O. 1,2,3,4,6,7,8-HpCDF	T. Total HxCDD	Y. Total HpCDF

Notes:_____

LDC #: 59293A21

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: JVG

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a method blank?

Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?

Y N N/A Was the method blank contaminated?

Blank extraction date: 06/11/24 **Blank analysis date:** 06/15/24 **Associated samples:** All (>5X)

Conc. units: ng/kg

Compound	Blank ID	Sample Identification								
	BMF0088-BLK1									
T	0.145									

Blank extraction date: _____ **Blank analysis date:** _____

Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

LDC #:__________

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS) /SRM

Page: 1 of 1
Reviewer: JVG

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

[✓ Y] [✓ N] N/A Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

#	LCS/LCSD ID	Compound	LCS %R	LCSD %R	%R Limits	RPD (Limits)	Associated Samples	(10) Qualifications
	BMF0088-SRM1	N	198		50-150	( )	All (Det)	J dets/P
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
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						( )		
						( )		
						( )		
						( )		
						( )		
						( )		

LDC #: 59293A21

VALIDATION FINDINGS WORKSHEET
Target Analyte Quantitation and Reported RLs

Reviewer: JVG

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the analyte?

Y N N/A Were analyte quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors (if necessary)?

#	Date	Associated Samples	Analyte	Finding	Qualifications
		All	-	All analytes reported as estimated maximum possible concentration (EMPC).	Jdets/A (23)
		1	H	Analyte flagged "X" by the laboratory indicates possible CDPE interference	J dets/A (24)

Note; No dilution performed

LDC Report# 59293B2b

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: July 5, 2024

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 24E0642

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-RB-20240529	24E0642-02	Water	05/29/24
JW-RB-20240529MS	24E0642-02MS	Water	05/29/24
JW-RB-20240529MSD	24E0642-02MSD	Water	05/29/24

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270E in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The reported result was an estimated quantity value.

U (Non-detected): The analyte was analyzed for, but was not detected above the level of the adjusted detection limit or quantitation limit, as appropriate.

UJ (Non-detected): The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

NJ (Tentatively identified): The analyte has been "tentatively identified" or "presumptively identified" as present, and the associated numerical value was the estimated concentration in the sample.

R (Rejected): The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other

I. Sample Receipt and Technical Holding Times

The chain-of-custodies were reviewed for documentation of cooler temperatures. Cooler temperatures for samples in this SDG were reported at 8.2°C upon receipt by the laboratory. Since the samples were received the same day that they were collected, time did not allow for sufficient cooling of the samples, therefore no data were qualified.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check was performed at the required frequency.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For analytes where average relative response factors (RRFs) were utilized, percent relative standard deviations (%RSD) were less than or equal to 20.0%.

Average relative response factors (RRF) for all analytes were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all analytes.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all analytes.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample JW-RB-20240529 was identified as a rinse blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Target Analyte Quantitation

Raw data were not reviewed for Stage 2B validation.

XIII. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Jeld-Wen
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 24E0642

No Sample Data Qualified in this SDG

Jeld-Wen
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 24E0642

No Sample Data Qualified in this SDG

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG 24E0642

No Sample Data Qualified in this SDG

LDC #: 59293B2b

SDG #: 24E0642

Laboratory: Analytical Resources, Inc., Tukwila, WA

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

Date: 07/02/24

Page: 1 of 1

Reviewer: SV6

2nd Reviewer: [illegible]

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW-846 Method 8270E-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	SW / A	cooler temp = 8.2°c (Received same day, insufficient time to cool)
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	RSD ≤ 20% ICV ≤ 30%
IV.	Continuing calibration	A	CCV ≤ 20%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	RB = 1
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Target analyte quantitation	N	
XIII.	Target analyte identification	N	
XIV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	JW-RB-20240529	24E0642-02	Water	05/29/24
2	JW-RB-20240529MS	24E0642-02MS	Water	05/29/24
3	JW-RB-20240529MSD	24E0642-02MSD	Water	05/29/24
4				
5				
6				
7				
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9				
10				

Notes:

-	BMF0039-BLK1						

LDC Report# 59293B3b

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: July 9, 2024

Parameters: Polychlorinated Biphenyls

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 24E0642

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-RB-20240529	24E0642-02	Water	05/29/24
JW-RB-20240529MS	24E0642-02MS	Water	05/29/24
JW-RB-20240529MSD	24E0642-02MSD	Water	05/29/24

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The reported result was an estimated quantity value.

U (Non-detected): The analyte was analyzed for, but was not detected above the level of the adjusted detection limit or quantitation limit, as appropriate.

UJ (Non-detected): The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

NJ (Tentatively identified): The analyte has been "tentatively identified" or "presumptively identified" as present, and the associated numerical value was the estimated concentration in the sample.

R (Rejected): The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other

I. Sample Receipt and Technical Holding Times

The chain-of-custodies were reviewed for documentation of temperatures. Although the cooler temperatures for all samples were reported at/between 8.2°C upon receipt by the laboratory, using professional judgment, no data was qualified based on these cooler temperatures since the compounds are not expected to degrade significantly during shipping or storage.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all analytes.

In the case where the laboratory used a calibration curve to evaluate the analytes, all coefficients of determination (r^2) were greater than or equal to 0.990.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all analytes.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all analytes with the following exceptions:

Date	Standard	Column	Analyte	%D	Associated Samples	Affected Analyte	Flag	A or P
06/17/24	SMF0223-CCV4	Col 1	Aroclor 1260	23.6	All samples in SDG 24E0642	Aroclor 1248 Aroclor 1254 Aroclor 1260	NA	-

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample JW-RB-20240529 was identified as a rinse blank. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Target Analyte Quantitation

Raw data were not reviewed for Stage 2B validation.

XI. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Jeld-Wen
Polychlorinated Biphenyls - Data Qualification Summary - SDG 24E0642

No Sample Data Qualified in this SDG

Jeld-Wen
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG 24E0642

No Sample Data Qualified in this SDG

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG 24E0642

No Sample Data Qualified in this SDG

LDC #: 59293B3b

SDG #: 24E0642

Laboratory: Analytical Resources, Inc., Tukwila, WA

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

Date: 07/02/24

Page: 1 of 1

Reviewer: JG

2nd Reviewer: CL

METHOD: GC Polychlorinated Biphenyls (EPA SW-846 Method 8082A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	SW, A	Cooler temp = 8.2°C (Text)
II.	Initial calibration/ICV	A, A	RSD ≤ 20% r² ICV ≤ 20%
III.	Continuing calibration	SW	CCV ≤ 20%
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	RB = 1
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Target analyte quantitation	N	
XI.	Target analyte identification	N	
XII.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	JW-RB-20240529	24E0642-02	Water	05/29/24
2	JW-RB-20240529MS	24E0642-02MS	Water	05/29/24
3	JW-RB-20240529MSD	24E0642-02MSD	Water	05/29/24
4				
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11				
12				
13				

Notes:

	BMF0048-BLK1						

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	K. Endrin	U. Toxaphene	EE. 2,4'-DDT	OO. trans–Heptachlor epoxide
B. beta-BHC	L. Endosulfan II	V. Aroclor 1016	FF. Hexachlorobenzene	PP. Mirex
C. delta-BHC	M. 4,4'-DDD	W. Aroclor 1221	GG. Chlordane	QQ cis-Chlordane
D. gamma-BHC	N. Endosulfan sulfate	X. Aroclor 1232	HH. Chlordane (Technical)	RR. trans-Chlordane
E. Heptachlor	O. 4,4'-DDT	Y. Aroclor 1242	II. Aroclor 1262	SS. Hexachlorobutadiene
F. Aldrin	P. Methoxychlor	Z. Aroclor 1248	JJ. Aroclor 1268	TT. Kepone
G. Heptachlor epoxide	Q. Endrin ketone	AA. Aroclor 1254	KK. Oxychlordane	UU. Chlorpyrifos
H. Endosulfan I	R. Endrin aldehyde	BB. Aroclor 1260	LL. trans-Nonachlor	VV
I. Dieldrin	S. alpha-Chlordane	CC. 2,4'-DDD	MM. cis-Nonachlor	WW.
J. 4,4'-DDE	T. gamma-Chlordane	DD. 2,4'-DDE	NN. cis–Heptachlor epoxide	XX.

Notes:_____

LDC #: 59293B21

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: JVG

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Please see qualifications below for all questions answered "N" Not applicable questions are identified as "N/A".

Y N [✓ N/A] Were Evaluation mix standards run before initial calibration and before samples?
Y N [✓ N/A] Were Endrin & 4,4'-DDT breakdowns acceptable in the Evaluation Mix standard (≤15.0% for individual breakdowns)?
[✓ Y] N N/A Was at least one standard run daily to verify the working curve?
Y [✓ N] N/A Did the continuing calibration standards meet the percent difference (%D) / relative percent difference (RPD) criteria of ≤20.0%?

Level IV/D Only

Y N [✓ N/A] Were the retention times for all calibrated compounds within their respective acceptance windows?

#	Date	Standard ID	Column	Compound	%D (Limit ≤ 20.0)	RT (Limits)	Associated Samples	⑤ Qualifications
	06/17/24	SMF0223-CCV4	Col 1	BB (+)	23.6	( )	All (ND)	J dets/A
						( )		(qual Z, AA, BB)
						( )		
						( )		
						( )		
						( )		
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						( )		
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A. alpha-BHC
B. beta-BHC
C. delta-BHC
D. gamma-BHC
E. Heptachlor
F. Aldrin
G. Heptachlor epoxide
H. Endosulfan I
I. Dieldrin
J. 4,4'-DDE
K. Endrin
L. Endosulfan II
M. 4,4'-DDD
N. Endosulfan sulfate
O. 4,4'-DDT
P. Methoxychlor
Q. Endrin ketone
R. Endrin aldehyde
S. alpha-Chlordane
T. gamma-Chlordane
U. Toxaphene
V. Aroclor-1016
W. Aroclor-1221
X. Aroclor-1232
Y. Aroclor-1242
Z. Aroclor-1248
AA. Aroclor-1254
BB. Aroclor-1260
CC. 2,4'-DDD
DD. 2,4'-DDE
EE. 2,4'-DDT
FF. Hexachlorobenzene
GG. Chlordane
HH. Chlordane (Tech)
II. Aroclor 1262
JJ. Aroclor 1268
KK. Oxychlordane
LL. trans- Nonachlor
MM. cis-Nonachlor
NN. ____________
OO. ____________
PP. ____________
QQ. ____________
RR. ____________
SS. ____________

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: July 9, 2024

Parameters: Polychlorinated Dioxins/Dibenzofurans

Validation Level: Stage 2B & 4

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 24E0642

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-SG-148-0-1-20240529**	24E0642-01**	Sediment	05/29/24
JW-RB-20240529	24E0642-02	Water	05/29/24

**Indicates sample underwent Stage 4 validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for High Resolution Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Dioxins/Dibenzofurans by Environmental Protection Agency (EPA) Method 1613B

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Stage 4 data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The reported result was an estimated quantity value.

U (Non-detected): The analyte was analyzed for, but was not detected above the level of the adjusted detection limit or quantitation limit, as appropriate.

UJ (Non-detected): The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

NJ (Tentatively identified): The analyte has been "tentatively identified" or "presumptively identified" as present, and the associated numerical value was the estimated concentration in the sample.

R (Rejected): The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other

I. Sample Receipt and Technical Holding Times

The chain-of-custodies were reviewed for documentation of temperatures. Although the cooler temperatures for all samples were reported at/between 8.2°C upon receipt by the laboratory, using professional judgment, no data was qualified based on these cooler temperatures since the compounds are not expected to degrade significantly during shipping or storage.

All technical holding time requirements were met.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25%.

The static resolving power was at least 10,000 (10% valley definition).

III. Initial Calibration and Initial Calibration Verification

A five point initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all analytes and less than or equal to 35.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The minimum S/N ratio was greater than or equal to 10 for each analyte and labeled compound associated to samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

The percent differences (%D) of the initial calibration verification (ICV) standard were within the QC limits for all analytes and labeled compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration results were within the QC limits for all analytes and labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The minimum S/N ratio was greater than or equal to 10 for each analyte and labeled compound associated to samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Analyte	Concentration	Associated Samples
BMF0088-BLK1	06/11/24	Total HxCDD	0.145 (ng/Kg)	JW-SG-148-0-1-20240529**
BMF0077-BLK1	06/04/24	OCDD	6.87 (pg/L)	JW-RB-20240529

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks.

VI. Field Blanks

Sample JW-RB-20240529 was identified as a rinse blank. No contaminants were found.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples/Standard Reference Materials

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

Standard reference materials (SRM) were analyzed as required by the method. The results were within QC limits with the following exceptions:

SRM ID	Analyte	%R (50-150)	Associated Samples	Flag	A or P
BMF0088-SRM1	1,2,3,7,8,9-HxCDF	198	JW-SG-148-0-1-20240529**	NA	-

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Labeled Compounds

All percent recoveries (%R) for labeled compounds used to quantitate target analytes were within QC limits.

XI. Target Analyte Quantitation

All target analyte quantitations were within validation criteria with the following exceptions:

Sample	Analyte	Flag	A or P
JW-SG-148-0-1-20240529**	All analytes reported by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A

Raw data were not reviewed for Stage 2B validation.

XII. Target Analyte Identification

All target analyte identifications met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Data qualified due to results reported by the laboratory as EMPCs are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Data Qualification Summary - SDG 24E0642

Sample	Analyte	Flag	A or P	Reason (Code)
JW-SG-148-0-1-20240529**	All analytes reported by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A	Target analyte quantitation (EMPC) (23)

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG 24E0642

No Sample Data Qualified in this SDG

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG 24E0642

No Sample Data Qualified in this SDG

LDC #: 59293B21 **VALIDATION COMPLETENESS WORKSHEET** Date: 07/02/24
SDG #: 24E0642 Stage 2B/4 Page: 1 of 1
Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer: JV6
2nd Reviewer: [signature]

METHOD: HRGC/HRMS Polychlorinated Dioxins/Dibenzofurans (EPA Method 1613B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	SW/A	Cooler temp = 8.2°C (received same day, insufficient time to cool)
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	RSD ≤ 20/35% ICV ≤ QC limits
IV.	Continuing calibration	A	CCV ≤ QC limits
V.	Laboratory Blanks	SW	
VI.	Field blanks	ND	RB = 2
VII.	Matrix spike/Matrix spike duplicates	N	CS
VIII.	Laboratory control samples	SW	LCS SRM
IX.	Field duplicates	N	
X.	Labeled Compounds	A	
XI.	Target analyte quantitation	SW	Not reviewed for Stage 2B validation.
XII.	Target analyte identification	A	Not reviewed for Stage 2B validation.
XIII	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Stage 4 validation

	Client ID	Lab ID	Matrix	Date
1	JW-SG-148-0-1-20240529**	24E0642-01**	Sediment	05/29/24
2	JW-RB-20240529	24E0642-02	Water	05/29/24
3				
4				
5				
6				
7				
8				
9				
10				
11				

Notes:

1	BMF0088-Blk1						
2	BMF0077- ↓						

Method: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	√			
Cooler temperature criteria was met.		√		
II. GC/MS Instrument performance check				
Was PFK exact mass 380.9760 verified?	√			
Were the retention time windows established for all homologues?	√			
Was the chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomers ≤ 25% ?	√			
Is the static resolving power at least 10,000 (10% valley definition)?	√			
Was the mass resolution adequately check with PFK?	√			
Was the presence of 1,2,8,9-TCDD and 1,3,4,6,8-PeCDF verified?	√			
IIIa. Initial calibration				
Was the initial calibration performed at 5 concentration levels?	√			
Were all percent relative standard deviations (%RSD) ≤ 20% for unlabeled compounds and ≤ 35% for unlabeled compounds?	√			
Did all calibration standards meet the Ion Abundance Ratio criteria?	√			
Was the signal to noise ratio for each target compound and labeled compound ≥ 10?	√			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	√			
Were all concentrations for the unlabeled compounds and for labeled compounds within QC limits?	√			
IV. Continuing calibration				
Was a continuing calibration performed at the beginning of each 12 hour period?	√			
Were all concentrations for the unlabeled compounds and for labeled compounds within QC limits (Method 1613B, Table 6)?	√			
Did all continuing calibration standards meet the Ion Abundance Ratio criteria?	√			
V. Blanks				
Was a method blank associated with every sample in this SDG?	√			
Was a method blank performed for each matrix and whenever a sample extraction was performed?	√			
Was there contamination in the method blanks?	√			
VI. Field blanks				
Were field blanks identified in this SDG?	√			
Were target analytes detected in the field blanks?		√		
VII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?		√		
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			√	

Validation Area	Yes	No	NA	Findings/Comments
VIII. Laboratory control samples				
Was an LCS analyzed per extraction batch?	√			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		√		
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?		√		
Were target analytes detected in the field duplicates?			√	
X. Labeled compounds				
Were labeled compounds within QC limits (Method 1613B, Table 7)?	√			
Was the minimum S/N ratio of all labeled compound peaks ≥ 10?	√			
XI. Target analyte quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	√			
Were the correct labeled compound, quantitation ion and relative response factor (RRF) used to quantitate the analyte?	√			
Were target analyte quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	√			
XII. Target analyte identification				
For 2,3,7,8 substituted congeners with associated labeled standards, were the retention times of the two quantitation peaks within -1 to 3 sec. of the RT of the labeled standard?	√			
For 2,3,7,8 substituted congeners without associated labeled standards, were the relative retention times of the two quantitation peaks within 0.005 time units of the RRT measured in the routine calibration?	√			
For non-2,3,7,8 substituted congeners, were the retention times of the two quantitation peaks within RT established in the performance check solution?	√			
Did analyte spectra contain all characteristic ions listed in the table attached?	√			
Was the Ion Abundance Ratio for the two quantitation ions within criteria?		√		EMPC
Was the signal to noise ratio for each target analyte ≥2.5 and ≥10 for the labeled compound?	√			
Does the maximum intensity of each specified characteristic ion coincide within ± 2 seconds (includes labeled standards)?	√			
For PCDF identification, was any signal (S/N ≥ 2.5, at ± seconds RT) detected in the corresponding PCDPE channel?	√			
Was an acceptable lock mass recorded and monitored?	√			
Were manual integrations reviewed and found acceptable?			√	
Did the laboratory provide before and after integration printouts?			√	
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	√			

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

A. 2,3,7,8-TCDD	F. 1,2,3,4,6,7,8-HpCDD	K. 1,2,3,4,7,8-HxCDF	P. 1,2,3,4,7,8,9-HpCDF	U. Total HpCDD
B. 1,2,3,7,8-PeCDD	G. OCDD	L. 1,2,3,6,7,8-HxCDF	Q. OCDF	V. Total TCDF
C. 1,2,3,4,7,8-HxCDD	H. 2,3,7,8-TCDF	M. 2,3,4,6,7,8-HxCDF	R. Total TCDD	W. Total PeCDF
D. 1,2,3,6,7,8-HxCDD	I. 1,2,3,7,8-PeCDF	N. 1,2,3,7,8,9-HxCDF	S. Total PeCDD	X. Total HxCDF
E. 1,2,3,7,8,9-HxCDD	J. 2,3,4,7,8-PeCDF	O. 1,2,3,4,6,7,8-HpCDF	T. Total HxCDD	Y. Total HpCDF

Notes:_____

LDC #: 59293B21

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: JVG

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a method blank?

Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?

Y N N/A Was the method blank contaminated?

Blank extraction date: 06/11/24 **Blank analysis date:** 06/15/24 **Associated samples:** 1 (>5x)

Conc. units: ng/kg

Compound	Blank ID	Sample Identification								
	BMF0088-BLK1									
T	0.145									

Blank extraction date: 06/04/24 **Blank analysis date:** 06/14/24

Conc. units: pg/L Associated Samples: 2 (ND)

Compound	Blank ID	Sample Identification								
	BMF0077-BLK1									
G	6.87									

LDC #: 59293B21

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS) /SRM

Page: 1 of 1
Reviewer: JVG

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

Y [✓ N] N/A Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

#	LCS/LCSD ID	Compound	SRM ~~LCS~~ %R	LCSD %R	%R Limits	RPD (Limits)	Associated Samples	(10) Qualifications
	BMF0088-SRM1	N	198		50-150	( )	1, MB1 (ND)	J dets /P
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
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LDC #: 59293B21

VALIDATION FINDINGS WORKSHEET
Target Analyte Quantitation and Reported RLs

Reviewer: JVG

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the analyte?

Y N N/A Were analyte quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors (if necessary)?

#	Date	Associated Samples	Analyte	Finding	Qualifications
		1	-	All analytes reported as estimated maximum possible concentration (EMPC).	Jdets/A (23)

Note; No dilution performed

LDC #: 59293B21

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: JVG

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of Compound
C_x = Concentration of compound,
S= Standard deviation of the RRFs,

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard
X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)		Reported RRF	Recalculated RRF	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL Autospec01 HB00095	2/28/2024	2,3,7,8-TCDF	(13C-2,3,7,8-TCDF)	1.020	1.020	0.980	0.980	5.4	5.4
			2,3,7,8-TCDD	(13C-2,3,7,8-TCDD)	1.179	1.179	1.227	1.227	4.0	4.0
			1,2,3,6,7,8-HxCDD	(13C-1,2,3,6,7,8-HxCDD)	0.855	0.855	0.833	0.833	4.9	4.9
			1,2,3,4,6,7,8-HpCDF	(13C-1,2,4,6,7,8,-HpCDF)	1.400	1.400	1.392	1.392	3.5	3.5
			OCDD	(13C-OCDD)	0.845	0.845	0.938	0.938	6.9	6.9

LDC# 59293B21

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = (Ax)(Cis)/(Ais)(Cx)

Where:
ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
Ax = Area of compound,
Cx = Concentration of compound,
Ais = Area of associated internal standard
Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Ref IS)	Average RRF (Initial)	Reported RRF (CCV)	Recalculated RRF (CCV)	Reported % D	Recalculated %D
1	SMF0205-ICV1	6/18/2024	2,3,7,8-TCDF (13C-2,3,7,8-TCDF)	0.9802	0.8954	0.8954	8.6	8.6
			2,3,7,8-TCDD (13C-2,3,7,8-TCDD)	1.2269	1.1971	1.1971	2.4	2.4
			1,2,3,6,7,8-HxCDD (13C-1,2,3,6,7,8-HxCDD	0.8327	0.8778	0.8778	5.4	5.4
			1,2,3,4,6,7,8-HpCDF (13C-1,2,4,6,7,8,-HpCDF	1.3924	1.3502	1.3502	3.0	3.0
			OCDD (13C-OCDD)	0.9375	0.8795	0.8795	6.2	6.2

LDC # 59293B21

VALIDATION FINDINGS WORKSHEET
LCS/OPR Results Verification

Reviewer: JVG

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control duplicate were recalculated for the compounds identified below using the following calculation:

SSC = (Area spike) (Conc IS) / (Area IS) (average RRF spike)
%Recovery = 100 * SSC/SA

Where:
SSC = Spiked concentration
SA = Spike added
LCS = Laboratory control spike recovery
LCSD = Laboratory control spike duplicate recovery

RPD = | LCS - LCSD | * 2/(LCS + LCSD)

LCS/LCSD ID: BMF0088-BS1

Compound	SA (pg/g)		SSC (pg/g)		LCS Percent Recovery		LCSD Percent Recovery		LCS/D RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
2,3,7,8-TCDD	20		19.4	NA	96.8	97.0				
1,2,3,7,8-PeCDD	100		99.1		99.1	99.1				
1,2,3,4,7,8-HxCDD	100		107		107	107				
1,2,3,4,7,8,9-HpCDF	100		96.7		96.7	96.7				
OCDF	200		160		79.9	80.0				

VALIDATION FINDINGS WORKSHEET
Sample Results Verification

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

Analyte results for all Level IV samples reported with a positive detect were recalculated and verified using the following equation:

$$\text{Concentration} = \frac{(Ax)(Cis)(Ve)(DF)}{(Ais)(RRF)(Vi)(\%S)}$$

Ax	Area of the characteristic ion (EICP) for the analyte to be measured
Ais	Area of the characteristic ion (EICP) for the specific internal standard
Cis	Amount of internal standard added in nanograms (ng)
Ve	Volume or weight of sample extract in mcroliters (ul)
Vi	Initial volume or weight of sample in milliliters (ml) or grams (g).
RRF	Relative Response Factor (average) from the initial calibration
Df	Dilution Factor.
%S	Percent solids, applicable to soil and solid matrices only.

Sample #	Compound	Ax	Ai	Ci (pg)	RRF	DF	Ve (uL)	Vi (g)	% Solids	Calculated Concentration (ng/Kg)	Reported Concentration (ng/Kg)	% Diff
1	OCDD	1.03E+06	3.50E+05	200	0.938	1.00	20.00	19.04	0.525	1261	1260	0

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Anchor QEA, LLC
1201 Third Ave. Suite 2600
Seattle, WA 98101
ATTN: Ms. Delaney Peterson
dpeterson@anchorqea.com

September 19, 2024

SUBJECT: Jeld-Wen - Data Validation

Dear Ms. Peterson,

Enclosed are the final validation reports for the fractions listed below. This SDG was received on August 29, 2024. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #59605:

SDG #	Fraction
24E0712	Polynuclear Aromatic Hydrocarbons, Polychlorinated Dioxins/Dibenzofurans, Polychlorinated Biphenyls

The data validation was performed under Stage 2B & 4 guidelines. The analysis was validated using the following documents, as applicable to each method:

- Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023)
- USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020)
- USEPA National Functional Guidelines (NFG) for High Resolution Superfund Methods Data Review (November 2020)
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Stella Cuenco
scuenco@lab-data.com
Project Manager/Senior Chemist

Stage 2B (Diox 90/10) EDD

LDC# 59605 (Anchor Environmental - Seattle, WA / Jeld-Wen)

LDC	SDG#	DATE REC'D	(3) DATE DUE	PAHs (8270E -SIM)		PCBs (8082A)		Dioxins (1613B)																													
Matrix:	Water/Solid-Sediment			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	24E0712	08/29/24	09/20/24	1	0	0	2	1	1																												
A	24E0712	08/29/24	09/20/24	0	0	0	0	0	1																												
Total	TR/SC			1	0	0	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS, MSD, or DUP's.

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: September 11, 2024

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 24E0712

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-RB-20240530	24E0712-11	Water	05/30/24

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270E in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The reported result was an estimated quantity value.

U (Non-detected): The analyte was analyzed for, but was not detected above the level of the adjusted detection limit or quantitation limit, as appropriate.

UJ (Non-detected): The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

NJ (Tentatively identified): The analyte has been "tentatively identified" or "presumptively identified" as present, and the associated numerical value was the estimated concentration in the sample.

R (Rejected): The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check was performed at the required frequency.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For analytes where average relative response factors (RRFs) were utilized, percent relative standard deviations (%RSD) were less than or equal to 20.0%.

Average relative response factors (RRF) for all analytes were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all analytes.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all analytes.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample JW-RB-20240530 was identified as a rinsate blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Surrogate	%R (Limits)	Affected Analyte	Flag	A or P
JW-RB-20240530	Dibenzo(a,h)anthracene-d14 Phenanthrene-d10	124 (29-120) 134 (57-120)	All analytes	NA	-

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Target Analyte Quantitation

Raw data were not reviewed for Stage 2B validation.

XIII. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Jeld-Wen
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 24E0712

No Sample Data Qualified in this SDG

Jeld-Wen
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 24E0712

No Sample Data Qualified in this SDG

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG 24E0712

No Sample Data Qualified in this SDG

LDC #: 59605A2b

SDG #: 24E0712

Laboratory: Analytical Resources, Inc., Tukwila, WA

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

Date: 9/9/24

Page: 1 of 1

Reviewer: FC

2nd Reviewer:

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW-846 Method 8270E-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	%RSD ≤ 20 ICV ≤ 30
IV.	Continuing calibration	A	CCV ≤ 20
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	RB = 1
VII.	Surrogate spikes	SW	
VIII.	Matrix spike/Matrix spike duplicates	N	QC sample
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Target analyte quantitation	N	
XIII.	Target analyte identification	N	
XIV	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	JW-RB-20240530	24E0712-11	Water	05/30/24
2				
3				
4				
5				
6				
7				
8				
9				
10				

Notes:

BM F0039

LDC #: 59605A2b

VALIDATION FINDINGS WORKSHEET

Surrogate Recovery

Page: 1 of 1

Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270 E)

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A — Were percent recoveries (%R) for surrogates within QC limits?

Y N N/A — If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?

Y N (N/A) — If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Sample ID	Surrogate	%R (Limits)	Qualifications
	1	KKK-d14	124 (29-120)	J det/A ND
		UU-d10	134 (57-120)	↓
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
	sample was	re-extracted + re-analyzed	( )	
			( )	

(NBZ) = Nitrobenzene - d5
(FBP) = 2-Fluorobiphenyl
(TPH) = Terphenyl - d14
(2FP) = 2-Fluorophenol
(TBP) = 2,4,6 -Tribromophenol
(2CP) = 2-Chlorophenol - d4

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: September 11, 2024

Parameters: Polychlorinated Biphenyls

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 24E0712

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-SG-Comp-N-20240530	24E0712-09	Sediment	05/30/24
JW-SG-Comp-S-20240530	24E0712-10	Sediment	05/30/24
JW-SG-Comp-S-20240530MS	24E0712-10MS	Sediment	05/30/24
JW-SG-Comp-S-20240530MSD	24E0712-10MSD	Sediment	05/30/24

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The reported result was an estimated quantity value.

U (Non-detected): The analyte was analyzed for, but was not detected above the level of the adjusted detection limit or quantitation limit, as appropriate.

UJ (Non-detected): The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

NJ (Tentatively identified): The analyte has been "tentatively identified" or "presumptively identified" as present, and the associated numerical value was the estimated concentration in the sample.

R (Rejected): The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all analytes.

In the case where the laboratory used a calibration curve to evaluate the analytes, all coefficients of determination (r^2) were greater than or equal to 0.990.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all analytes.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all analytes.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Surrogates/Internal Standards

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

All internal standard areas and retention times were within QC limits with the following exceptions:

Sample	Internal Standards	Area (605302-2421206)	Affected Analyte	Flag	A or P
JW-SG-Comp-N-20240530	Hexabromobiphenyl	581612	Aroclor-1254 Aroclor-1260 Aroclor-1262 Aroclor-1268	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Target Analyte Quantitation

Raw data were not reviewed for Stage 2B validation.

XI. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Data qualified due to internal standard area are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polychlorinated Biphenyls - Data Qualification Summary - SDG 24E0712

Sample	Analyte	Flag	A or P	Reason (Code)
JW-SG-Comp-N-20240530	Aroclor-1254 Aroclor-1260 Aroclor-1262 Aroclor-1268	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P	Internal standards (area) (19)

Jeld-Wen
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG 24E0712

No Sample Data Qualified in this SDG

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG 24E0712

No Sample Data Qualified in this SDG

LDC #: 59605A3b
SDG #: 24E0712
Laboratory: Analytical Resources, Inc., Tukwila, WA

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 9/9/24
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Polychlorinated Biphenyls (EPA SW-846 Method 8082A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	%RSD ≤ 20, r² ICV ≤ 20
III.	Continuing calibration	A	CCV
IV.	Laboratory Blanks	A	
V.	Field blanks	N	
VI.	Surrogate spikes	A/SW	A/SW
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS/LCSD
IX.	Field duplicates	N	
X.	Target analyte quantitation	N	
XI.	Target analyte identification	N	
XII.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	JW-SG-Comp-N-20240530	24E0712-09	Sediment	05/30/24
2	JW-SG-Comp-S-20240530	24E0712-10	Sediment	05/30/24
3	JW-SG-Comp-S-20240530MS	24E0712-10MS	Sediment	05/30/24
4	JW-SG-Comp-S-20240530MSD	24E0712-10MSD	Sediment	05/30/24
5				
6				
7				
8				
9				
10				
11				
12				
13				

Notes:

	BMF0042						

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG. Chlordane
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH. Chlordane (Technical)
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II. Aroclor 1262
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ. Aroclor 1268
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. 2,4'-DDD	KK. Oxychlordane
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. 2,4'-DDE	LL. trans-Nonachlor
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE. 2,4'-DDT	MM. cis-Nonachlor
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF. Hexachlorobenzene	NN.

Notes:_____

LDC #: 59605A3b

VALIDATION FINDINGS WORKSHEET
Internal Standards

Reviewer: F

METHOD: GC PCBs (EPA SW 846 Method 8082)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". (19)

Y (N) N/A Were all internal standard area counts within -50 to +100 of the associated calibration standard?

Y (N) N/A Were the retention times of the internal standards within +/- 30 seconds of the retention times of the associated calibration standard?

#	Sample ID	Internal Standard	Column	Area (Limits)	RT (Limits)	Qualifications
	1	*	Col 1	581612 (605302 - 242/206)		J/NJ/P (ND) qual AA BB II, JJ
		* Hexabromobiphenyl				

BNB = 1-Bromo-2-nitrobenzene
HBB = Hexabromobiphenyl

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: September 11, 2024

Parameters: Polychlorinated Dioxins/Dibenzofurans

Validation Level: Stage 2B & 4

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 24E0712

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-SG-Comp-N-20240530**	24E0712-09**	Sediment	05/30/24
JW-SG-Comp-S-20240530	24E0712-10	Sediment	05/30/24
JW-RB-20240530	24E0712-11	Water	05/30/24
JW-SG-Comp-N-20240530DUP	24E0712-09DUP	Sediment	05/30/24

**Indicates sample underwent Stage 4 validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for High Resolution Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Dioxins/Dibenzofurans by Environmental Protection Agency (EPA) Method 1613B

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Stage 4 data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The reported result was an estimated quantity value.

U (Non-detected): The analyte was analyzed for, but was not detected above the level of the adjusted detection limit or quantitation limit, as appropriate.

UJ (Non-detected): The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

NJ (Tentatively identified): The analyte has been "tentatively identified" or "presumptively identified" as present, and the associated numerical value was the estimated concentration in the sample.

R (Rejected): The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25%.

The static resolving power was at least 10,000 (10% valley definition).

III. Initial Calibration and Initial Calibration Verification

A five point initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all analytes and less than or equal to 35.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The minimum S/N ratio was greater than or equal to 10 for each analyte and labeled compound associated to samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

The percent differences (%D) of the initial calibration verification (ICV) standard were within the QC limits for all analytes and labeled compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration results were within the QC limits for all analytes and labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The minimum S/N ratio was greater than or equal to 10 for each analyte and labeled compound associated to samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Analyte	Concentration	Associated Samples
BMF0077	06/04/24	OCDD	6.87 pg/L	All water samples in SDG 24E0712
BMF0490	06/21/24	OCDD	1.09 ng/Kg	All sediment samples in SDG 24E0712

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks.

VI. Field Blanks

Sample JW-RB-20240530 was identified as a rinsate blank. No results were detected in any of the samples.

VII. Matrix Spike/Matrix Spike Duplicates/Laboratory Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

Laboratory duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (≤35)	Flag	A or P
JW-SG-Comp-N-20240530DUP (JW-SG-Comp-N-20240530**)	1,2,3,4,7,8-HxCDF	43.8	J (all detects)	A
	2,3,4,6,7,8-HxCDF	81.2	J (all detects)	
	1,2,3,6,7,8-HxCDD	72.0	J (all detects)	
	1,2,3,7,8,9-HxCDD	65.2	J (all detects)	
	1,2,3,4,6,7,8-HpCDF	44.4	J (all detects)	
	1,2,3,4,6,7,8-HpCDD	51.9	J (all detects)	
	OCDD	41.2	J (all detects)	
	Total PeCDF	40.2	J (all detects)	
	Total HxCDF	51.4	J (all detects)	
	Total HxCDD	83.5	J (all detects)	
	Total HpCDF	74.9	J (all detects)	
	Total HpCDD	52.2	J (all detects)	

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Labeled Compounds

All percent recoveries (%R) for labeled compounds used to quantitate target analytes were within QC limits.

XI. Target Analyte Quantitation

All target analyte quantitations were within validation criteria with the following exceptions:

Sample	Analyte	Flag	A or P
All samples in SDG 24E0712	All analytes reported by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A

Sample	Analyte	Finding	Criteria	Flag	A or P
JW-SG-Comp-N-20240530** JW-SG-Comp-S-20240530	OCDD	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A

Raw data were not reviewed for Stage 2B validation.

XII. Target Analyte Identification

All target analyte identifications met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Data qualified due to DUP RPD, results reported by the laboratory as EMPCs, and results exceeded calibration range are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Data Qualification Summary - SDG 24E0712

Sample	Analyte	Flag	A or P	Reason (Code)
JW-SG-Comp-N-20240530**	1,2,3,4,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD Total PeCDF Total HxCDF Total HxCDD Total HpCDF Total HpCDD	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Laboratory duplicates (RPD) (9)
JW-SG-Comp-N-20240530** JW-SG-Comp-S-20240530 JW-RB-20240530	All analytes reported by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A	Target analyte quantitation (EMPC) (23)
JW-SG-Comp-N-20240530** JW-SG-Comp-S-20240530	OCDD	J (all detects)	P	Target analyte quantitation (exceeded range) (20)

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG 24E0712

No Sample Data Qualified in this SDG

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG 24E0712

No Sample Data Qualified in this SDG

LDC #: 59605A21 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/9/24
SDG #: 24E0712 Stage 2B/4 Page: 1 of 1
Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer:
2nd Reviewer:

METHOD: HRGC/HRMS Polychlorinated Dioxins/Dibenzofurans (EPA Method 1613B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	HRGC/HRMS Instrument performance check	A	QC limit
III.	Initial calibration/ICV	A/A	%RSD ≤20/35 ICV ≤QC
IV.	Continuing calibration	A	CCV ≤ QC limit
V.	Laboratory Blanks	SW	
VI.	Field blanks	ND	RB = 3
VII.	Matrix spike/Matrix spike duplicates /DUP	N	CS
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Labeled Compounds	A	
XI.	Target analyte quantitation	SW	Not reviewed for Stage 2B validation.
XII.	Target analyte identification	A	Not reviewed for Stage 2B validation.
XIII.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Stage 4 validation

	Client ID	Lab ID	Matrix	Date
1 1	JW-SG-Comp-N-20240530**	24E0712-09**	Sediment	05/30/24
2 1	JW-SG-Comp-S-20240530	24E0712-10	Sediment	05/30/24
3 2	JW-RB-20240530	24E0712-11	Water	05/30/24
4	JW-SG-Comp-N-20240530DUP	24E0712-09DUP	Sediment	05/30/24
5				
6				
7				
8				
9				
10				
11				

Notes:

1	BMF0490						
2	BMF0077						

LDC #: 59605A21

VALIDATION FINDINGS CHECKLIST

Reviewer: FT
2nd Reviewer: AC

Method: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Was PFK exact mass 380.9760 verified?	✓			
Were the retention time windows established for all homologues?	✓			
Was the chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomers ≤ 25% ?	✓			
Is the static resolving power at least 10,000 (10% valley definition)?	✓			
Was the mass resolution adequately check with PFK?	✓			
Was the presence of 1,2,8,9-TCDD and 1,3,4,6,8-PeCDF verified?	✓			
IIIa. Initial calibration				
Was the initial calibration performed at 5 concentration levels?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20% for unlabeled analytes and ≤ 35% for labeled analytes ?	✓			
Did all calibration standards meet the Ion Abundance Ratio criteria?	✓			
Was the signal to noise ratio for each target compound ≥ 2.5 and for each recovery and internal standard ≥ 10?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all concentration for unlabeled and labeled analytes within QC limits?	✓			
IV. Continuing calibration				
Was a contiuning calibration performed at the beginning and end of each 12 hour period?	✓			
Were all concentration for unlabeled and labeled analytes within QC limits?	✓			
Did all routine calibration standards meet the Ion Abundance Ratio criteria?	✓			
Was the signal to noise ratio for each target compound and for each recovery and internal standard ≥ 10?	✓			
V. Laboratory Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank performed for each matrix and whenever a sample extraction was performed?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet?	✓			
VI. Field blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.		✓		
VII. Matrix spike/Matrix spike duplicates				

LDC #: 59605A21

VALIDATION FINDINGS CHECKLIST

Reviewer: FT
2nd Reviewer: [illegible]

Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.			✓	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
VIII. Laboratory control samples				
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.			✓	
Target compounds were detected in the field duplicates.			✓	
X. Internal standards				
Were internal standard recoveries within the ~~40-135~~ QC% criteria?	✓			
Was the minimum S/N ratio of all internal standard peaks ≥ 10?	✓			
XI. Compound quantitation				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XII. Target compound identification				
For 2,3,7,8 substituted congeners with associated labeled standards, were the retention times of the two quantitation peaks within -1 to 3 sec. of the RT of the labeled standard?	✓			
For 2,3,7,8 substituted congeners without associated labeled standards, were the relative retention times of the two quantitation peaks within 0.005 time units of the RRT measured in the routine calibration?	✓			
For non-2,3,7,8 substituted congeners, were the retention times of the two quantitation peaks within RT established in the performance check solution?	✓			
Did compound spectra contain all characteristic ions listed in the table attached?	✓			
Was the Ion Abundance Ratio for the two quantitation ions within criteria?	✓			
Was the signal to noise ratio for each target compound and labeled standard ≥ 2.5?	✓			
Does the maximum intensity of each specified characteristic ion coincide within ± 2 seconds (includes labeled standards)?	✓			
For PCDF identification, was any signal (S/N ≥ 2.5, at ± seconds RT) detected in the corresponding PCDPE channel?	✓			
Was an acceptable lock mass recorded and monitored?	✓			
XIII. System performance				
System performance was found to be acceptable.	✓			
XIV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

A. 2,3,7,8-TCDD	F. 1,2,3,4,6,7,8-HpCDD	K. 1,2,3,4,7,8-HxCDF	P. 1,2,3,4,7,8,9-HpCDF	U. Total HpCDD
B. 1,2,3,7,8-PeCDD	G. OCDD	L. 1,2,3,6,7,8-HxCDF	Q. OCDF	V. Total TCDF
C. 1,2,3,4,7,8-HxCDD	H. 2,3,7,8-TCDF	M. 2,3,4,6,7,8-HxCDF	R. Total TCDD	W. Total PeCDF
D. 1,2,3,6,7,8-HxCDD	I. 1,2,3,7,8-PeCDF	N. 1,2,3,7,8,9-HxCDF	S. Total PeCDD	X. Total HxCDF
E. 1,2,3,7,8,9-HxCDD	J. 2,3,4,7,8-PeCDF	O. 1,2,3,4,6,7,8-HpCDF	T. Total HxCDD	Y. Total HpCDF

Notes:_____

LDC #: 59605 A21

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: FT

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
Y N N/A Was the method blank contaminated?

Blank extraction date: 6/4/24 **Blank analysis date:** 6/14/24 **Associated samples:** all water ND

Conc. units: pg/L

Compound	Blank ID	Sample Identification								
	MBL									
G	6.87									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 59605 A21

VALIDATION FINDINGS WORKSHEET
Blanks

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
Y N N/A Was the method blank contaminated?

Blank extraction date: 6/21/24 **Blank analysis date:** 8/26/24 **Associated samples:** all sediment >5X

Conc. units: ng/kg

Compound	Blank ID		Sample Identification							
	MB1	5X								
G	1.09	5.45								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 59605A21

VALIDATION FINDINGS WORKSHEET
Lab Duplicate Analysis

METHOD: 1613B

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y Was a duplicate sample analyzed for each matrix in this SDG?

N Were all duplicate sample relative percent differences (RPD) ≤ 35% ?

LEVEL IV ONLY:

Y Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Lab Duplicates	Matrix	Compound	RPD (Limits ≤ 35%)	Associated Samples	Qualifications
	1 & 4	sediment	K	43.8	1	Jdet/A
			M	81.2		
			D	72.0		
			E	65.2		
			O	44.4		
			F	51.9		
			G	41.2		
			W	40.2		
			X	51.4		
			T	83.5		
			Y	74.9		
			U	52.2		

Comments: _____

LDC #: 59605A21

VALIDATION FINDINGS WORKSHEET
Target Analyte Quantitation

Reviewer: FT

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the compound?
Y N N/A Compound quantitation and CRQLs were adjusted to reflect all sample dilutions and dry weight factors (if necessary).

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		All	All analytes qualified as EMPC by the laboratory		Jdü/A
		1, 2	G - x'd cal Range		Jdü/P

Comments: See sample calculation verification worksheet for recalculations

LDC #: 59605A3

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs,

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard
X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported RRF (CS3 std) 10/50/100	Recalculated RRF (CS3 std)	Reported %RSD	Recalculated %RSD
1	ICAL	02/28/24	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.9801617	0.9801617	1.020004	1.020004	5.4	5.4
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.226914	1.226914	1.178937	1.178937	4.0	4.0
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	0.8327394	0.8327394	0.8550819	0.8550819	4.9	4.9
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	0.9843566	0.9843566	0.9459153	0.9459153	6.7	6.7
			OCDF (^{13}C-OCDD)	1.222295	1.222295	1.088647	1.088647	14.4	14.4
2			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)						
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)						
			OCDF (^{13}C-OCDD)						
3			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)						
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)						
			OCDF (^{13}C-OCDD)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 59665A21

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	True Amount (initial)	Reported Amount (CC)	Recalculated Amount (CC)	Reported %D	Recalculated %D
1	CCV	8/26/24 1033	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	10.0	8.85	8.85	11.5	11.5
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	10.0	9.30	9.30	7.0	7.0
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	50.0	52.90	52.90	5.7	5.7
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	50.0	50.6	50.6	1.2	1.2
			OCDF (^{13}C-OCDD)	100	82.2	82.2	17.8	17.8
2			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)					
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)					
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)					
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)					
			OCDF (^{13}C-OCDD)					
3			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)					
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)					
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)					
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)					
			OCDF (^{13}C-OCDD)					

Comments: Refer to Routine Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 59605A21

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: FT

METHOD: GC/MS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration
SA = Spike added

RPD = I LCS - LCSD I * 2/(LCS + LCSD) LCS = Laboraotry control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS ID: BMF0490 ng

Compound	Spike Added (ng/kg)		Spiked Sample Concentration (ng/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalc
2,3,7,8-TCDD	20.0	NA	18.2	NA	91.2	91.2				
1,2,3,7,8-PeCDD	100		99.5		99.5	99.5				
1,2,3,4,7,8-HxCDD	100		97.5		97.5	97.5				
1,2,3,4,7,8,9-HpCDF	100		100		100	100				
OCDF	200		155		77.7	77.7				

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 59605A21

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

(Y) N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

RRF = Relative Response Factor (average) from the initial calibration

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

Example:

Sample I.D. #1, OCDF:

Conc. $= \frac{(6.072 \times 10^3 + 6.895 \times 10^3)(200)(20)}{(1.256 \times 10^4 + 1.430 \times 10^4)(1.223295)(13.33)(0.7502)}$

$= 157.98$ ng/kg

#	Sample ID	Compound	Reported Concentration (ng/kg)	Calculated Concentration (ng/kg)	Qualification
	#1	OCDF	158	157.98	

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Anchor QEA, LLC
1201 Third Ave. Suite 2600
Seattle, WA 98101
ATTN: Ms. Delaney Peterson
dpeterson@anchorqea.com

October 2, 2024

SUBJECT: Jeld-Wen - Data Validation

Dear Ms. Peterson,

Enclosed are the final validation reports for the fractions listed below. This SDG was received on August 30, 2024. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #59625:

SDG #	**Fraction**
24F0117, 24F0161, 24G0480/10702949, 24G0501/10702945, 24G0502/10702950	Polynuclear Aromatic Hydrocarbons, Polychlorinated Dioxins/Dibenzofurans, Polychlorinated Biphenyls

The data validation was performed under Stage 2B & 4 guidelines. The analysis was validated using the following documents, as applicable to each method:

- Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023)
- USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020)
- USEPA National Functional Guidelines (NFG) for High Resolution Superfund Methods Data Review (November 2020)
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014; update VI, July 2018

Please feel free to contact us if you have any questions.

Sincerely,

Stella Cuenco
scuenco@lab-data.com
Project Manager/Senior Chemist

1,835 pages-ADV

Attachment 1

Stage 2B (Diox 90/10) EDD

LDC# 59625 (Anchor Environmental - Seattle, WA / Jeld-Wen)

LDC	SDG#	DATE REC'D	(3) DATE DUE	PAHs (8270E-SIM)		PCBs (8082A)		Dioxins (1613B)																													
Matrix: Water/Solid-Sediment				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	24F0117	08/30/24	09/23/24	1	4	1	9	2	6																												
B	24F0161	08/30/24	09/23/24	0	3	-	-	0	4																												
C	24G0480/10702949	08/30/24	09/23/24	-	-	1	0	1	20																												
D	24G0501/10702945	08/30/24	09/23/24	-	-	0	8	0	22																												
D	24G0501/10702945	08/30/24	09/23/24	-	-	0	0	0	6																												
E	24G0502/10702950	08/30/24	09/23/24	-	-	1	4	1	0																												
Total	TR/SC			1	7	3	21	4	58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	94

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS, MSD, or DUP's.

V:\LOGIN\Anchor\Jeld Wen\59625ST-ARI.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: September 19, 2024

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 24F0117

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-SG-144-0-1-20240604	24F0117-02	Sediment	06/04/24
JW-FB-20240605	24F0117-07	Water	06/05/24
JW-SG-146-0-1-20240605	24F0117-19	Sediment	06/05/24
JW-SG-145-0-1-20240605	24F0117-20	Sediment	06/05/24
JW-SG-1146-0-1-20240605	24F0117-28	Sediment	06/05/24
JW-SG-1146-0-1-20240605MS	24F0117-28MS	Sediment	06/05/24
JW-SG-1146-0-1-20240605MSD	24F0117-28MSD	Sediment	06/05/24

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270E in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The reported result was an estimated quantity value.

U (Non-detected): The analyte was analyzed for, but was not detected above the level of the adjusted detection limit or quantitation limit, as appropriate.

UJ (Non-detected): The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

NJ (Tentatively identified): The analyte has been "tentatively identified" or "presumptively identified" as present, and the associated numerical value was the estimated concentration in the sample.

R (Rejected): The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check was performed at the required frequency.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all analytes.

Average relative response factors (RRF) for all analytes were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all analytes.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all analytes.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample JW-FB-20240605 was identified as a field blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration (ug/L)	Associated Samples
JW-FB-20240605	06/05/24	Trichloroethene	0.016	JW-SG-144-0-1-20240604 JW-SG-146-0-1-20240605 JW-SG-145-0-1-20240605 JW-SG-1146-0-1-20240605

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

Samples JW-SG-146-0-1-20240605 and JW-SG-1146-0-1-20240605 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/Kg)		RPD
	JW-SG-146-0-1-20240605	JW-SG-1146-0-1-20240605	
Naphthalene	49.2	46.9	5
2-Methylnaphthalene	15.6	13.8	12
Acenaphthylene	8.22	7.90	4
Acenaphthene	15.7	8.56	59
2-Nitrophenol	15.7	9.98	45
Phenanthrene	82.3	41.6	66
Anthracene	19.2	13.2	37
Fluoranthene	117	82.6	34
Pyrene	99.4	73.3	30
Benzo(a)anthracene	25.7	25.2	2

Analyte	Concentration (ug/Kg)		RPD
	JW-SG-146-0-1-20240605	JW-SG-1146-0-1-20240605	
Chrysene	36.3	41.7	14
Benzo(b)fluoranthene	28.2	35.6	23
Benzo(k)fluoranthene	13.1	16.2	21
Benzo(j)fluoranthene	11.5	13.5	16
Benzo(a)pyrene	21.9	23.9	9
Indeno(1,2,3-cd)pyrene	10.4	12.5	18
Benzo(g,h,i)perylene	15.8	18.2	14

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Target Analyte Quantitation

Raw data were not reviewed for Stage 2B validation.

XIII. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Jeld-Wen
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 24F0117

No Sample Data Qualified in this SDG

Jeld-Wen
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 24F0117

No Sample Data Qualified in this SDG

Jeld-Wen
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 24F0117

No Sample Data Qualified in this SDG

LDC #: 59625A2b

SDG #: 24F0117

Laboratory: Analytical Resources, Inc., Tukwila, WA

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

Date: 9/10/24

Page: 1 of 1

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW-846 Method 8270E-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	% RSD ≤ 20 ICV ≤ 30
IV.	Continuing calibration	A	CCV ≤ 20
V.	Laboratory Blanks	ND	
VI.	Field blanks	SW	FB = 2
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	SW	D = 3, 5
XI.	Internal standards	A	
XII.	Target analyte quantitation	N	
XIII.	Target analyte identification	N	
XIV	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID		Lab ID	Matrix	Date
1 1	JW-SG-144-0-1-20240604		24F0117-02	Sediment	06/04/24
2 2	JW-FB-20240605	FB	24F0117-07	Water	06/05/24
3	JW-SG-146-0-1-20240605	D	24F0117-19	Sediment	06/05/24
4	JW-SG-145-0-1-20240605		24F0117-20	Sediment	06/05/24
5	JW-SG-1146-0-1-20240605	D	24F0117-28	Sediment	06/05/24
6	JW-SG-1146-0-1-20240605MS		24F0117-28MS	Sediment	06/05/24
7	JW-SG-1146-0-1-20240605MSD		24F0117-28MSD	Sediment	06/05/24
8					
9					
10					

Notes:

1	BMF0259						
2	BMF0230						

TARGET ANALYTE LIST

METHOD: GC/MS SVOC

A. Phenol	GG. Acenaphthene	MMM. Bis(2-Chloroisopropyl)ether	SSSS. 2/3-Dimethyldibenzothiophene	Y1. 3,3'-Dimethylbenzidine
B. Bis (2-chloroethyl) ether	HH. 2,4-Dinitrophenol	NNN. Aniline	TTTT. 1-Methyldibenzothiophene	Z1. o-Toluidine
C. 2-Chlorophenol	II. 4-Nitrophenol	OOO. N-Nitrosodimethylamine	UUUU.. 2,3,4,6-Tetrachlorophenol	A2. Benzo(j)fluoranthene
D. 1,3-Dichlorobenzene	JJ. Dibenzofuran	PPP. Benzoic Acid	VVVV. 1,2,4,5-Tetrachlorobenzene	B2. Benzofluoranthenes, total
E. 1,4-Dichlorobenzene	KK. 2,4-Dinitrotoluene	QQQ. Benzyl alcohol	WWWW.. 2-Picoline	C2. trans-Decalin
F. 1,2-Dichlorobenzene	LL. Diethylphthalate	RRR. Pyridine	XXXX. 3-Methylcholanthrene	D2. cis-Decalin
G. 2-Methylphenol	MM. 4-Chlorophenyl-phenyl ether	SSS. Benzidine	YYYY. a,a-Dimethylphenethylamine	E2. Dibenzo(a)anthracenes
H. 2,2'-Oxybis(1-chloropropane)	NN. Fluorene	TTT. 1-Methylnaphthalene	ZZZZ. Hexachloropropene	F2. Benzo(j)+(k)fluoranthene
I. 4-Methylphenol	OO. 4-Nitroaniline	UUU.Benzo(b)thiophene	A1. N-Nitrosodiethylamine	G2.
J. N-Nitroso-di-n-propylamine	PP. 4,6-Dinitro-2-methylphenol	VVV.Benzonaphthothiophene	B1. N-Nitrosodi-n-butylamine	H2.
K. Hexachloroethane	QQ. N-Nitrosodiphenylamine	WWW.Benzo(e)pyrene	C1. N-Nitrosomethylethylamine	I2.
L. Nitrobenzene	RR. 4-Bromophenyl-phenylether	XXX. 2,6-Dimethylnaphthalene	D1. N-Nitrosomorpholine	J2.
M. Isophorone	SS. Hexachlorobenzene	YYY. 2,3,5-Trimethylnaphthalene	E1. N-Nitrosopyrrolidine	K2.
N. 2-Nitrophenol	TT. Pentachlorophenol	ZZZ. Perylene	F1. Phenacetin	L2.
O. 2,4-Dimethylphenol	UU. Phenanthrene	AAAA. Dibenzothiophene	G1. 2-Acetylaminofluorene	M2.
P. Bis(2-chloroethoxy)methane	VV. Anthracene	BBBB. Benzo(a)fluoranthene	H1. Pronamide	N2.
Q. 2,4-Dichlorophenol	WW. Carbazole	CCCC. Benzo(b)fluorene	I1. Methyl methanesulfonate	O2.
R. 1,2,4-Trichlorobenzene	XX. Di-n-butylphthalate	DDDD. cis/trans-Decalin	J1. Ethyl methanesulfonate	P2.
S. Naphthalene	YY. Fluoranthene	EEEE. Biphenyl	K1. o,o',o''-Triethylphosphorothioate	Q2.
T. 4-Chloroaniline	ZZ. Pyrene	FFFF. Retene	L1. n-Phenylene diamine	R2.
U. Hexachlorobutadiene	AAA. Butylbenzylphthalate	GGGG. C30-Hopane	M1. 1,4-Naphthoquinone	S2.
V. 4-Chloro-3-methylphenol	BBB. 3,3'-Dichlorobenzidine	HHHH. 1-Methylphenanthrene	N1. N-Nitro-o-toluidine	T2.
W. 2-Methylnaphthalene	CCC. Benzo(a)anthracene	IIII. 1,4-Dioxane	O1. 1,3,5-Trinitrobenzene	U2.
X. Hexachlorocyclopentadiene	DDD. Chrysene	JJJJ. Acetophenone	P1. Pentachlorobenzene	V2..
Y. 2,4,6-Trichlorophenol	EEE. Bis(2-ethylhexyl)phthalate	KKKK. Atrazine	Q1. 4-Aminobiphenyl	W2
Z. 2,4,5-Trichlorophenol	FFF. Di-n-octylphthalate	LLLL. Benzaldehyde	R1. 2-Naphthylamine	X2..
AA. 2-Chloronaphthalene	GGG. Benzo(b)fluoranthene	MMMM. Caprolactam	S1. Triphenylene	Y2.
BB. 2-Nitroaniline	HHH. Benzo(k)fluoranthene	NNNN. 2,6-Dichlorophenol	T1. Octachlorostyrene	Z2.
CC. Dimethylphthalate	III. Benzo(a)pyrene	OOOO. 1,2-Diphenylhydrazine	U1. Famphur	
DD. Acenaphthylene	JJJ. Indeno(1,2,3-cd)pyrene	PPPP. 3-Methylphenol	V1. 1,4-phenylenediamine	
EE. 2,6-Dinitrotoluene	KKK. Dibenz(a,h)anthracene	QQQQ. 3&4-Methylphenol	W1. Methapyrilene	
FF. 3-Nitroaniline	LLL. Benzo(g,h,i)perylene	RRRR. 4-Dimethyldibenzothiophene	X1. Pentachloroethane	

LDC #: 59625A2b

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: FT

METHOD: GC/MS BNA (EPA SW 846 Method 8270 E)

(Y) N N/A Were field blanks identified in this SDG?

(Y) N N/A Were target compounds detected in the field blanks?

Blank units: ug/L **Associated sample units:** ug/kg

Sampling date: 06/5/24

Field blank type: (circle one) Field Blank / Rinsate / Other: FB Associated Samples: ~~2~~, 1, 2 ~~3~~ 5 7 5X

Compound	Blank ID	Sample Identification								
	2									
S	0.016									

Blank units: _____ **Associated sample units:** _____

Sampling date: _____

Field blank type: (circle one) Field Blank / Rinsate / Other: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:

Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated field blank concentration were qualified as not detected, "U". Other contaminants within five times the field blank concentration were also qualified as not detected, "U".

LDC#: 59625A2b

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: FT

METHOD: GCMS PAH (EPA SW 846 Method 8270E SIM)

Compound	Concentration (ug/kg)		%RPD
	3	5	
S	49.2	46.9	5
W	15.6	13.8	12
DD	8.22	7.90	4
GG	15.7	8.56	59
N	15.7	9.98	45
UU	82.3	41.6	66
VV	19.2	13.2	37
YY	117	82.6	34
ZZ	99.4	73.3	30
CCC	25.7	25.2	2
DDD	36.3	41.7	14
GGG	28.2	35.6	23
HHH	13.1	16.2	21
A2	11.5	13.5	16
III	21.9	23.9	9
JJJ	10.4	12.5	18
LLL	15.8	18.2	14

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: October 1, 2024

Parameters: Polychlorinated Biphenyls

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 24F0117

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-FB-20240605	24F0117-07	Water	06/05/24
JW-SC-026-0-1-20240605	24F0117-10	Sediment	06/05/24
JW-SC-026-1-2-20240605	24F0117-11	Sediment	06/05/24
JW-SC-024-0-1-20240605	24F0117-12	Sediment	06/05/24
JW-SC-024-1-1.4-20240605	24F0117-13	Sediment	06/05/24
JW-SC-027-0-1-20240605	24F0117-14	Sediment	06/05/24
JW-SC-027-1-2-20240605	24F0117-15	Sediment	06/05/24
JW-SC-1026-0-1-20240605	24F0117-25	Sediment	06/05/24
JW-SC-1026-1-2-20240605	24F0117-26	Sediment	06/05/24
JW-SG-1128-0-1-20240605	24F0117-27	Sediment	06/05/24
JW-SG-1128-0-1-20240605MS	24F0117-27MS	Sediment	06/05/24
JW-SG-1128-0-1-20240605MSD	24F0117-27MSD	Sediment	06/05/24

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The reported result was an estimated quantity value.

U (Non-detected): The analyte was analyzed for, but was not detected above the level of the adjusted detection limit or quantitation limit, as appropriate.

UJ (Non-detected): The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

NJ (Tentatively identified): The analyte has been "tentatively identified" or "presumptively identified" as present, and the associated numerical value was the estimated concentration in the sample.

R (Rejected): The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For analytes where average calibration factors were utilized, the percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the analytes, all coefficients of determination (r^2) were greater than or equal to 0.990.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all analytes.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all analytes with the following exceptions:

Date	Standard	Column	Analyte	%D	Associated Samples	Affected Analyte	Flag	A or P
06/19/24	SMF0272-ICV2	Col 2	Aroclor 1260	53.0	All water samples in SDG 24F0117	Aroclor 1248 Aroclor 1260 Aroclor-1262 Aroclor-1268	NA	-

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample JW-FB-20240605 was identified as a field blank. No contaminants were found.

VI. Surrogates/Internal Standards

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Column	Surrogate	%R (Limits)	Affected Analyte	Flag	A or P
JW-SC-026-0-1-20240605	Col 1 Col 2	Tetrachloro-m-xylene Tetrachloro-m-xylene	48.8 (53-120) 51.4 (53-120)	All analytes	UJ (all non-detects)	P
JW-SC-1026-0-1-20240605	Col 1 Col 2	Decachlorobiphenyl Tetrachloro-m-xylene Decachlorobiphenyl Tetrachloro-m-xylene	33.0 (40-133) 32.8 (53-120) 34.5 (40-133) 35.8 (53-120)	All analytes	J (all detects) UJ (all non-detects)	P

All internal standard areas and retention times were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

Samples JW-SC-026-0-1-20240605 and JW-SC-1026-0-1-20240605 and samples JW-SC-026-1-2-20240605 and JW-SC-1026-1-2-20240605 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/Kg)		RPD
	JW-SC-026-0-1-20240605	JW-SC-1026-0-1-20240605	
Aroclor 1254	19.9U	22.9	Not calculable

X. Target Analyte Quantitation

The sample results for detected analytes from the two columns were within 40% relative percent difference (RPD) with the following exceptions:

Sample	Analyte	RPD	Flag	A or P
JW-SC-024-0-1-20240605	Aroclor 1260	77.5	J (all detects)	A

Sample	Analyte	RPD	Flag	A or P
JW-SC-024-1-1.4-20240605	Aroclor 1248 Aroclor 1260	40.9 49.5	J (all detects) J (all detects)	A

Raw data were not reviewed for Stage 2B validation.

XI. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Data qualified due to surrogate %R and RPD between two columns are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polychlorinated Biphenyls - Data Qualification Summary - SDG 24F0117

Sample	Analyte	Flag	A or P	Reason (Code)
JW-SC-026-0-1-20240605 JW-SC-1026-0-1-20240605	All analytes	J (all detects) UJ (all non-detects)	P	Surrogates (%R) (13)
JW-SC-024-0-1-20240605	Aroclor 1260	J (all detects)	A	Target analyte quantitation (RPD between two columns) (12)
JW-SC-024-1-1.4-20240605	Aroclor 1248 Aroclor 1260	J (all detects) J (all detects)	A	Target analyte quantitation (RPD between two columns) (12)

Jeld-Wen
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG 24F0117

No Sample Data Qualified in this SDG

Jeld-Wen
Polychlorinated Biphenyls - Field Blank Data Qualification Summary - SDG 24F0117

No Sample Data Qualified in this SDG

LDC #: 59625A3b
SDG #: 24F0117
Laboratory: Analytical Resources, Inc., Tukwila, WA

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 9/10/24
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC Polychlorinated Biphenyls (EPA SW-846 Method 8082A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A/A	% RSD ≤ 20, r² ICV ≤ 20
III.	Continuing calibration	SW	CCV ≤ 20
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	FB = 1
VI.	Surrogate spikes 1/5	SW/A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples A	SW	LCS ID *
IX.	Field duplicates	SW	D = 2, 8 3, 9
X.	Target analyte quantitation	SW	
XI.	Target analyte identification	N	
XII.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID		Lab ID	Matrix	Date
1 1	JW-FB-20240605	FB	24F0117-07	Water	06/05/24
2 2	JW-SC-026-0-1-20240605	D	24F0117-10	Sediment	06/05/24
3	JW-SC-026-1-2-20240605	D1	24F0117-11	Sediment	06/05/24
4	JW-SC-024-0-1-20240605		24F0117-12	Sediment	06/05/24
5	JW-SC-024-1-2-20240605		24F0117-13	Sediment	06/05/24
6	JW-SC-027-0-1-20240605		24F0117-14	Sediment	06/05/24
7	JW-SC-027-1-2-20240605		24F0117-15	Sediment	06/05/24
8	JW-SG-1026-0-1-20240605	D	24F0117-25	Sediment	06/05/24
9	JW-SC-1026-1-2-20240605	D1	24F0117-26	Sediment	06/05/24
10	JW-SC-1128-0-1-20240605		24F0117-27	Sediment	06/05/24
11	JW-SG-1146-0-1-20240605MS		24F0117-28MS	Sediment	06/05/24
12	JW-SG-1146-0-1-20240605MSD		24F0117-28MSD	Sediment	06/05/24
13					

Notes:

1	BMF0229						
2	BMF0258						

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG. Chlordane
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH. Chlordane (Technical)
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II. Aroclor 1262
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ. Aroclor 1268
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. 2,4'-DDD	KK. Oxychlordane
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. 2,4'-DDE	LL. trans-Nonachlor
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE. 2,4'-DDT	MM. cis-Nonachlor
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF. Hexachlorobenzene	NN.

Notes:_____

LDC #: 59625 A3b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: FT

METHOD: ___GC ___HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
What type of continuing calibration calculation was performed? ___%D or ___%R
Y N N/A Were continuing calibration standards analyzed at the required frequencies?
Y N N/A Did the continuing calibration standards meet the %D / %R validation criteria of ≤20.0% / 80-120%?
Level IV Only
Y N N/A Were the retention times for all calibrated analytes within their respective acceptance windows?

(5)

#	Date	Standard ID	Detector/ Column	Compound	%D (Limit ≤ 20.0)	RT (limit)	Associated Samples	Qualifications
1	6/19/24	SMF0272-CCV2	col 2	BB	53.0		all water	Jdw/A ND qual Z, BB, II, JJ
2	6/20/24	SMF0247-~~CCH~~CCV6	col 2	BB	FT 24.4 23.3		MB2	Jdw/A ND qual Z, ~~AA~~, BB, FT II, JJ
	note	#1 CCV - a #2	1254 ~~std~~ was	analyzed before it				

LDC #: 59625A36

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

Reviewer: FT

METHOD: ✓ GC __ HPLC

Are surrogates required by the method? Yes___ or No___.

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Were surrogates spiked into all samples and blanks?

Y (N) N/A Did all surrogate recoveries (%R) meet the QC limits?

(13)

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	2	~~NS~~ col 1	Y	48.8 (53-120)	J/UJ/P ND
		col 2	Y	51.4 (↓)	↓
				( )	
	8	col 1	0	33.0 (40-133)	J/UJ/P ND+ Det
		↓	Y	32.8 (53-120)	
		col 2	0	34.5 (↓)	↓
		↓	Y	35.8 (↓)	
				( )	
				( )	
	MBZ	col 1	0	159 (↓)	J/UJ/P all ND
		↓	Y	12.4 (↓)	
		col 2	0	16.8 (↓)	↓
		↓	Y	12.8 (↓)	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	Chloro-octadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-Dichlorophenylacetic acid
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate	CC	2,5-Dibromotoluene
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 59625A3b

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: FT

METHOD: ✓ GC __ HPLC

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target analytes detected in the field duplicate pairs?

Compound	Concentration (ug/kg)		%RPD Limit (≤ ✓ %)	Qualification (Parent only)
	2	8		
AA	19.94	22.9	NC	

Compound	Concentration ( )		%RPD Limit (≤_____%)	Qualification (Parent only)

Compound	Concentration ( )		%RPD Limit (≤_____%))	Qualification (Parent only)

LDC #: 59625A3b

VALIDATION FINDINGS WORKSHEET
Target Analyte Quantitation

Reviewer: FT

METHOD: √GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results? (12)

#	Associated Samples	Compound Name	% RPD Bet 2 col Findings ≤ 40	Qualifications
	4	BB	77.5	Jdet / Δ
	5	Z	40.9	↓
		~~AA~~ FT		
		BB	49.5	↓

Comments: See sample calculation verification worksheet for recalculations Note #5 AA % RPD = 38.5%

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: September 25, 2024

Parameters: Polychlorinated Dioxins/Dibenzofurans

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 24F0117

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-SG-151-0-1-20240604	24F0117-06	Sediment	06/04/24
JW-SG-151-0-1-20240604DL	24F0117-06DL	Sediment	06/04/24
JW-FB-20240605	24F0117-07	Water	06/05/24
JW-RB-20240605	24F0117-08	Water	06/05/24
JW-SG-130-0-1-20240605	24F0117-21	Sediment	06/05/24
JW-SG-128-0-1-20240605	24F0117-22	Sediment	06/05/24
JW-SG-129-0-1-20240605	24F0117-23	Sediment	06/05/24
JW-SG-127-0-1-20240605	24F0117-24	Sediment	06/05/24

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for High Resolution Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Dioxins/Dibenzofurans by Environmental Protection Agency (EPA) Method 1613B

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The reported result was an estimated quantity value.

U (Non-detected): The analyte was analyzed for, but was not detected above the level of the adjusted detection limit or quantitation limit, as appropriate.

UJ (Non-detected): The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

NJ (Tentatively identified): The analyte has been "tentatively identified" or "presumptively identified" as present, and the associated numerical value was the estimated concentration in the sample.

R (Rejected): The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25%.

The static resolving power was at least 10,000 (10% valley definition).

III. Initial Calibration and Initial Calibration Verification

A five point initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all analytes and less than or equal to 35.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were within the QC limits for all analytes and labeled compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration results were within the QC limits for all analytes and labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Analyte	Concentration (pg/L)	Associated Samples
BMF0368	06/17/24	OCDD	5.16	All water samples in SDG 24F0117

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration (pg/L)	Modified Final Concentration (pg/L)
JW-FB-20240605	OCDD	8.63	8.63U
JW-RB-20240605	OCDD	7.09	7.09U

VI. Field Blanks

Sample JW-RB-20240605 was identified as a rinsate blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration (pg/L)	Associated Samples
JW-RB-20240605	06/05/24	1,2,3,4,7,8,9-HpCDF OCDD	2.60 7.09	No associated samples in this SDG

Sample JW-FB-20240605 was identified as a field blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration (pg/L)	Associated Samples
JW-FB-20240605	06/05/24	OCDD	8.63	JW-SG-151-0-1-20240604 JW-SG-151-0-1-20240604DL JW-SG-130-0-1-20240605 JW-SG-128-0-1-20240605 JW-SG-129-0-1-20240605 JW-SG-127-0-1-20240605

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Labeled Compounds

All labeled compound percent recoveries (%R) and ion abundance ratios (IAR) were within QC limits.

XI. Target Analyte Quantitation

All target analyte quantitations met validation criteria with the following exceptions:

Sample	Analyte	Flag	A or P
All samples in SDG 24F0117	All analytes reported by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A

Sample	Analyte	Finding	Criteria	Flag	A or P
JW-SG-151-0-1-20240604	1,2,3,4,6,7,8-HpCDD OCDD	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A

Raw data were not reviewed for Stage 2B validation.

XII. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method.

In the case where more than one result was reported for an individual sample, the least technically acceptable results were deemed not reportable as follows:

Sample	Analyte	Reason	Flag	A or P
JW-SG-151-0-1-20240604	1,2,3,4,6,7,8-HpCDD OCDD	Results exceeded calibration range.	Not reportable	-
JW-SG-151-0-1-20240604DL	All analytes except 1,2,3,4,6,7,8-HpCDD OCDD	Results from undiluted analyses were more usable.	Not reportable	-

Data qualified due to laboratory blank contamination and results reported by the laboratory as EMPCs, are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Data Qualification Summary - SDG 24F0117

Sample	Analyte	Flag	A or P	Reason (Code)
JW-SG-151-0-1-20240604 JW-SG-151-0-1-20240604DL JW-FB-20240605 JW-RB-20240605 JW-SG-130-0-1-20240605 JW-SG-128-0-1-20240605 JW-SG-129-0-1-20240605 JW-SG-127-0-1-20240605	All analytes reported by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A	Target analyte quantitation (EMPC) (23)
JW-SG-151-0-1-20240604	1,2,3,4,6,7,8-HpCDD OCDD	Not reportable	-	Overall assessment of data (22)
JW-SG-151-0-1-20240604DL	All analytes except 1,2,3,4,6,7,8-HpCDD OCDD	Not reportable	-	Overall assessment of data (22)

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG 24F0117

Sample	Analyte	Modified Final Concentration (pg/L)	Code
JW-FB-20240605	OCDD	8.63U	7
JW-RB-20240605	OCDD	7.09U	7

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG 24F0117

No Sample Data Qualified in this SDG

LDC #: 59625A21 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/10/24
SDG #: 24F0117 Stage 2B Page: 1 of 1
Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: HRGC/HRMS Polychlorinated Dioxins/Dibenzofurans (EPA Method 1613B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	% RSD ≤ 20/35 ICV ≤ QC limits
IV.	Continuing calibration	A	CCV = QC limits
V.	Laboratory Blanks	SW	
VI.	Field blanks	SW	FB = 3 RB = 4
VII.	Matrix spike/Matrix spike duplicates	N	CS
VIII.	Laboratory control samples	A	LCS ID
IX.	Field duplicates	N	
X.	Labeled Compounds	A	
XI.	Target analyte quantitation	SW	
XII.	Target analyte identification	N	
XIII	Overall assessment of data	SW	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID		Lab ID	Matrix	Date
1 1	JW-SG-151-0-1-20240604		24F0117-06	Sediment	06/04/24
2 1	JW-SG-151-0-1-20240604DL		24F0117-06DL	Sediment	06/04/24
3 2	JW-FB-20240605	FB	24F0117-07	Water	06/05/24
4 2	JW-RB-20240605	RB	24F0117-08	Water	06/05/24
5	JW-SG-130-0-1-20240605		24F0117-21	Sediment	06/05/24
6	JW-SG-128-0-1-20240605		24F0117-22	Sediment	06/05/24
7	JW-SG-129-0-1-20240605		24F0117-23	Sediment	06/05/24
8	JW-SG-127-0-1-20240605		24F0117-24	Sediment	06/05/24
9					
10					
11					

Notes:

−	1	BMF0487						
+	2	BMF0368						

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans

A. 2,3,7,8-TCDD	F. 1,2,3,4,6,7,8-HpCDD	K. 1,2,3,4,7,8-HxCDF	P. 1,2,3,4,7,8,9-HpCDF	U. Total HpCDD
B. 1,2,3,7,8-PeCDD	G. OCDD	L. 1,2,3,6,7,8-HxCDF	Q. OCDF	V. Total TCDF
C. 1,2,3,4,7,8-HxCDD	H. 2,3,7,8-TCDF	M. 2,3,4,6,7,8-HxCDF	R. Total TCDD	W. Total PeCDF
D. 1,2,3,6,7,8-HxCDD	I. 1,2,3,7,8-PeCDF	N. 1,2,3,7,8,9-HxCDF	S. Total PeCDD	X. Total HxCDF
E. 1,2,3,7,8,9-HxCDD	J. 2,3,4,7,8-PeCDF	O. 1,2,3,4,6,7,8-HpCDF	T. Total HxCDD	Y. Total HpCDF

Notes:_____

LDC #: 59625A21

VALIDATION FINDINGS WORKSHEET
Blanks

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(7)

Y N N/A Were all samples associated with a method blank?

Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?

Y N N/A Was the method blank contaminated?

Blank extraction date: 6/17/24 **Blank analysis date:** 6/18/24 **Associated samples:** all water

Conc. units: pg/L

Compound	Blank ID	Sample Identification								
	MB2	5x		3	4					
G	5.16	25.8		8.63U	7.09U					

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 59625A21

VALIDATION FINDINGS WORKSHEET
Field Blank

Reviewer: [illegible]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were field blank identified in this SDG?

Y N N/A Were target compounds detected in the field blank?

None

Blank unit: pg/L **Associated sample unit:** ng/Kg

Sampling date: 6/5/24 (RB)

Associated samples: ~~1, 2, 5, 7, 8~~ (ND + 7SX)

Compound	Blank ID	Sample Identification								
	4									
P	2.60									
G	7.09									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 59625A21

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: FR

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

(Y) N N/A Were field blanks identified in this SDG?
Blank units: pg/L **Associated sample units:** ng/kg
Sampling date: 6/5/24
Field blank type: (circle one) Field Blank / Rinsate / Other: FB Associated Samples: 1, 2, 5 → 7 8 (7 SX)

Compound	Blank ID	Sample Identification								
	3									
G	8.63									
CRQL										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with compound concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC #: 59625A21

VALIDATION FINDINGS WORKSHEET
Target Analyte Quantitation

Reviewer: A

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N (N/A) Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the compound?
Y N (N/A) Compound quantitation and CRQLs were adjusted to reflect all sample dilutions and dry weight factors (if necessary).

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		All	all analytes qualified as EMPC by the laboratory		J dw /Δ (23)
		#1	F, G - x'd cal	Range	J dw /Δ (20)

Comments: See sample calculation verification worksheet for recalculations

LDC #: 59625A21

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: 1 of 1
Reviewer: FT

METHOD: __ GC __ HPLC 1613B

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

(Y) N N/A Was the overall quality and usability of the data acceptable?

(22)

#	Associated samples	Analytes	Findings	Qualifications
	#1	F, G	x'd cal Range	NR/Δ
	2	all except F, G	diluted	NR/Δ

Comments: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: September 19, 2024

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 24F0161

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-SG-147-0-1-20240606	24F0161-02	Sediment	06/06/24
JW-SG-143-0-1-20240606	24F0161-03	Sediment	06/06/24
JW-SG-142-0-1-20240606	24F0161-05	Sediment	06/06/24
JW-SG-143-0-1-20240606MS	24F0161-03MS	Sediment	06/06/24
JW-SG-143-0-1-20240606MSD	24F0161-03MSD	Sediment	06/06/24

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270E in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The reported result was an estimated quantity value.

U (Non-detected): The analyte was analyzed for, but was not detected above the level of the adjusted detection limit or quantitation limit, as appropriate.

UJ (Non-detected): The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

NJ (Tentatively identified): The analyte has been "tentatively identified" or "presumptively identified" as present, and the associated numerical value was the estimated concentration in the sample.

R (Rejected): The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance check was performed at the required frequency.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For analytes where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the analytes, all coefficients of determination (r^2) were greater than or equal to 0.990.

Average relative response factors (RRF) for all analytes were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all analytes.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all analytes.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Target Analyte Quantitation

Raw data were not reviewed for Stage 2B validation.

XIII. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Jeld-Wen
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 24F0161

No Sample Data Qualified in this SDG

Jeld-Wen
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 24F0161

No Sample Data Qualified in this SDG

Jeld-Wen
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 24F0161

No Sample Data Qualified in this SDG

LDC #: 59625B2b

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

Date: 9/10/24

SDG #: 24F0161

Page: 1 of 1

Laboratory: Analytical Resources, Inc., Tukwila, WA

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW-846 Method 8270E-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/Δ	
II.	GC/MS Instrument performance check	Δ	
III.	Initial calibration/ICV	A/Δ	%RSD ≤ 20, r² ICV ≤ 30
IV.	Continuing calibration	Δ	CCV ≤ 20
V.	Laboratory Blanks	Δ	
VI.	Field blanks	N	
VII.	Surrogate spikes	Δ	
VIII.	Matrix spike/Matrix spike duplicates	Δ	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	N	
XI.	Internal standards	Δ	
XII.	Target analyte quantitation	N	
XIII.	Target analyte identification	N	
XIV	Overall assessment of data	Δ	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	JW-SG-147-0-1-20240606	24F0161-02	Sediment	06/06/24
2	JW-SG-143-0-1-20240606	24F0161-03	Sediment	06/06/24
3	JW-SG-142-0-1-20240606	24F0161-05	Sediment	06/06/24
4	JW-SG-143-0-1-20240606MS	24F0161-03MS	Sediment	06/06/24
5	JW-SG-143-0-1-20240606MSD	24F0161-03MSD	Sediment	06/06/24
6				
7				
8				
9				
10				

Notes:

	BMF0358						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: September 25, 2024

Parameters: Polychlorinated Dioxins/Dibenzofurans

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 24F0161

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-SG-126-0-1-20240606	24F0161-01	Sediment	06/06/24
JW-SC-028-0-1-20240606	24F0161-08	Sediment	06/06/24
JW-SC-028-1-2-20240606	24F0161-09	Sediment	06/06/24
JW-SC-030-0-1-20240606	24F0161-10	Sediment	06/06/24

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A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

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1 Holding Times
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8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25%.

The static resolving power was at least 10,000 (10% valley definition).

III. Initial Calibration and Initial Calibration Verification

A five point initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all analytes and less than or equal to 35.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were within the QC limits for all analytes and labeled compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration results were within the QC limits for all analytes and labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample JW-RB-20240722 (from SDG 24G0502/10702950) was identified as a rinsate blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration (pg/L)	Associated Samples
JW-RB-20240722	07/22/24	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD Total HxCDD 1,2,3,4,6,7,8-HpCDD Total HpCDD OCDF OCDD	0.62 2.2 2.2 2.3 2.2 1.9 7.5	JW-SC-030-0-1-20240606

Sample JW-FB-20240605 (from SDG 24F0117) was identified as a field blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration (pg/L)	Associated Samples
JW-FB-20240605	06/05/24	OCDD	8.63	All samples in SDG 24F0161

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Labeled Compounds

All labeled compound percent recoveries (%R) and ion abundance ratios (IAR) were within QC limits.

XI. Target Analyte Quantitation

All target analyte quantitations met validation criteria with the following exceptions:

Sample	Analyte	Flag	A or P
All samples in SDG 24F0161	All analytes reported by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A

Raw data were not reviewed for Stage 2B validation.

XII. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Data qualified due to results reported by the laboratory as EMPCs, are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Data Qualification Summary - SDG 24F0161

Sample	Analyte	Flag	A or P	Reason (Code)
JW-SG-126-0-1-20240606 JW-SC-028-0-1-20240606 JW-SC-028-1-2-20240606 JW-SC-030-0-1-20240606	All analytes reported by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A	Target analyte quantitation (EMPC) (23)

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG 24F0161

No Sample Data Qualified in this SDG

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG 24F0161

No Sample Data Qualified in this SDG

LDC #: 59625B21 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/10/24

SDG #: 24F0161 Stage 2B Page: 1 of 1

Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: HRGC/HRMS Polychlorinated Dioxins/Dibenzofurans (EPA Method 1613B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	%D RSD ≤ 20/35 ICV = QC limits
IV.	Continuing calibration	A	CCV = QC limits
V.	Laboratory Blanks	A	
VI.	Field blanks	SW	RB = JW-RB-20240722 (24G0502 / 1070295D)
VII.	Matrix spike/Matrix spike duplicates	N	MS FB = JW-FB-20240605
VIII.	Laboratory control samples	A	LCS (24F0117)
IX.	Field duplicates	N	
X.	Labeled Compounds	A	
XI.	Target analyte quantitation	SW	
XII.	Target analyte identification	N	
XIII.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	JW-SG-126-0-1-20240606	24F0161-01	Sediment	06/06/24
2	JW-SC-028-0-1-20240606	24F0161-08	Sediment	06/06/24
3	JW-SC-028-1-2-20240606	24F0161-09	Sediment	06/06/24
4	JW-SC-030-0-1-20240606	24F0161-10	Sediment	06/06/24
5				
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11				

Notes:

-	BMF0487						

LDC #: 59625B21

VALIDATION FINDINGS WORKSHEET
Field Blank

Reviewer: F7

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were field blank identified in this SDG?

Y N N/A Were target compounds detected in the field blank?

Blank unit: pg/L **Associated sample unit:** ng/kg

Sampling date: 7/22/24 RB **Associated samples:** 4 7 5X

Compound	Blank ID	Sample Identification								
	JW-RB-20240722									
N	0.62									
C	2.2									
T	2.2									
F	2.3									
U	2.2									
Q	19									
G	7.5									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 59625B21

VALIDATION FINDINGS WORKSHEET
Field Blank

Reviewer: FT

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were field blank identified in this SDG?

Y N N/A Were target compounds detected in the field blank?

Blank unit: pg/L **Associated sample unit:** ng/kg

Sampling date: 6/5/24 FB **Associated samples:** All (7 5X)

Compound	Blank ID	Sample Identification								
	JW-FB-20240605									
G	8.63									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 59625 B21

VALIDATION FINDINGS WORKSHEET
Target Analyte Quantitation

Reviewer: RJ

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the compound?
Y N N/A Compound quantitation and CRQLs were adjusted to reflect all sample dilutions and dry weight factors (if necessary).

23

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		All	all analytes qualified as EMPC		J dnr / Δ

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: September 19, 2024

Parameters: Polychlorinated Biphenyls

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 24G0480

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-RB-20240719	24G0480-41	Water	07/19/24
JW-RB-20240719MS	24G0480-41MS	Water	07/19/24
JW-RB-20240719MSD	24G0480-41MSD	Water	07/19/24

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The reported result was an estimated quantity value.

U (Non-detected): The analyte was analyzed for, but was not detected above the level of the adjusted detection limit or quantitation limit, as appropriate.

UJ (Non-detected): The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

NJ (Tentatively identified): The analyte has been "tentatively identified" or "presumptively identified" as present, and the associated numerical value was the estimated concentration in the sample.

R (Rejected): The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all analytes.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all analytes.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all analytes.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample JW-RB-20240719 was identified as a rinsate blank. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Target Analyte Quantitation

Raw data were not reviewed for Stage 2B validation.

XI. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Jeld-Wen
Polychlorinated Biphenyls - Data Qualification Summary - SDG 24G0480

No Sample Data Qualified in this SDG

Jeld-Wen
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG 24G0480

No Sample Data Qualified in this SDG

Jeld-Wen
Polychlorinated Biphenyls - Field Blank Data Qualification Summary - SDG 24G0480

No Sample Data Qualified in this SDG

LDC #: 59625C3b
SDG #: 24G0480
Laboratory: Analytical Resources, Inc., Tukwila, WA

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 9/10/24
Page: 1 of 1
Reviewer: PR
2nd Reviewer: RC

METHOD: GC Polychlorinated Biphenyls (EPA SW-846 Method 8082A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	%RSD ≤ 20 ICV ≤ 20
III.	Continuing calibration	A	CCV ≤ 20
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	RB = 1
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	QC sample
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Target analyte quantitation	N	
XI.	Target analyte identification	N	
XII.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	JW-RB-20240719 RB	24G0480-41	Water	07/19/24
2	JW-RB-20240719MS	24G0480-41MS	Water	07/19/24
3	JW-RB-20240719MSD	24G0480-41MSD	Water	07/19/24
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Notes:

	BM 60552						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: October 1, 2024

Parameters: Polychlorinated Dioxins/Dibenzofurans

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA/
Pace Analytical Services, LLC, Minneapolis, MN

Sample Delivery Group (SDG): 24G0480/10702949

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-SC-005-0-1-20240718	24G0480-01/10702949001	Sediment	07/18/24
JW-SC-005-3-4-20240718	24G0480-04/10702949002	Sediment	07/18/24
JW-SC-003-0-1-20240718	24G0480-05/10702949003	Sediment	07/18/24
JW-SC-003-3-4-20240718	24G0480-08/10702949004	Sediment	07/18/24
JW-SC-002-0-1-20240718	24G0480-11/10702949005	Sediment	07/18/24
JW-SC-002-3-4-20240718	24G0480-14/10702949006	Sediment	07/18/24
JW-SC-001-0-1-20240718	24G0480-17/10702949007	Sediment	07/18/24
JW-SC-001-3-4-20240718	24G0480-20/10702949008	Sediment	07/18/24
JW-SC-020-0-1-20240719	24G0480-23/10702949009	Sediment	07/19/24
JW-SC-020-3-4-20240719	24G0480-26/10702949010	Sediment	07/19/24
JW-SC-012-0-1-20240719	24G0480-29/10702949011	Sediment	07/19/24
JW-SC-012-3-4-20240719	24G0480-32/10702949012	Sediment	07/19/24
JW-SC-018-0-1-20240719	24G0480-35/10702949013	Sediment	07/19/24
JW-SC-018-3-4-20240719	24G0480-38/10702949014	Sediment	07/19/24
JW-RB-20240719	24G0480-41/10702949015	Water	07/19/24
JW-SC-007-0-1-20240719	24G0480-42/10702949016	Sediment	07/19/24
JW-SC-007-3-4-20240719	24G0480-45/10702949017	Sediment	07/19/24
JW-SC-1007-0-1-20240719	24G0480-48/10702949018	Sediment	07/19/24
JW-SC-1007-3-4-20240719	24G0480-49/10702949019	Sediment	07/19/24
JW-SC-009-0-1-20240719	24G0480-50/10702949020	Sediment	07/19/24
JW-SC-009-3-4-20240719	24G0480-53/10702949021	Sediment	07/19/24
JW-SC-018-3-4-20240719MS	24G0480-38MS/10702949014MS	Sediment	07/19/24
JW-SC-018-3-4-20240719MSD	24G0480-38MSD/10702949014MSD	Sediment	07/19/24
JW-SC-009-0-1-20240719DUP	24G0480-50DUP/10702949020DUP	Sediment	07/19/24

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for High Resolution Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Dioxins/Dibenzofurans by Environmental Protection Agency (EPA) Method 1613B

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The reported result was an estimated quantity value.

U (Non-detected): The analyte was analyzed for, but was not detected above the level of the adjusted detection limit or quantitation limit, as appropriate.

UJ (Non-detected): The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

NJ (Tentatively identified): The analyte has been "tentatively identified" or "presumptively identified" as present, and the associated numerical value was the estimated concentration in the sample.

R (Rejected): The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25%.

The static resolving power was at least 10,000 (10% valley definition).

III. Initial Calibration and Initial Calibration Verification

A five point initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all analytes and less than or equal to 35.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were within the QC limits for all analytes and labeled compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration results were within the QC limits for all analytes and labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Analyte	Concentration	Associated Samples
Blank 114177	08/08/24	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD Total HxCDD 1,2,3,4,6,7,8-HpCDD OCDD	0.047 ng/Kg 0.094 ng/Kg 0.094 ng/Kg 0.091 ng/Kg 0.27 ng/Kg	JW-SC-018-0-1-20240719 JW-SC-018-3-4-20240719 JW-SC-007-0-1-20240719 JW-SC-007-3-4-20240719 JW-SC-1007-0-1-20240719 JW-SC-1007-3-4-20240719 JW-SC-009-0-1-20240719 JW-SC-009-3-4-20240719
Blank 114298	08/15/24	1,2,3,7,8-PeCDF 1,2,3,4,7,8-HxCDD Total HxCDD OCDD	0.78 pg/L 2.0 pg/L 2.0 pg/L 7.7 pg/L	JW-RB-20240719
Blank 114175	08/08/24	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD 1,2,3,4,6,7,8-HpCDD Total HpCDD OCDD	0.063 ng/Kg 0.083 ng/Kg 0.049 ng/Kg 0.11 ng/Kg 0.32 ng/Kg	JW-SC-005-0-1-20240718 JW-SC-005-3-4-20240718 JW-SC-003-0-1-20240718 JW-SC-003-3-4-20240718 JW-SC-002-0-1-20240718 JW-SC-002-3-4-20240718 JW-SC-001-0-1-20240718 JW-SC-001-3-4-20240718 JW-SC-020-0-1-20240719 JW-SC-020-3-4-20240719 JW-SC-012-0-1-20240719 JW-SC-012-3-4-20240719

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
JW-SC-018-0-1-20240719	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD	0.11 ng/Kg 0.26 ng/Kg	0.11U ng/Kg 0.26U ng/Kg
JW-SC-018-3-4-20240719	Total HxCDD	0.46 ng/Kg	0.46J ng/Kg
JW-SC-007-3-4-20240719	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD	0.14 ng/Kg 0.30 ng/Kg	0.14U ng/Kg 0.30U ng/Kg
JW-SC-1007-3-4-20240719	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD	0.18 ng/Kg 0.40 ng/Kg	0.18U ng/Kg 0.40U ng/Kg
JW-SC-009-3-4-20240719	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD	0.20 ng/Kg 0.19 ng/Kg	0.20U ng/Kg 0.19U ng/Kg
JW-RB-20240719	1,2,3,7,8-PeCDF 1,2,3,4,7,8-HxCDD Total HxCDD OCDD	1.6 pg/L 6.0 pg/L 6.0 pg/L 11 pg/L	1.6U pg/L 6.0U pg/L 6.0J pg/L 11U pg/L

Sample	Analyte	Reported Concentration	Modified Final Concentration
JW-SC-005-0-1-20240718	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD	0.13 ng/Kg 0.40 ng/Kg	0.13U ng/Kg 0.40U ng/Kg
JW-SC-005-3-4-20240718	1,2,3,4,7,8-HxCDD	0.10 ng/Kg	0.10U ng/Kg
JW-SC-003-0-1-20240718	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD	0.13 ng/Kg 0.34 ng/Kg	0.13U ng/Kg 0.34U ng/Kg
JW-SC-003-3-4-20240718	1,2,3,7,8,9-HxCDF	0.22 ng/Kg	0.22U ng/Kg
JW-SC-002-0-1-20240718	1,2,3,4,7,8-HxCDD	0.20 ng/Kg	0.20U ng/Kg
JW-SC-002-3-4-20240718	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD	0.17 ng/Kg 0.35 ng/Kg	0.17U ng/Kg 0.35U ng/Kg
JW-SC-001-0-1-20240718	1,2,3,4,7,8-HxCDD	0.20 ng/Kg	0.20U ng/Kg
JW-SC-001-3-4-20240718	1,2,3,7,8,9-HxCDF	0.39 ng/Kg	0.39U ng/Kg
JW-SC-020-3-4-20240719	1,2,3,4,7,8-HxCDD 1,2,3,4,6,7,8-HpCDD Total HpCDD OCDD	0.079 ng/Kg 0.12 ng/Kg 0.25 ng/Kg 1.6 ng/Kg	0.079U ng/Kg 0.12U ng/Kg 0.25J ng/Kg 1.6U ng/Kg
JW-SC-012-0-1-20240719	1,2,3,7,8,9-HxCDF	0.098 ng/Kg	0.098U ng/Kg
JW-SC-012-3-4-20240719	1,2,3,4,7,8-HxCDD	0.13 ng/Kg	0.13U ng/Kg

VI. Field Blanks

Sample JW-RB-20240719 was identified as a rinsate blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration (pg/L)	Associated Samples
JW-RB-20240719	07/19/24	1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,7,8-PeCDD 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF Total HxCDF 1,2,3,4,7,8-HxCDD 1,2,3,7,8,9-HxCDD Total HxCDD OCDD	1.6 1.4 1.3 1.4 1.5 2.6 4.1 6.0 1.8 6.0 11	JW-SC-020-0-1-20240719 JW-SC-020-3-4-20240719 JW-SC-012-0-1-20240719 JW-SC-012-3-4-20240719 JW-SC-018-0-1-20240719 JW-SC-018-3-4-20240719 JW-SC-007-0-1-20240719 JW-SC-007-3-4-20240719 JW-SC-1007-0-1-20240719 JW-SC-1007-3-4-20240719 JW-SC-009-0-1-20240719 JW-SC-009-3-4-20240719

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks.

VII. Matrix Spike/Matrix Spike Duplicates/Laboratory Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

Laboratory duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (≤35)	Flag	A or P
JW-SC-009-0-1-20240719DUP (JW-SC-009-0-1-20240719)	Total HxCDF Total HpCDD	80 36	J (all detects) J (all detects)	A

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

Samples JW-SC-007-0-1-20240719 and JW-SC-1007-0-1-20240719 and samples JW-SC-007-3-4-20240719 and JW-SC-1007-3-4-20240719 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/Kg)		RPD
	JW-SC-007-0-1-20240719	JW-SC-1007-0-1-20240719	
2,3,7,8-TCDF	0.16	0.36	77
Total TCDF	0.60	4.4	152
Total TCDD	0.64	1.8	95
1,2,3,7,8-PeCDF	0.16	0.36	77
2,3,4,7,8-PeCDF	0.33	0.96	98
Total PeCDF	7.1	20	95
1,2,3,7,8-PeCDD	0.17	0.60	112
Total PeCDD	1.4	6.3	127
1,2,3,4,7,8-HxCDF	2.3	3.1	30
1,2,3,6,7,8-HxCDF	0.60	1.7	96
2,3,4,6,7,8-HxCDF	1.6	3.9	84
1,2,3,7,8,9-HxCDF	0.44	0.95	73
Total HxCDF	49	110	77

Analyte	Concentration (ng/Kg)		RPD
	JW-SC-007-0-1-20240719	JW-SC-1007-0-1-20240719	
1,2,3,4,7,8-HxCDD	0.064U	1.2	NC
1,2,3,6,7,8-HxCDD	21	62	99
1,2,3,7,8,9-HxCDD	6.4	19	99
Total HxCDD	160	470	98
1,2,3,4,6,7,8-HpCDF	48	110	78
1,2,3,4,7,8,9-HpCDF	1.3	3.1	82
Total HpCDF	130	260	67
1,2,3,4,6,7,8-HpCDD	230	700	101
Total HpCDD	530	1600	100
1,2,3,4,6,7,8-HpCDF	49	130	91
OCDD	770	2500	106

Analyte	Concentration (ng/Kg)		RPD
	JW-SC-007-3-4-20240719	JW-SC-1007-3-4-20240719	
2,3,7,8-TCDF	1.3	1.5	14
Total TCDF	9.1	12	27
2,3,7,8-TCDD	0.096	0.092	4
Total TCDD	6.2	6.7	8
1,2,3,7,8-PeCDF	0.22	0.26	17
2,3,4,7,8-PeCDF	0.35	0.44	23
Total PeCDF	5.3	6.5	20
1,2,3,7,8-PeCDD	0.16	0.20	22
Total PeCDD	5.4	5.0	8
1,2,3,4,7,8-HxCDF	0.60	0.70	15
1,2,3,6,7,8-HxCDF	0.31	0.43	32
2,3,4,6,7,8-HxCDF	0.42	0.51	19
1,2,3,7,8,9-HxCDF	0.14	0.18	25
Total HxCDF	9.4	10	6
1,2,3,4,7,8-HxCDD	0.30	0.40	29
1,2,3,6,7,8-HxCDD	2.8	1.7	49
1,2,3,7,8,9-HxCDD	1.1	0.80	32
Total HxCDD	25	17	38
1,2,3,4,6,7,8-HpCDF	6.9	7.8	12
1,2,3,4,7,8,9-HpCDF	0.40	0.45	12
Total HpCDF	21	24	13
1,2,3,4,6,7,8-HpCDD	37	34	8
Total HpCDD	83	75	10
1,2,3,4,6,7,8-HpCDF	16	20	22
OCDD	260	320	21

X. Labeled Compounds

All labeled compound percent recoveries (%R) and ion abundance ratios (IAR) were within QC limits.

XI. Target Analyte Quantitation

All target analyte quantitations met validation criteria with the following exceptions:

Sample	Analyte	Flag	A or P
All samples in SDG 24G0480/10702949	All analytes flagged "I" by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A

Sample	Analyte	Finding	Flag	A or P
JW-SC-005-0-1-20240718 JW-SC-003-0-1-20240718 JW-SC-003-3-4-20240718 JW-SC-002-0-1-20240718	1,2,3,6,7,8-HxCDF	All analytes flagged "P" by the laboratory due to polychlorinated diphenyl ether (PCDPE) interference.	J (all detects)	A
JW-SC-007-0-1-20240719 JW-SC-1007-3-4-20240719 JW-SC-009-3-4-20240719	1,2,3,4,7,8-HxCDF	All analytes flagged "P" by the laboratory due to polychlorinated diphenyl ether (PCDPE) interference.	J (all detects)	A

Raw data were not reviewed for Stage 2B validation.

XII. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Data qualified due to laboratory blank contamination, DUP RPD, results reported by the laboratory as EMPCs, and PCDPE interference, are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Data Qualification Summary - SDG 24G0480/10702949

Sample	Analyte	Flag	A or P	Reason (Code)
JW-SC-009-0-1-20240719	Total HxCDF Total HpCDD	J (all detects) J (all detects)	A	Laboratory duplicates (RPD) (9)
JW-SC-005-0-1-20240718 JW-SC-005-3-4-20240718 JW-SC-003-0-1-20240718 JW-SC-003-3-4-20240718 JW-SC-002-0-1-20240718 JW-SC-002-3-4-20240718 JW-SC-001-0-1-20240718 JW-SC-001-3-4-20240718 JW-SC-020-0-1-20240719 JW-SC-020-3-4-20240719 JW-SC-012-0-1-20240719 JW-SC-012-3-4-20240719 JW-SC-018-0-1-20240719 JW-SC-018-3-4-20240719 JW-RB-20240719 JW-SC-007-0-1-20240719 JW-SC-007-3-4-20240719 JW-SC-1007-0-1-20240719 JW-SC-1007-3-4-20240719 JW-SC-009-0-1-20240719 JW-SC-009-3-4-20240719	All analytes flagged "I" by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A	Target analyte quantitation (EMPC) (23)
JW-SC-005-0-1-20240718 JW-SC-003-0-1-20240718 JW-SC-003-3-4-20240718 JW-SC-002-0-1-20240718	1,2,3,6,7,8-HxCDF	J (all detects)	A	Target analyte quantitation (PCDPE) (24)
JW-SC-007-0-1-20240719 JW-SC-1007-3-4-20240719 JW-SC-009-3-4-20240719	1,2,3,4,7,8-HxCDF	J (all detects)	A	Target analyte quantitation (PCDPE) (24)

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG 24G0480/10702949

Sample	Analyte	Modified Final Concentration	Code
JW-SC-018-0-1-20240719	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD	0.11U ng/Kg 0.26U ng/Kg	7
JW-SC-018-3-4-20240719	Total HxCDD	0.46J ng/Kg	7
JW-SC-007-3-4-20240719	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD	0.14U ng/Kg 0.30U ng/Kg	7

Sample	Analyte	Modified Final Concentration	Code
JW-SC-1007-3-4-20240719	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD	0.18U ng/Kg 0.40U ng/Kg	7
JW-SC-009-3-4-20240719	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD	0.20U ng/Kg 0.19U ng/Kg	7
JW-RB-20240719	1,2,3,7,8-PeCDF 1,2,3,4,7,8-HxCDD Total HxCDD OCDD	1.6U pg/L 6.0U pg/L 6.0J pg/L 11U pg/L	7
JW-SC-005-0-1-20240718	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD	0.13U ng/Kg 0.40U ng/Kg	7
JW-SC-005-3-4-20240718	1,2,3,4,7,8-HxCDD	0.10U ng/Kg	7
JW-SC-003-0-1-20240718	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD	0.13U ng/Kg 0.34U ng/Kg	7
JW-SC-003-3-4-20240718	1,2,3,7,8,9-HxCDF	0.22U ng/Kg	7
JW-SC-002-0-1-20240718	1,2,3,4,7,8-HxCDD	0.20U ng/Kg	7
JW-SC-002-3-4-20240718	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD	0.17U ng/Kg 0.35U ng/Kg	7
JW-SC-001-0-1-20240718	1,2,3,4,7,8-HxCDD	0.20U ng/Kg	7
JW-SC-001-3-4-20240718	1,2,3,7,8,9-HxCDF	0.39U ng/Kg	7
JW-SC-020-3-4-20240719	1,2,3,4,7,8-HxCDD 1,2,3,4,6,7,8-HpCDD Total HpCDD OCDD	0.079U ng/Kg 0.12U ng/Kg 0.25J ng/Kg 1.6U ng/Kg	7
JW-SC-012-0-1-20240719	1,2,3,7,8,9-HxCDF	0.098U ng/Kg	7
JW-SC-012-3-4-20240719	1,2,3,4,7,8-HxCDD	0.13U ng/Kg	7

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG 24G0480/10702949

No Sample Data Qualified in this SDG

LDC #: 59625C21 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/11/24
SDG #: 24G0480/10702949 Stage 2B Page: 1 of 2
Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer:
Sub-Laboratory: Pace Analytical Services, LLC, Minneapolis, MN 2nd Reviewer:
METHOD: HRGC/HRMS Polychlorinated Dioxins/Dibenzofurans (EPA Method 1613B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration/ICV	A A	%RSD ≤20/35 ICV = QC limits
IV.	Continuing calibration	A	CCV = QC limits
V.	Laboratory Blanks	SW	
VI.	Field blanks	SW	RB = 15
VII.	Matrix spike/Matrix spike duplicates /DUP	A/SW	
VIII.	Laboratory control samples	A	LCS ID
IX.	Field duplicates	SW	D = 16, 18 17, 19
X.	Labeled Compounds	A	
XI.	Target analyte quantitation	SW	
XII.	Target analyte identification	N	
XIII	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID		Lab ID	Matrix	Date
1 r	JW-SC-005-0-1-20240718	10702949001	24G0480-01	Sediment	07/18/24
2 r	JW-SC-005-3-4-20240718	002	24G0480-04	Sediment	07/18/24
3 r	JW-SC-003-0-1-20240718	003	24G0480-05	Sediment	07/18/24
4 r	JW-SC-003-3-4-20240718	004	24G0480-08	Sediment	07/18/24
5 r	JW-SC-002-0-1-20240718	005	24G0480-11	Sediment	07/18/24
6 r	JW-SC-002-3-4-20240718	006	24G0480-14	Sediment	07/18/24
7 r	JW-SC-001-0-1-20240718	007	24G0480-17	Sediment	07/18/24
8 r	JW-SC-001-3-4-20240718	008	24G0480-20	Sediment	07/18/24
9 r	JW-SC-020-0-1-20240718	009	24G0480-23	Sediment	07/19/24
10 r	JW-SC-020-3-4-20240719	010	24G0480-26	Sediment	07/19/24
11 r	JW-SC-012-0-1-20240719	011	24G0480-29	Sediment	07/19/24
12 r	JW-SC-012-3-4-20240719	012	24G0480-32	Sediment	07/19/24
13 1	JW-SC-018-0-1-20240719	013	24G0480-35	Sediment	07/19/24
14 1	JW-SC-018-3-4-20240719	014	24G0480-38	Sediment	07/19/24
15 4	JW-RB-20240719	RB 015	24G0480-41	Water	07/19/24
16 1	JW-SC-007-0-1-20240719	D 016	24G0480-42	Sediment	07/19/24

LDC #: 59625C21 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/11/24

SDG #: 24G0480/10702949 Stage 2B Page: 1 of 2

Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer:

Sub-Laboratory: Pace Analytical Services, LLC, Minneapolis, MN 2nd Reviewer:

METHOD: HRGC/HRMS Polychlorinated Dioxins/Dibenzofurans (EPA Method 1613B)

	Client ID		Lab ID	Matrix	Date
17 1	JW-SC-007-3-4-20240719	D1 10702949017	24G0480-45	Sediment	07/19/24
18 1	JW-SC-1007-0-1-20240719	D 018	24G0480-48	Sediment	07/19/24
19 1	JW-SC-1007-3-4-20240719	D1 019	24G0480-49	Sediment	07/19/24
20 1	JW-SC-009-0-1-20240719	020	24G0480-50	Sediment	07/19/24
21 1	JW-SC-009-3-4-20240719	021	24G0480-53	Sediment	07/19/24
22 1	JW-SC-018-3-4-20240719MS	014MS	24G0480-38MS	Sediment	07/19/24
23 1	JW-SC-018-3-4-20240719MSD	014MSD	24G0480-38MSD	Sediment	07/19/24
24 3	JW-SC-009-0-1-20240719DUP	020DUP	24G0480-50DUP	Sediment	07/19/24
25					
26					
27					

Notes:

1	Blank 114177	MB1				
2	114175	MB2				
3	114185	MB3				
4	114298	MB4				

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans

A. 2,3,7,8-TCDD	F. 1,2,3,4,6,7,8-HpCDD	K. 1,2,3,4,7,8-HxCDF	P. 1,2,3,4,7,8,9-HpCDF	U. Total HpCDD
B. 1,2,3,7,8-PeCDD	G. OCDD	L. 1,2,3,6,7,8-HxCDF	Q. OCDF	V. Total TCDF
C. 1,2,3,4,7,8-HxCDD	H. 2,3,7,8-TCDF	M. 2,3,4,6,7,8-HxCDF	R. Total TCDD	W. Total PeCDF
D. 1,2,3,6,7,8-HxCDD	I. 1,2,3,7,8-PeCDF	N. 1,2,3,7,8,9-HxCDF	S. Total PeCDD	X. Total HxCDF
E. 1,2,3,7,8,9-HxCDD	J. 2,3,4,7,8-PeCDF	O. 1,2,3,4,6,7,8-HpCDF	T. Total HxCDD	Y. Total HpCDF

Notes:_____

LDC #: 25 59664B21

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: PT

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

(7)

Blank extraction date: 8/8/24 Analyzed: 8/12/24
Conc. units: ng/kg Associated Samples: 13, 14, 16-21

Compound	Blank ID	Sample Identification								
	MB1	5X	13	14	17	19	21			
N	0.047	0.235	0.114	-	0.141	0.184	0.204			
C	0.094	0.47	0.264	-	0.304	0.404	0.194			
T	0.094	0.47	-	0.46J	.	-	-			
F	0.091	0.455	-	-	-	-	-			
G	0.27	1.35	-	-	-	-	-			

Blank extraction date: 8/15/24 Analyzed: 8/17/24
Conc. units: ng/kg Associated Samples: 15

Compound	Blank ID	Sample Identification								
	MB4	5X		15						
I	0.78	3.9		1.64						
C	2.0	10.0		6.04						
T	2.0	10.0		6.0J						
G	7.7	38.5		114						

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 25 59604B21

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: RT

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a method blank?

Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed? (7)

Y N N/A Was the method blank contaminated?

Blank extraction date: 8/9/24 **Blank analysis date:** 8/14/24

Conc. units: ng/kg **Associated samples:** 22 7 5X

Compound	Blank ID	Sample Identification								
	MB3		22							
N	0.049									
X	0.049									
C	0.083									
T	0.050									
F	0.047									
G	0.37									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 59625 04B21

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: FM

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

(7)

Blank extraction date: 8/8/24 Analyzed: 8/13/24
Conc. units: ng/Kg Associated Samples: 1 → 12

Compound	Blank ID	Sample Identification								
	MB2	SX	1	2	3	4	5	6	7	8
N	0.063	0.315	0.13J	-	0.13J	0.22J		0.17J		0.39J
C	0.083	0.415	0.40J	0.10J	0.34J	-	0.20J	0.35J	0.20J	
F	0.049	0.245								
U	0.11	0.55								
G	0.32	1.6								

Blank extraction date: ↓
Conc. units: Associated Samples: 1 → 12

Compound	Blank ID	Sample Identification								
	MB2	SX	~~9~~ 10	11	12					
N	0.063	0.315	-	0.098J						
C	0.083	0.415	0.079J	-	0.13J					
F	0.049	0.245	0.12J							
U	0.11	0.55	0.25J							
G	0.32	1.6	1.6J							

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 59625C21

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: KP

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Y N N/A Were field blanks identified in this SDG?
Blank units: pg/L **Associated sample units:** ng/kg
Sampling date: 7/19/24
Field blank type: (circle one) Field Blank / Rinsate / Other: RB Associated Samples: 9 - 14, 16 - 21 (ND & 75X)

Compound	Blank ID	Sample Identification								
	15									
I	1.6									
J	1.4									
B	1.3									
L	1.4									
M	1.5									
N	2.6									
X	4.1									
C	6.0									
E	F1 ~~6.2~~ 1.8									
T	6.0									
G	11									
CRQL										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with compound concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC #: 59625C21

VALIDATION FINDINGS WORKSHEET
Lab Duplicate Analysis

Reviewer: FT

METHOD: 1613B

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 35% ?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

(9)

#	Duplicate ID	Matrix	Compound	RPD (Limits ≤ 35%)	Associated Samples	Qualifications
	20 + 24	sediment	x	80	20	J (all) / A
			4	36	↓	↓

Comments: _____

LDC #: 59626C21

VALIDATION FINDINGS WORKSHEET
Target Analyte Quantitation

Page: 1 of 1
Reviewer: KF

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the compound?
Y N N/A Compound quantitation and CRQLs were adjusted to reflect all sample dilutions and dry weight factors (if necessary).

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		All	All analytes qualified as EMPC by the laboratory	I	Jdtī/A (23)
		1, 3, 4, 5	analyte qualified P by the laboratory for PCDE interference		Jdtī/A qual L (24)
		16, 19, 21	↓		Jdtī/A qual K (24)

LDC#: 59625C21

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:__FT____

METHOD: 1613B

Compound	Concentration (ng/Kg)		%RSD
	4	5	
H	0.16	0.36	77
V	0.60	4.4	152
R	0.64	1.8	95
I	0.16	0.36	77
J	0.33	0.96	98
W	7.1	20	95
B	0.17	0.60	112
S	1.4	6.3	127
K	2.3	3.1	30
L	0.60	1.7	96
M	1.6	3.9	84
N	0.44	0.95	73
X	49	110	77
C	0.064U	1.2	NC
D	21	62	99
E	6.4	19	99
T	160	470	98
O	48	110	78
P	1.3	3.1	82

LDC#: 59625 C21

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: FM

METHOD: ~~GCMS PAH (EPA SW-846 Method 8270D-SIM)~~ 1613 B

Compound	Concentration (ng/Kg)		%RSD
	4	5	
Y	130	260	67
F	230	700	101
U	530	1600	100
O	49	130	91
G	770	2500	106

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LDC#: 59625C21

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:__FT____

METHOD: 1613B

Compound	Concentration (ng/Kg)		%RSD
	17	19	
H	1.3	1.5	14
V	9.1	12	27
A	0.096	0.092	4
R	6.2	6.7	8
I	0.22	0.26	17
J	0.35	0.44	23
W	5.3	6.5	20
B	0.16	0.20	22
S	5.4	5.0	8
K	0.60	0.70	15
L	0.31	0.43	32
M	0.42	0.51	19
N	0.14	0.18	25
X	9.4	10	6
C	0.30	0.40	29
D	2.8	1.7	49
E	1.1	0.80	32
T	25	17	38
O	6.9	7.8	12

LDC#: 59629C21

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: PM

METHOD: 1613B

Compound	Concentration (ng/Kg)		%RSD
	17	19	
P	0.40	0.45	12
Y	21	24	13
F	37	34	8
U	83	75	10
O	16	20	22
G	260	320	21

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Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: September 19, 2024

Parameters: Polychlorinated Biphenyls

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 24G0501

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-SC-032-0-1-20240721	24G0501-61	Sediment	07/21/24
JW-SC-032-1-2-20240721	24G0501-62	Sediment	07/21/24
JW-SC-1032-0-1-20240721	24G0501-64	Sediment	07/21/24
JW-SC-1032-1-2-20240721	24G0501-65	Sediment	07/21/24
JW-SC-025-0-1-20240721	24G0501-71	Sediment	07/21/24
JW-SC-025-1-2-20240721	24G0501-72	Sediment	07/21/24
JW-SC-029-0-1-20240722	24G0501-98	Sediment	07/22/24
JW-SC-029-1-2-20240722	24G0501-99	Sediment	07/22/24

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The reported result was an estimated quantity value.

U (Non-detected): The analyte was analyzed for, but was not detected above the level of the adjusted detection limit or quantitation limit, as appropriate.

UJ (Non-detected): The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

NJ (Tentatively identified): The analyte has been "tentatively identified" or "presumptively identified" as present, and the associated numerical value was the estimated concentration in the sample.

R (Rejected): The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For analytes where average calibration factors were utilized, the percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the analytes, all coefficients of determination (r^2) were greater than or equal to 0.990.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all analytes.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all analytes.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Surrogates/Internal Standards

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Column	Surrogate	%R (53-120)	Affected Analyte	Flag	A or P
JW-SC-029-0-1-20240722	Col 2	Tetrachloro-m-xylene	52.1	All analytes	J (all detects) UJ (all non-detects)	P

All internal standard areas and retention times were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

Samples JW-SC-032-0-1-20240721 and JW-SC-1032-0-1-20240721 and samples JW-SC-032-1-2-20240721 and JW-SC-1032-1-2-20240721 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/Kg)		RPD
	JW-SC-032-0-1-20240721	JW-SC-1032-0-1-20240721	
Aroclor 1248	85.4	89.9	5
Aroclor 1254	130	137	5
Aroclor 1260	73.1	82.5	12

X. Target Analyte Quantitation

Raw data were not reviewed for Stage 2B validation.

XI. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Data qualified due to surrogate %R are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polychlorinated Biphenyls - Data Qualification Summary - SDG 24G0501

Sample	Analyte	Flag	A or P	Reason (Code)
JW-SC-029-0-1-20240722	All analytes	J (all detects) UJ (all non-detects)	P	Surrogates (%R) (13)

Jeld-Wen
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG 24G0501

No Sample Data Qualified in this SDG

Jeld-Wen
Polychlorinated Biphenyls - Field Blank Data Qualification Summary - SDG 24G0501

No Sample Data Qualified in this SDG

LDC #: 59625D3b

SDG #: 24G0501

Laboratory: Analytical Resources, Inc., Tukwila, WA

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

Date: 9/10/24

Page: 1 of 1

Reviewer: EM

2nd Reviewer: AC

METHOD: GC Polychlorinated Biphenyls (EPA SW-846 Method 8082A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A, A	%D RSD ≤ 20, 1x ICV ≤ 20
III.	Continuing calibration	A	CCV ≤ 20
IV.	Laboratory Blanks	A	
V.	Field blanks	N	
VI.	Surrogate spikes 1/13	SW / A	
VII.	Matrix spike/Matrix spike duplicates	N	CS
VIII.	Laboratory control samples	A	LCS/D *
IX.	Field duplicates	SW	D = 1, 3 2, 4
X.	Target analyte quantitation	N	
XI.	Target analyte identification	N	
XII.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID		Lab ID	Matrix	Date
1 +	JW-SC-032-0-1-20240721	D	24G0501-61	Sediment	07/21/24
2 -	JW-SC-032-1-2-20240721	D1	24G0501-62	Sediment	07/21/24
3 +	JW-SC-1032-0-1-20240721	D	24G0501-64	Sediment	07/21/24
4 -	JW-SC-1032-1-2-20240721	D1	24G0501-65	Sediment	07/21/24
5 +	JW-SC-025-0-1-20240721		24G0501-71	Sediment	07/21/24
6 +	JW-SC-025-1-2-20240721		24G0501-72	Sediment	07/21/24
7 +	JW-SC-029-0-1-20240722		24G0501-98	Sediment	07/22/24
8 -	JW-SC-029-1-2-20240722		24G0501-99	Sediment	07/22/24
9					
10					
11					
12					
13					

Notes:

1	BMG0702						
2	BMH0009						

LDC #: 59625 D3b

VALIDATION FINDINDS WORKSHEET

Surrogate Recovery

Page: 1 of 1

Reviewer: FT

METHOD: ✓ GC __ HPLC

Are surrogates required by the method? Yes___ or No____.

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were surrogates spiked into all samples and blanks?

Y (N) N/A Did all surrogate recoveries (%R) meet the QC limits?

13

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	7	col 2	Y	52.1 (53 - 120)	J/UJ/P ND+ Det
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C`	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	Chloro-octadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-Dichlorophenylacetic acid
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate	CC	2,5-Dibromotoluene
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 59625D3b

VALIDATION FINDINGS WORKSHEET
Field Duplicates

METHOD: ✓GC ___ HPLC

Y N N/A Were field duplicate pairs identified in this SDG?

Y N N/A Were target analytes detected in the field duplicate pairs?

Compound	Concentration (ug/kg)		%RPD Limit (≤ %)	Qualification (Parent only)
	1	3		
Z	85.4	89.9	5	
AA	130	137	5	
BB	73.1	82.5	12	

Compound	Concentration ( )		%RPD Limit (≤ %)	Qualification (Parent only)

Compound	Concentration ( )		%RPD Limit (≤ %))	Qualification (Parent only)

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: September 25, 2024

Parameters: Polychlorinated Dioxins/Dibenzofurans

Validation Level: Stage 2B & 4

Laboratory: Analytical Resources, Inc., Tukwila, WA/
Pace Analytical Services, LLC, Minneapolis, MN

Sample Delivery Group (SDG): 24G0501/10702945

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-SC-008-0-1-20240719**	24G0501-01/10702945001**	Sediment	07/19/24
JW-SC-008-3-4-20240719	24G0501-04/10702945002	Sediment	07/19/24
JW-SC-017-0-1-20240719**	24G0501-07/10702945003**	Sediment	07/19/24
JW-SC-017-3-4-20240719	24G0501-10/10702945004	Sediment	07/19/24
JW-SC-040-0-1-20240720	24G0501-13/10702945005	Sediment	07/20/24
JW-SC-040-3-4-20240720**	24G0501-16/10702945006**	Sediment	07/20/24
JW-SC-038-0-1-20240720	24G0501-20/10702945007	Sediment	07/20/24
JW-SC-038-3-4-20240720**	24G0501-23/10702945008**	Sediment	07/20/24
JW-SC-1038-0-1-20240720	24G0501-28/10702945009	Sediment	07/20/24
JW-SC-1038-3-4-20240720	24G0501-29/10702945010	Sediment	07/20/24
JW-SC-043-0-1-20240720	24G0501-30/10702945011	Sediment	07/20/24
JW-SC-043-3-4-20240720	24G0501-33/10702945012	Sediment	07/20/24
JW-SC-041-0-1-20240720**	24G0501-37/10702945013**	Sediment	07/20/24
JW-SC-041-3-4-20240720**	24G0501-40/10702945014**	Sediment	07/20/24
JW-SC-044-0-1-20240720	24G0501-45/10702945015	Sediment	07/20/24
JW-SC-044-3-4-20240720	24G0501-48/10702945016	Sediment	07/20/24
JW-SC-036-0-1-20240720	24G0501-53/10702945017	Sediment	07/20/24
JW-SC-036-3-4-20240720	24G0501-56/10702945018	Sediment	07/20/24
JW-SC-013-0-1-20240721	24G0501-66/10702945019	Sediment	07/21/24
JW-SC-013-3-4-20240721	24G0501-68/10702945020	Sediment	07/21/24
JW-SC-011-0-1-20240721	24G0501-74/10702945021	Sediment	07/21/24
JW-SC-011-3-4-20240721	24G0501-77/10702945022	Sediment	07/21/24
JW-SC-014-0-1-20240721	24G0501-80/10702945023	Sediment	07/21/24
JW-SC-014-3-4-20240721	24G0501-83/10702945024	Sediment	07/21/24
JW-SC-004-0-1-20240722	24G0501-86/10702945025	Sediment	07/22/24

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-SC-004-3-4-20240722	24G0501-89/10702945026	Sediment	07/22/24
JW-SC-019-0-1-20240722	24G0501-92/10702945027	Sediment	07/22/24
JW-SC-019-3-4-20240722	24G0501-95/10702945028	Sediment	07/22/24
JW-SC-008-3-4-20240719MS	24G0501-04MS/10702945002MS	Sediment	07/19/24
JW-SC-008-3-4-20240719MSD	24G0501-04MSD/10702945002MSD	Sediment	07/19/24
JW-SC-011-3-4-20240721MS	24G0501-77MS/10702945022MS	Sediment	07/21/24
JW-SC-011-3-4-20240721MSD	24G0501-77MSD/10702945022MSD	Sediment	07/21/24

**Indicates sample underwent Stage 4 validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for High Resolution Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Dioxins/Dibenzofurans by Environmental Protection Agency (EPA) Method 1613B

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Stage 4 data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The reported result was an estimated quantity value.

U (Non-detected): The analyte was analyzed for, but was not detected above the level of the adjusted detection limit or quantitation limit, as appropriate.

UJ (Non-detected): The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

NJ (Tentatively identified): The analyte has been "tentatively identified" or "presumptively identified" as present, and the associated numerical value was the estimated concentration in the sample.

R (Rejected): The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25%.

The static resolving power was at least 10,000 (10% valley definition).

III. Initial Calibration and Initial Calibration Verification

A five point initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all analytes and less than or equal to 35.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The minimum S/N ratio was greater than or equal to 10 for each analyte and labeled compound associated to samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

The percent differences (%D) of the initial calibration verification (ICV) standard were within the QC limits for all analytes and labeled compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration results were within the QC limits for all analytes and labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The minimum S/N ratio was greater than or equal to 10 for each analyte and labeled compound associated to samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Analyte	Concentration (ng/Kg)	Associated Samples
Blank 114173	08/08/24	Total TCDF Total TCDD 1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD 1,2,3,4,6,7,8-HpCDD Total HpCDD OCDD	0.070 0.071 0.040 0.095 0.063 0.063 0.32	JW-SC-008-0-1-20240719** JW-SC-008-3-4-20240719 JW-SC-017-0-1-20240719** JW-SC-017-3-4-20240719 JW-SC-040-0-1-20240720 JW-SC-040-3-4-20240720** JW-SC-038-0-1-20240720 JW-SC-038-3-4-20240720** JW-SC-1038-0-1-20240720 JW-SC-1038-3-4-20240720 JW-SC-043-0-1-20240720 JW-SC-043-3-4-20240720 JW-SC-041-0-1-20240720** JW-SC-041-3-4-20240720** JW-SC-044-0-1-20240720 JW-SC-044-3-4-20240720 JW-SC-036-0-1-20240720 JW-SC-036-3-4-20240720 JW-SC-013-0-1-20240721 JW-SC-013-3-4-20240721
Blank 114175	08/08/24	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD 1,2,3,4,6,7,8-HpCDD Total HpCDD OCDD	0.063 0.083 0.049 0.11 0.32	JW-SC-011-0-1-20240721 JW-SC-011-3-4-20240721 JW-SC-014-0-1-20240721 JW-SC-014-3-4-20240721 JW-SC-004-0-1-20240722 JW-SC-004-3-4-20240722 JW-SC-019-0-1-20240722
Blank 114274	08/15/24	Total TCDD OCDD	0.10 0.81	JW-SC-019-3-4-20240722

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration (ng/Kg)	Modified Final Concentration (ng/Kg)
JW-SC-008-0-1-20240719**	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD	0.081 0.17	0.081U 0.17U
JW-SC-008-3-4-20240719	Total TCDF Total TCDD 1,2,3,4,7,8-HxCDD 1,2,3,4,6,7,8-HpCDD OCDD	0.12 0.13 0.062 0.097 0.72	0.12J 0.13J 0.062U 0.097U 0.72U
JW-SC-017-0-1-20240719**	1,2,3,4,7,8-HxCDD	0.41	0.41U

Sample	Analyte	Reported Concentration (ng/Kg)	Modified Final Concentration (ng/Kg)
JW-SC-017-3-4-20240719	1,2,3,4,7,8-HxCDD 1,2,3,4,6,7,8-HpCDD	0.079 0.24	0.079U 0.24U
JW-SC-040-0-1-20240720	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD	0.11 0.46	0.11U 0.46U
JW-SC-038-0-1-20240720	1,2,3,4,7,8-HxCDD	0.42	0.42U
JW-SC-043-0-1-20240720	1,2,3,4,7,8-HxCDD	0.46	0.46U
JW-SC-043-3-4-20240720	1,2,3,7,8,9-HxCDF	0.17	0.17U
JW-SC-044-0-1-20240720	1,2,3,4,7,8-HxCDD	0.24	0.24U
JW-SC-044-3-4-20240720	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD	0.17 0.47	0.17U 0.47U
JW-SC-013-0-1-20240721	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD	0.12 0.15	0.12U 0.15U
JW-SC-013-3-4-20240721	1,2,3,4,7,8-HxCDD	0.15	0.15U
JW-SC-011-0-1-20240721	1,2,3,4,7,8-HxCDD	0.41	0.41U
JW-SC-011-3-4-20240721	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD	0.066 0.094	0.066U 0.094U
JW-SC-014-0-1-20240721	1,2,3,7,8,9-HxCDF	0.31	0.31U
JW-SC-014-3-4-20240721	1,2,3,4,7,8-HxCDD	0.16	0.16U
JW-SC-004-0-1-20240722	1,2,3,4,7,8-HxCDD	0.27	0.27U
JW-SC-004-3-4-20240722	1,2,3,7,8,9-HxCDF	0.15	0.15U

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

Samples JW-SC-038-0-1-20240720 and JW-SC-1038-0-1-20240720 and samples JW-SC-038-3-4-20240720** and JW-SC-1038-3-4-20240720 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ng/Kg)		RPD
	JW-SC-038-0-1-20240720	JW-SC-1038-0-1-20240720	
2,3,7,8-TCDF	0.35	0.47	29
Total TCDF	3.2	3.0	6
Total TCDD	1.9	3.8	67
1,2,3,7,8-PeCDF	0.24	0.20	18
2,3,4,7,8-PeCDF	0.64	0.57	12
Total PeCDF	11	12	9
1,2,3,7,8-PeCDD	0.29	0.33	13
Total PeCDD	2.3	3.2	33
1,2,3,4,7,8-HxCDF	1.6	1.3	21
1,2,3,6,7,8-HxCDF	1.1	1.2	9
2,3,4,6,7,8-HxCDF	1.7	2.0	16
1,2,3,7,8,9-HxCDF	0.49	0.34	36
Total HxCDF	38	22	53
1,2,3,4,7,8-HxCDD	0.42	0.69	49
1,2,3,6,7,8-HxCDD	4.4	4.5	2
1,2,3,7,8,9-HxCDD	1.3	1.9	37
Total HxCDD	27	30	11
1,2,3,4,6,7,8-HpCDF	21	21	0
1,2,3,4,7,8,9-HpCDF	0.96	1.1	14
Total HpCDF	54	22	84
1,2,3,4,6,7,8-HpCDD	69	56	21
Total HpCDD	150	120	22
1,2,3,4,6,7,8-HpCDF	22	24	9
OCDD	500	450	11

Analyte	Concentration (ng/Kg)		RPD
	JW-SC-038-3-4-20240720**	JW-SC-1038-3-4-20240720	
2,3,7,8-TCDF	2.8	2.4	15
Total TCDF	12	12	0

Analyte	Concentration (ng/Kg)		RPD
	JW-SC-038-3-4-20240720**	JW-SC-1038-3-4-20240720	
2,3,7,8-TCDD	0.13	0.16	21
Total TCDD	7.2	7.1	1
1,2,3,7,8-PeCDF	0.68	0.77	12
2,3,4,7,8-PeCDF	1.5	1.7	12
Total PeCDF	21	29	32
1,2,3,7,8-PeCDD	0.68	0.96	34
Total PeCDD	13	13	0
1,2,3,4,7,8-HxCDF	2.9	3.3	13
1,2,3,6,7,8-HxCDF	2.3	2.8	20
2,3,4,6,7,8-HxCDF	2.9	2.4	19
1,2,3,7,8,9-HxCDF	0.69	1.1	46
Total HxCDF	36	47	27
1,2,3,4,7,8-HxCDD	1.6	2.1	27
1,2,3,6,7,8-HxCDD	10	13	26
1,2,3,7,8,9-HxCDD	3.7	4.9	28
Total HxCDD	89	120	30
1,2,3,4,6,7,8-HpCDF	45	58	25
1,2,3,4,7,8,9-HpCDF	2.3	3.5	41
Total HpCDF	48	61	24
1,2,3,4,6,7,8-HpCDD	270	370	31
Total HpCDD	570	790	32
1,2,3,4,6,7,8-HpCDF	100	160	46
OCDD	3300	4500	31

X. Labeled Compounds

All labeled compound percent recoveries (%R) and ion abundance ratios (IAR) were within QC limits with the following exceptions:

Sample	Labeled Compound	%R (26-123)	Affected Analyte	Flag	A or P
JW-SC-014-3-4-20240721	1,2,3,6,7,8-HxCDF-13C	124	1,2,3,6,7,8-HxCDF Total HxCDF	J (all detects) J (all detects)	P

XI. Target Analyte Quantitation

All target analyte quantitations met validation criteria with the following exceptions:

Sample	Analyte	Flag	A or P
All samples in SDG 24G0501/10702945	All analytes flagged "I" by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A

Sample	Analyte	Finding	Flag	A or P
JW-SC-1038-0-1-20240720 JW-SC-043-3-4-20240720 JW-SC-044-3-4-20240720 JW-SC-036-0-1-20240720 JW-SC-011-0-1-20240721 JW-SC-019-3-4-20240722	1,2,3,4,7,8-HxCDF	All analytes flagged "P" by the laboratory due to polychlorinated diphenyl ether (PCDPE) interference.	J (all detects)	A
JW-SC-014-0-1-20240721 JW-SC-004-0-1-20240722 JW-SC-004-3-4-20240722	1,2,3,6,7,8-HxCDF	All analytes flagged "P" by the laboratory due to polychlorinated diphenyl ether (PCDPE) interference.	J (all detects)	A

Sample	Analyte	Finding	Criteria	Flag	A or P
JW-SC-038-3-4-20240720** JW-SC-1038-3-4-20240720	OCDD	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	P

Raw data were not reviewed for Stage 2B validation.

XII. Target Analyte Identification

All target analyte identifications met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Data qualified due to laboratory blank contamination, labeled compound %R, results reported by the laboratory as EMPCs, PCDPE interference, and results exceeding calibration range, are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Data Qualification Summary - SDG 24G0501/10702945

Sample	Analyte	Flag	A or P	Reason (Code)
JW-SC-014-3-4-20240721	1,2,3,6,7,8-HxCDF Total HxCDF	J (all detects) J (all detects)	P	Labeled compound (%R) (19)
All samples in SDG 24G0501/10702945	All analytes flagged "I" by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A	Target analyte quantitation (EMPC) (23)
JW-SC-1038-0-1-20240720 JW-SC-043-3-4-20240720 JW-SC-044-3-4-20240720 JW-SC-036-0-1-20240720 JW-SC-011-0-1-20240721 JW-SC-019-3-4-20240722	1,2,3,4,7,8-HxCDF	J (all detects)	A	Target analyte quantitation (PCDPE) (24)
JW-SC-014-0-1-20240721 JW-SC-004-0-1-20240722 JW-SC-004-3-4-20240722	1,2,3,6,7,8-HxCDF	J (all detects)	A	Target analyte quantitation (PCDPE) (24)
JW-SC-038-3-4-20240720** JW-SC-1038-3-4-20240720	OCDD	J (all detects)	P	Target analyte quantitation (exceeded range) (20)

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG 24G0501/10702945

Sample	Analyte	Modified Final Concentration (ng/Kg)	Code
JW-SC-008-0-1-20240719**	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD	0.081U 0.17U	7
JW-SC-008-3-4-20240719	Total TCDF Total TCDD 1,2,3,4,7,8-HxCDD 1,2,3,4,6,7,8-HpCDD OCDD	0.12J 0.13J 0.062U 0.097U 0.72U	7
JW-SC-017-0-1-20240719**	1,2,3,4,7,8-HxCDD	0.41U	7
JW-SC-017-3-4-20240719	1,2,3,4,7,8-HxCDD 1,2,3,4,6,7,8-HpCDD	0.079U 0.24U	7
JW-SC-040-0-1-20240720	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD	0.11U 0.46U	7
JW-SC-038-0-1-20240720	1,2,3,4,7,8-HxCDD	0.42U	7

Sample	Analyte	Modified Final Concentration (ng/Kg)	Code
JW-SC-043-0-1-20240720	1,2,3,4,7,8-HxCDD	0.46U	7
JW-SC-043-3-4-20240720	1,2,3,7,8,9-HxCDF	0.17U	7
JW-SC-044-0-1-20240720	1,2,3,4,7,8-HxCDD	0.24U	7
JW-SC-044-3-4-20240720	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD	0.17U 0.47U	7
JW-SC-013-0-1-20240721	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD	0.12U 0.15U	7
JW-SC-013-3-4-20240721	1,2,3,4,7,8-HxCDD	0.15U	7
JW-SC-011-0-1-20240721	1,2,3,4,7,8-HxCDD	0.41U	7
JW-SC-011-3-4-20240721	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD	0.066U 0.094U	7
JW-SC-014-0-1-20240721	1,2,3,7,8,9-HxCDF	0.31U	7
JW-SC-014-3-4-20240721	1,2,3,4,7,8-HxCDD	0.16U	7
JW-SC-004-0-1-20240722	1,2,3,4,7,8-HxCDD	0.27U	7
JW-SC-004-3-4-20240722	1,2,3,7,8,9-HxCDF	0.15U	7

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG 24G0501/10702945

No Sample Data Qualified in this SDG

LDC #: 59625D21 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/11/24
SDG #: 24G0501/10702945 Stage 2B/4 Page: 1 of 2
Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer: [illegible]
Sub-Laboratory: Pace Analytical Services, LLC, Minneapolis, MN 2nd Reviewer: [illegible]
METHOD: HRGC/HRMS Polychlorinated Dioxins/Dibenzofurans (EPA Method 1613B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	%RSD ≤20/35 ICV = QC limit
IV.	Continuing calibration	A	CCV = QC limit
V.	Laboratory Blanks	SW	
VI.	Field blanks	N	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS ID
IX.	Field duplicates	SW	D = 7, 9 & 10
X.	Labeled Compounds	SW	
XI.	Target analyte quantitation	SW	Not reviewed for Stage 2B validation.
XII.	Target analyte identification	A	Not reviewed for Stage 2B validation.
XIII.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Stage 4 validation

	Client ID		Lab ID	Matrix	Date
1	JW-SC-008-0-1-20240719**	10702945001	24G0501-01**	Sediment	07/19/24
2	JW-SC-008-3-4-20240719	002	24G0501-04	Sediment	07/19/24
3	JW-SC-017-0-1-20240719**	003	24G0501-07**	Sediment	07/19/24
4	JW-SC-017-3-4-20240719	004	24G0501-10	Sediment	07/19/24
5	JW-SC-040-0-1-20240720	005	24G0501-13	Sediment	07/20/24
6	JW-SC-040-3-4-20240720**	006	24G0501-16**	Sediment	07/20/24
7	JW-SC-038-0-1-20240720	D 007	24G0501-20	Sediment	07/20/24
8	JW-SC-038-3-4-20240720**	D1 008	24G0501-23**	Sediment	07/20/24
9	JW-SC-1038-0-1-20240720	D 009	24G0501-28	Sediment	07/20/24
10	JW-SC-1038-3-4-20240720	D1 010	24G0501-29	Sediment	07/20/24
11	JW-SC-043-0-1-20240720	011	24G0501-30	Sediment	07/20/24
12	JW-SC-043-3-4-20240720	012	24G0501-33	Sediment	07/20/24
13	JW-SC-041-0-1-20240720**	013	24G0501-37**	Sediment	07/20/24
14	JW-SC-041-3-4-20240720**	014	24G0501-40**	Sediment	07/20/24
15	JW-SC-044-0-1-20240720	015	24G0501-45	Sediment	07/20/24
16	JW-SC-044-3-4-20240720	016	24G0501-48	Sediment	07/20/24

LDC #: 59625D21 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/11/24

SDG #: 24G0501/10702945 Stage 2B/4 Page: 2 of 2

Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer:

Sub-Laboratory: Pace Analytical Services, LLC, Minneapolis, MN 2nd Reviewer:

METHOD: HRGC/HRMS Polychlorinated Dioxins/Dibenzofurans (EPA Method 1613B)

	Client ID		Lab ID	Matrix	Date
17 1	JW-SC-039-0-1-20240720	10702945 017	24G0501-53	Sediment	07/20/24
18 1	JW-SC-036-3-4-20240720	018	24G0501-56	Sediment	07/20/24
19 1	JW-SC-013-0-1-20240721	019	24G0501-66	Sediment	07/21/24
20 1	JW-SC-013-3-4-20240721	020	24G0501-68	Sediment	07/21/24
21 2	JW-SC-011-0-1-20240721	021	24G0501-74	Sediment	07/21/24
22 2	JW-SC-011-3-4-20240721	022	24G0501-77	Sediment	07/21/24
23 2	JW-SC-014-0-1-20240721	023	24G0501-80	Sediment	07/21/24
24 2	JW-SC-014-3-4-20240721	024	24G0501-83	Sediment	07/21/24
25 2	JW-SC-004-0-1-20240722	025	24G0501-86	Sediment	07/22/24
26 2	JW-SC-004-3-4-20240722	026	24G0501-89	Sediment	07/22/24
27 2	JW-SC-019-0-1-20240722	027	24G0501-92	Sediment	07/22/24
28 3	JW-SC-019-3-4-20240722	028	24G0501-95	Sediment	07/22/24
29 1	JW-SC-008-3-4-20240719MS	002 MS	24G0501-04MS	Sediment	07/19/24
30 1	JW-SC-008-3-4-20240719MSD	002 MSD	24G0501-04MSD	Sediment	07/19/24
31 2	JW-SC-011-3-4-20240721MS	022 MS	24G0501-77MS	Sediment	07/21/24
32 2	JW-SC-011-3-4-20240721MSD	022 MSD	24G0501-77MSD	Sediment	07/21/24
33					
34					
35					
36					

Notes:

1	Blank 114173	MB1					
2	114175	MB2					
3	114274	MB3					

LDC #: 59625D21

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: FT
2nd Reviewer:

Method: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Was PFK exact mass 380.9760 verified?	✓			
Were the retention time windows established for all homologues?	✓			
Was the chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomers ≤ 25% ?	✓			
Is the static resolving power at least 10,000 (10% valley definition)?	✓			
Was the mass resolution adequately check with PFK?	✓			
Was the presence of 1,2,8,9-TCDD and 1,3,4,6,8-PeCDF verified?	✓			
IIIa. Initial calibration				
Was the initial calibration performed at 5 concentration levels?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20% for unlabeled analytes and ≤ 35% for labeled analytes ?	✓			
Did all calibration standards meet the Ion Abundance Ratio criteria?	✓			
Was the signal to noise ratio for each target compound ≥ 2.5 and for each recovery and internal standard ≥ 10?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all concentration for unlabeled and labeled analytes within QC limits?	✓			
IV. Continuing calibration				
Was a contiuning calibration performed at the beginning and end of each 12 hour period?	✓			
Were all concentration for unlabeled and labeled analytes within QC limits?	✓			
Did all routine calibration standards meet the Ion Abundance Ratio criteria?	✓			
Was the signal to noise ratio for each target compound and for each recovery and internal standard ≥ 10?	✓			
V. Laboratory Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank performed for each matrix and whenever a sample extraction was performed?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet?	✓			
VI. Field blanks				
Field blanks were identified in this SDG.		✓		
Target compounds were detected in the field blanks.			✓	
VII. Matrix spike/Matrix spike duplicates				

Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓				
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓				
VIII. Laboratory control samples					
Was an LCS analyzed per extraction batch?	✓				
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓				
IX. Field duplicates					
Field duplicate pairs were identified in this SDG.	✓				
Target compounds were detected in the field duplicates.	✓				
X. Internal standards					
Were internal standard recoveries within the ~~40-135~~ % criteria?		✓			&c
Was the minimum S/N ratio of all internal standard peaks ≥ 10?	✓				
XI. Compound quantitation					
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓				
XII. Target compound identification					
For 2,3,7,8 substituted congeners with associated labeled standards, were the retention times of the two quantitation peaks within -1 to 3 sec. of the RT of the labeled standard?	✓				
For 2,3,7,8 substituted congeners without associated labeled standards, were the relative retention times of the two quantitation peaks within 0.005 time units of the RRT measured in the routine calibration?	✓				
For non-2,3,7,8 substituted congeners, were the retention times of the two quantitation peaks within RT established in the performance check solution?	✓				
Did compound spectra contain all characteristic ions listed in the table attached?	✓				
Was the Ion Abundance Ratio for the two quantitation ions within criteria?	✓				
Was the signal to noise ratio for each target compound and labeled standard ≥ 2.5?	✓				
Does the maximum intensity of each specified characteristic ion coincide within ± 2 seconds (includes labeled standards)?	✓				
For PCDF identification, was any signal (S/N ≥ 2.5, at ± seconds RT) detected in the corresponding PCDPE channel?	✓				
Was an acceptable lock mass recorded and monitored?	✓				
XIII. System performance					
System performance was found to be acceptable.	✓				
XIV. Overall assessment of data					
Overall assessment of data was found to be acceptable.	✓				

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

A. 2,3,7,8-TCDD	F. 1,2,3,4,6,7,8-HpCDD	K. 1,2,3,4,7,8-HxCDF	P. 1,2,3,4,7,8,9-HpCDF	U. Total HpCDD
B. 1,2,3,7,8-PeCDD	G. OCDD	L. 1,2,3,6,7,8-HxCDF	Q. OCDF	V. Total TCDF
C. 1,2,3,4,7,8-HxCDD	H. 2,3,7,8-TCDF	M. 2,3,4,6,7,8-HxCDF	R. Total TCDD	W. Total PeCDF
D. 1,2,3,6,7,8-HxCDD	I. 1,2,3,7,8-PeCDF	N. 1,2,3,7,8,9-HxCDF	S. Total PeCDD	X. Total HxCDF
E. 1,2,3,7,8,9-HxCDD	J. 2,3,4,7,8-PeCDF	O. 1,2,3,4,6,7,8-HpCDF	T. Total HxCDD	Y. Total HpCDF

Notes:_____

LDC #: 59625D21

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: FT

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
Y N N/A Was the method blank contaminated?

(7)

Blank extraction date: 8/8/24 **Blank analysis date:** 8/13/24 **Associated samples:** 1 → 20

Conc. units: ng/kg

Compound	Blank ID		Sample Identification							
	MB1	SX	1	2	3	4	5	6	7	8
Y	0.070	0.35		0.12 J						
R	0.071	0.355		0.13 J						
N	0.040	0.20	0.081 U				0.11 U			
C	0.095	0.475	0.17 U	0.062 U	0.41 U	0.079 U	0.46 U		0.42 U	
F	0.063	0.315		0.097 U		0.24 U				
U	0.063	0.315								
G	0.32	1.6		0.72 U						

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 59625D21

VALIDATION FINDINGS WORKSHEET
Blanks

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
Y N N/A Was the method blank contaminated?

(7)

Blank extraction date: 8/8/24 **Blank analysis date:** 8/13/24 **Associated samples:** 1-7 20

Conc. units: ng/kg

Compound	Blank ID		Sample Identification							
	MB1	5X	9	10	11	12	13	14	15	16
V	0.070	0.35								
R	0.071	0.355								
N	0.040	0.20				0.17 U				0.17U
C	0.095	0.475			0.46U				0.24U	0.47U
F	0.063	0.315								
U	0.063	0.315								
G	0.32	1.6								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 59625 D21

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: BJ

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
Y N N/A Was the method blank contaminated?

(7)

Blank extraction date: 8/8/24 **Blank analysis date:** 8/13/24
Conc. units: ng/kg **Associated samples:** 17 20

Compound	Blank ID	Sample Identification								
	MB1	5X	17	18	19	20				
V	0.070	0.35								
R	0.071	0.355								
N	0.040	0.20			0.124					
C	0.095	0.475			0.154	0.154				
F	0.063	0.315								
U	0.063	0.315								
G	0.32	1.6								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 59625D21

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: CZ

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

(7)

Blank extraction date: 8/8/24 Analysis date: 8/13/24
Conc. units: ng/kg Associated Samples: 21 → 27

Compound	Blank ID	Sample Identification								
	MB2	5X	21	22	23	24	25	26		
N	0.063	0.315		0.066U	0.31U			0.15U		
C	0.083	0.415	0.41U	0.094U	-	0.16U	0.27U			
F	0.049	0.245		-						
U	0.11	0.55		-						
G	0.32	1.6		-						

Blank extraction date: 8/15/24 Analysis date: 8/20/24
Conc. units: ng/kg Associated Samples: 28 75X

Compound	Blank ID	Sample Identification								
	MB3	5X								
R	0.10	0.50								
G	0.81	4.05								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 59625 B2 1

VALIDATION FINDINGS WORKSHEET
Labeld Compound

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Are all labeled compound recoveries were within QC limits?
(Y) N N/A Was the S/N ratio all internal standard peaks ≥ 10?

(19)

#	Date	Lab ID/Reference	Internal Standard	% Recovery	QC limit (Limit: ~~40-135%~~)	Qualifications
		24	L-13C	124	(26-123)	~~Idt/qual/p~~ FT Det
					( )	Idt / p
					( )	qual L, X
					( )	
					( )	
					( )	
					( )	
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LDC#: 59625D21

VALIDATION FINDINGS WORKSHEET
Field Duplicates

METHOD: 1613B

Compound	Concentration (ng/Kg)		%RSD
	7	9	
H	0.35	0.47	29
V	3.2	3.0	6
R	1.9	3.8	67
I	0.24	0.20	18
J	0.64	0.57	12
W	11	12	9
B	0.29	0.33	13
S	2.3	3.2	33
K	1.6	1.3	21
L	1.1	1.2	9
M	1.7	2.0	16
N	0.49	0.34	36
X	38	22	53
C	0.42	0.69	49
D	4.4	4.5	2
E	1.3	1.9	37
T	27	30	11
O	21	21	0
P	0.96	1.1	14

LDC#: 59625 D21

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer: EF

METHOD: 1613B

Compound	Concentration (ng/Kg)		%RSD
	7	9	
Y	54	22	84
F	69	56	21
U	150	120	22
O	22	24	9
G	500	450	11

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LDC#: 59625D21

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: FT

METHOD: 1613B

Compound	Concentration (ng/Kg)		%RSD
	8	10	
H	2.8	2.4	15
V	12	12	0
A	0.13	0.16	21
R	7.2	7.1	1
I	0.68	0.77	12
J	1.5	1.7	12
W	21	29	32
B	0.68	0.96	34
S	13	13	0
K	2.9	3.3	13
L	2.3	2.8	20
M	2.9	2.4	19
N	0.69	1.1	46
X	36	47	27
C	1.6	2.1	27
D	10	13	26
E	3.7	4.9	28
T	89	120	30
O	45	58	25
P	2.3	3.5	41

LDC#: 59625D21

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: PD

METHOD: 1613B

Compound	Concentration (ng/Kg)		%RSD
	8	10	
Y	48	61	24
F	270	370	31
U	570	790	32
O	100	160	46
G	3300	4500	31

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LDC #: 59625D21

VALIDATION FINDINGS WORKSHEET
Target Analyte Quantitation

Reviewer: FT

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the compound?
Y N N/A Compound quantitation and CRQLs were adjusted to reflect all sample dilutions and dry weight factors (if necessary).

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		All	all analytes qualified as EMPC by the laboratory	I	J dw / A (23)
		9, 12, 16, 17, 21, 28	analyte qualified P by the laboratory as PCDE interference		J dw / A (24) qual K
		23, 25, 26	↓		J dw / A (24) qual L
		8, 10	G- x'd cal Range		J dw / A P (20)

Comments: See sample calculation verification worksheet for recalculations

LDC #: 59625 D21

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FZ

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs,

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard
X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported RRF (CS3 std) 10/50/100	Recalculated RRF (CS3 std)	Reported %RSD	Recalculated %RSD
1	ICAL	4/23/24	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.9142	0.9142	0.8966	0.8966	3.43	3.43
	U240423		2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	0.9390	0.9390	0.9585	0.9585	4.40	4.40
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	0.9363	0.9363	0.9323	0.9323	4.42	4.42
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	1.0635	1.0635	1.0223	1.0223	6.49	6.49
			OCDF (^{13}C-OCDD)	0.9796	0.9796	0.9452	0.9452	2.89	2.89
2			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)						
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)						
			OCDF (^{13}C-OCDD)						
3			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)						
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)						
			OCDF (^{13}C-OCDD)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 59625D21

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs,

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard
X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported RRF (CS3 std) 10/50/100	Recalculated RRF (CS3 std)	Reported %RSD	Recalculated %RSD
1	ICAL	8/8/24	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.9452	0.9452	0.9264	0.9264	4.34	4.34
	L240808		2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	0.9977	0.9977	0.9831	0.9831	4.45	4.45
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	1.0279	1.0279	1.0456	1.0456	3.45	3.45
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	0.9893	0.9893	0.9786	0.9786	2.05	2.05
			OCDF (^{13}C-OCDD)	1.0559	1.0559	1.0475	1.0475	6.60	6.60
2			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)						
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)						
			OCDF (^{13}C-OCDD)						
3			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)						
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)						
			OCDF (^{13}C-OCDD)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 59625 D21

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	True Amount (initial)	Reported Amount (CC)	Recalculated Amount (CC)	Reported %D	Recalculated %D
1	CCV	8/12/24	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	10.0	10.2	10.2		
	1240812B_01		2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	10.0	10.5	10.5		
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	50.0	48.3	48.3		
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	50.0	49.7	49.7		
			OCDF (^{13}C-OCDD)	100	104	104		
2	CCV	8/12/24	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	10.0	10.0	10.0		
	1240812A_18		2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	10.0	10.7	10.7		
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	50.0	50.7	50.7		
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	50.0	47.0	47.0		
			OCDF (^{13}C-OCDD)	100	92.0	92.0		
3			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)					
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)					
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)					
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)					
			OCDF (^{13}C-OCDD)					

Comments: Refer to Routine Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 59675D21

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: [illegible]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613**B**)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSR - SR)/SA Where: SSR = Spiked sample result, SR = Sample result
SA = Spike added

RPD = I MSR - MSDR I * 2/(MSR + MSDR) MSR = Matrix spike percent recovery MSDR = Matrix spike duplicate percent recovery

MS/MSD samples: 29 & 30

Compound	Spike Added (ng)		Sample Concentration (ng)	Spiked Sample Concentration (ng)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalc
2,3,7,8-TCDD	0.20	0.20	ND	0.208	0.226	104	104	113	113	8.3	8.3
1,2,3,7,8-PeCDD	1.0	1.0	ND	0.90	0.96	90	90	96	96	6.9	6.9
1,2,3,4,7,8-HxCDD	1.0	1.0	0.0020J	1.09	1.17	109	109	117	117	6.3	6.3
1,2,3,4,7,8,9-HpCDF	1.0	1.0	ND	0.87	0.92	87	87	92	92	5.6	5.6
OCDF	2.0	2.0	ND	2.17	2.31	109	109	115	115	6.0	6.0

Comments: Refer to Matrix Spike/Matrix Spike Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 59625D21

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: FT

METHOD: GC/MS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration
SA = Spike added

RPD = I LCS - LCSD I * 2/(LCS + LCSD) LCS = Laboraotry control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS ID: LCS - 114174

Compound	Spike Added (ng/kg)		Spiked Sample Concentration (ng/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalc
2,3,7,8-TCDD	10	NA	10.9		109					
1,2,3,7,8-PeCDD	50		92		92					
1,2,3,4,7,8-HxCDD	50		56		112					
1,2,3,4,7,8,9-HpCDF	50		45		90					
OCDF	100		114		114					

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 59625D21

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

RRF = Relative Response Factor (average) from the initial calibration

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

Example:

Sample I.D. #1, OCDF:

Conc. = $\frac{(1.59 \times 10^5 + 1.89 \times 10^5)(200)(20)}{(8.72 \times 10^6 + 9.61 \times 10^6)(1.0959)(24.1)}$

= 2.98 ng/kg

#	Sample ID	Compound	Reported Concentration (ng/kg)	Calculated Concentration (ng/kg)	Qualification
	#1	OCDF	3.0	2.98	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: September 19, 2024

Parameters: Polychlorinated Biphenyls

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA

Sample Delivery Group (SDG): 24G0502

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-SC-030-0-1-20240722	24G0502-02	Sediment	07/22/24
JW-SC-030-1-2-20240722	24G0502-03	Sediment	07/22/24
JW-SC-031-0-1-20240722	24G0502-05	Sediment	07/22/24
JW-SC-031-1-2-20240722	24G0502-06	Sediment	07/22/24
JW-RB-20240722	24G0502-08	Water	07/22/24
JW-SC-030-0-1-20240722MS	24G0502-02MS	Sediment	07/22/24
JW-SC-030-1-2-20240722MS	24G0502-03MS	Sediment	07/22/24
JW-SC-030-1-2-20240722MSD	24G0502-03MSD	Sediment	07/22/24
JW-SC-030-0-1-20240722MSD	24G0502-02MSD	Sediment	07/22/24
JW-RB-20240722MS	24G0502-08MS	Water	07/22/24
JW-RB-20240722MSD	24G0502-08MSD	Water	07/22/24

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The reported result was an estimated quantity value.

U (Non-detected): The analyte was analyzed for, but was not detected above the level of the adjusted detection limit or quantitation limit, as appropriate.

UJ (Non-detected): The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

NJ (Tentatively identified): The analyte has been "tentatively identified" or "presumptively identified" as present, and the associated numerical value was the estimated concentration in the sample.

R (Rejected): The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all analytes.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all analytes.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all analytes with the following exceptions:

Date	Standard	Column	Analyte	%D	Associated Samples	Flag	A or P
08/02/24	SMH0057-CCV1	Col 1 Col 2	Aroclor 1248 Aroclor 1248	44.3 33.6	All water samples in SDG 24G0502	UJ (all non-detects) UJ (all non-detects)	A

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample JW-RB-20240722 was identified as a rinsate blank. No contaminants were found.

VI. Surrogates/Internal Standards

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

All internal standard areas and retention times were within QC limits with the following exceptions:

Sample	Internal Standards	Column	Area (1030526-4122104)	Affected Analyte	Flag	A or P
JW-RB-20240722	Hexabromobiphenyl	Col 1	902035	Aroclor 1254 Aroclor 1260 Aroclor 1262 Aroclor 1268	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS %R (60-140)	MSD %R (60-140)	Flag	A or P
JW-RB-20240722MS/MSD (JW-RB-20240722)	Aroclor 1260	-	53.3	UJ (all non-detects)	A

Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Analyte	%R (60-140)	Affected Analyte	Flag	A or P
BMG0595-LCS (All water samples in SDG 24G0502)	Aroclor 1016	58.0	Aroclor 1016 Aroclor 1221 Aroclor 1232 Aroclor 1242	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Target Analyte Quantitation

The sample results for detected analytes from the two columns were within 40% relative percent difference (RPD) with the following exceptions:

Sample	Analyte	RPD	Flag	A or P
JW-SC-030-0-1-20240722	Aroclor 1248	43.2	J (all detects)	A

Sample	Analyte	RPD	Flag	A or P
JW-SC-030-1-2-20240722	Aroclor 1254	58.1	J (all detects)	A

Raw data were not reviewed for Stage 2B validation.

XI. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Data qualified due to continuing calibration %D, internal standard %R, MS/MSD %R, LCS %R, and RPD between two columns are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polychlorinated Biphenyls - Data Qualification Summary - SDG 24G0502

Sample	Analyte	Flag	A or P	Reason (Code)
JW-RB-20240722	Aroclor 1248	UJ (all non-detects)	A	Continuing calibration (%D) (5)
JW-RB-20240722	Aroclor 1254 Aroclor 1260 Aroclor 1262 Aroclor 1268	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P	Internal standards (area) (19)
JW-RB-20240722	Aroclor 1260	UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R) (8)
JW-RB-20240722	Aroclor 1016 Aroclor 1221 Aroclor 1232 Aroclor 1242	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P	Laboratory control samples (%R) (10)
JW-SC-030-0-1-20240722	Aroclor 1248	J (all detects)	A	Target analyte quantitation (RPD between two columns) (12)
JW-SC-030-1-2-20240722	Aroclor 1254	J (all detects)	A	Target analyte quantitation (RPD between two columns) (12)

Jeld-Wen
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG 24G0502

No Sample Data Qualified in this SDG

Jeld-Wen
Polychlorinated Biphenyls - Field Blank Data Qualification Summary - SDG 24G0502

No Sample Data Qualified in this SDG

LDC #: 59625E3b

SDG #: 24G0502

Laboratory: Analytical Resources, Inc., Tukwila, WA

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

Date: 9/10/24

Page: 1 of 1

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC Polychlorinated Biphenyls (EPA SW-846 Method 8082A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / Δ	
II.	Initial calibration/ICV	Δ /	%RSD ≤ 20 ICV ≤ 30
III.	Continuing calibration	SW	
IV.	Laboratory Blanks	Δ	
V.	Field blanks	ND	RB = 5
VI.	Surrogate spikes / 15	Δ / SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	SW	LCS / D
IX.	Field duplicates	N	
X.	Target analyte quantitation	SW	
XI.	Target analyte identification	N	
XII.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	JW-SC-030-0-1-20240722	24G0502-02	Sediment	07/22/24
2	JW-SC-030-1-2-20240722	24G0502-03	Sediment	07/22/24
3	JW-SC-031-0-1-20240722	24G0502-05	Sediment	07/22/24
4	JW-SC-031-1-2-20240722	24G0502-06	Sediment	07/22/24
5	JW-RB-20240722 RB	24G0502-08	Water	07/22/24
6	JW-SC-030-0-1-20240722MS	24G0502-02MS	Sediment	07/22/24
7	JW-SC-030-1-2-20240722MS	24G0502-03MS	Sediment	07/22/24
8	JW-SC-030-1-2-20240722MSD	24G0502-03MSD	Sediment	07/22/24
9	JW-SC-030-0-1-20240722MSD	24G0502-02MSD	Sediment	07/22/24
10	JW-RB-20240722MS	24G0502-08MS	Water	07/22/24
11	JW-RB-20240722MSD	24G0502-08MSD	Water	07/22/24
12				
13				

Notes:

1	BMG0702						
2	BM G0595						

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG. Chlordane
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH. Chlordane (Technical)
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II. Aroclor 1262
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ. Aroclor 1268
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. 2,4'-DDD	KK. Oxychlordane
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. 2,4'-DDE	LL. trans-Nonachlor
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE. 2,4'-DDT	MM. cis-Nonachlor
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF. Hexachlorobenzene	NN.

Notes:_____

LDC #: 59625E3b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: FT

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
What type of continuing calibration calculation was performed? ___%D or ___%R
Y N N/A Were continuing calibration standards analyzed at the required frequencies?
Y N N/A Did the continuing calibration standards meet the %D / %R validation criteria of ≤20.0% / 80-120%?
Level IV Only
Y N N/A Were the retention times for all calibrated analytes within their respective acceptance windows?

(5)

#	Date	Standard ID	Detector/ Column	Compound	%D (Limit ≤ 20.0)	RT (limit)	Associated Samples	Qualifications
1	8/2/24	SMH0057-	col 1	Z	44.3		all water	J/UA qual Z (ND)
		CCV1	2	↓	33.6		↓	↓

LDC #: 59625 E3b

VALIDATION FINDINGS WORKSHEET
Internal Standards

Reviewer: KM

METHOD: GC PCBs (EPA SW 846 Method 8082)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". (19)

Y (N) N/A Were all internal standard area counts within -50 to +100 of the associated calibration standard?

Y (N) N/A Were the retention times of the internal standards within +/- 30 seconds of the retention times of the associated calibration standard?

#	Sample ID	Internal Standard	Column	Area (Limits)	RT (Limits)	Qualifications
	5	*	col 1	902035 (1030926 - 4122104)		J+/UJ/P all ND
						qual AA, BB
						Aroclor 1262
						Aroclor 1268
	* Hexabromobiphenyl					

BNB = 1-Bromo-2-nitrobenzene
HBB = Hexabromobiphenyl

LDC #: 59625E3b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: FT

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?

[✓ Y] N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

(8)

#	MS/MSD ID	Compound	MS %Recovery	MSD %Recovery	MS/MSD %Recovery Limits	RPD (Limits)	Associated Samples	Qualifications
	10 +11	BB		53.3	(60-140)	( )	5	J/UJ/A ND
						( )		
						( )		
						( )		
						( )		
						( )		
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LDC #: 59625E3b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: FT

METHOD: [✓ GC] ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y [✓ N] N/A Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?

Level IV/D Only

Y N [✓ N/A] Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

(10)

LCS/LCSD ID	Compound	LCS % Recovery	LCSD % Recovery	LCS/LCSD %Recovery limits	RPD (Limits)	Associated Samples	Qualifications
BMG0595-	Y	58.0		60-140	( )	all water	J/UJ/P all ND
LCS					( )		qual V, W, X, Y
					( )		
					( )		
					( )		
					( )		
					( )		
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LDC #: 59625E3b

VALIDATION FINDINGS WORKSHEET
Target Analyte Quantitation

Reviewer: FT

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

(12)

#	Associated Samples	Compound Name	%RPD Bet 2 col ≤40 Findings	Qualifications
	1	Z	43.2	J dw /Δ
	2	ΔΔ	58.1	J dw /Δ

Comments: See sample calculation verification worksheet for recalculations

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Jeld-Wen

LDC Report Date: September 25, 2024

Parameters: Polychlorinated Dioxins/Dibenzofurans

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc., Tukwila, WA/
Pace Analytical Services, LLC, Minneapolis, MN

Sample Delivery Group (SDG): 24G0502/10702950

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JW-RB-20240722	24G0502-08/10702950001	Water	07/22/24

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Step 1 Pre-Remedial Design Investigation Quality Assurance Project Plan – Marine Areas of Jeld Wen Site (September 2023) and a modified outline of the USEPA National Functional Guidelines (NFG) for High Resolution Superfund Methods Data Review (November 2020). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Dioxins/Dibenzofurans by Environmental Protection Agency (EPA) Method 1613B

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The reported result was an estimated quantity value.

U (Non-detected): The analyte was analyzed for, but was not detected above the level of the adjusted detection limit or quantitation limit, as appropriate.

UJ (Non-detected): The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

NJ (Tentatively identified): The analyte has been "tentatively identified" or "presumptively identified" as present, and the associated numerical value was the estimated concentration in the sample.

R (Rejected): The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Peak Resolution
16 ICP Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards/Labeled Compounds (High Resolution)
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Estimated Maximum Possible Concentration
24 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25%.

The static resolving power was at least 10,000 (10% valley definition).

III. Initial Calibration and Initial Calibration Verification

A five point initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all analytes and less than or equal to 35.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were within the QC limits for all analytes and labeled compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration results were within the QC limits for all analytes and labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Analyte	Concentration (pg/L)	Associated Samples
Blank-114254	08/14/24	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD 1,2,3,4,6,7,8-HpCDD Total HpCDD OCDD	0.87 2.4 1.5 2.6 5.6	All samples in SDG 24G0502/10702950

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration (pg/L)	Modified Final Concentration (pg/L)
JW-RB-20240722	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD 1,2,3,4,6,7,8-HpCDD Total HpCDD OCDD	0.62 2.2 2.3 2.2 7.5	0.62U 2.2U 2.3U 2.2J 7.5U

VI. Field Blanks

Sample JW-RB-20240722 was identified as a rinsate blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration (pg/L)	Associated Samples
JW-RB-20240722	07/22/24	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD Total HxCDD 1,2,3,4,6,7,8-HpCDD Total HpCDD OCDF OCDD	0.62 2.2 2.2 2.3 2.2 1.9 7.5	No associated samples in this SDG

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Labeled Compounds

All labeled compound percent recoveries (%R) and ion abundance ratios (IAR) were within QC limits.

XI. Target Analyte Quantitation

All target analyte quantitations met validation criteria with the following exceptions:

Sample	Analyte	Flag	A or P
All samples in SDG 24G0502/10702950	All analytes flagged "I" by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A

Raw data were not reviewed for Stage 2B validation.

XII. Target Analyte Identification

Raw data were not reviewed for Stage 2B validation.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Data qualified due to laboratory blank contamination and results reported by the laboratory as EMPCs, are summarized and presented in the Data Qualification Summary.

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Data Qualification Summary - SDG 24G0502/10702950

Sample	Analyte	Flag	A or P	Reason (Code)
JW-RB-20240722	All analytes flagged "I" by the laboratory as estimated maximum possible concentration (EMPC).	J (all detects)	A	Target analyte quantitation (EMPC) (23)

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG 24G0502/10702950

Sample	Analyte	Modified Final Concentration (pg/L)	Code
JW-RB-20240722	1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD 1,2,3,4,6,7,8-HpCDD Total HpCDD OCDD	0.62U 2.2U 2.3U 2.2J 7.5U	7

Jeld-Wen
Polychlorinated Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG 24G0502/10702950

No Sample Data Qualified in this SDG

LDC #: 59625E21 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/10/24

SDG #: 24G0502/10702950 Stage 2B Page: 1 of 1

Laboratory: Analytical Resources, Inc., Tukwila, WA Reviewer: EJ

Sub-Laboratory: Pace Analytical Services, LLC, Minneapolis, MN 2nd Reviewer: AE

METHOD: HRGC/HRMS Polychlorinated Dioxins/Dibenzofurans (EPA Method 1613B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	%RSD ≤ 20/35 ICV = QC limits
IV.	Continuing calibration	A	CCV = QC limits
V.	Laboratory Blanks	SW	
VI.	Field blanks	SW	RB = 1
VII.	Matrix spike/Matrix spike duplicates	N	CS
VIII.	Laboratory control samples	A	LCS ID
IX.	Field duplicates	N	
X.	Labeled Compounds	A	
XI.	Target analyte quantitation	SW	
XII.	Target analyte identification	N	
XIII.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank

	Client ID	Lab ID	Matrix	Date
1	JW-RB-20240722 RB 10702950001	24G0502-08	Water	07/22/24
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans

A. 2,3,7,8-TCDD	F. 1,2,3,4,6,7,8-HpCDD	K. 1,2,3,4,7,8-HxCDF	P. 1,2,3,4,7,8,9-HpCDF	U. Total HpCDD
B. 1,2,3,7,8-PeCDD	G. OCDD	L. 1,2,3,6,7,8-HxCDF	Q. OCDF	V. Total TCDF
C. 1,2,3,4,7,8-HxCDD	H. 2,3,7,8-TCDF	M. 2,3,4,6,7,8-HxCDF	R. Total TCDD	W. Total PeCDF
D. 1,2,3,6,7,8-HxCDD	I. 1,2,3,7,8-PeCDF	N. 1,2,3,7,8,9-HxCDF	S. Total PeCDD	X. Total HxCDF
E. 1,2,3,7,8,9-HxCDD	J. 2,3,4,7,8-PeCDF	O. 1,2,3,4,6,7,8-HpCDF	T. Total HxCDD	Y. Total HpCDF

Notes:_____

LDC #: 49604c21

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: F7

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method ~~8290A~~) F7 1613B

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a method blank? (7)
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
Y N N/A Was the method blank contaminated?

Blank extraction date: 8/14/24 **Blank analysis date:** 8/17/24 **Associated samples:** All

Conc. units: pg/L

Compound	Blank ID	Sample Identification								
	MB1		1							
N	0.87		0.62U							
C	2.4		2.2U							
F	1.5		2.3U							
H	2.6		2.2 J							
G	5.6		7.5U							

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 59625E21

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: F7

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Y N N/A Were field blanks identified in this SDG?

Y N N/A Were target compounds detected in the field blanks?

Blank units: pg/L **Associated sample units:** NA

Sampling date: 7/22/24

Field blank type: (circle one) Field Blank / Rinsate / Other: RB Associated Samples: none

Compound	Blank ID	Sample Identification								
	1									
N	0.62									
C	1.2									
T	1.2									
F	2.3									
H	2.2									
Q	1.9									
G	7.5									

Blank units: _____ **Associated sample units:** _____

Sampling date: _____

Field blank type: (circle one) Field Blank / Rinsate / Other: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

LDC #: 59604C1

VALIDATION FINDINGS WORKSHEET
Target Analyte Quantitation and Reported CRQLs

Reviewer: FT

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290A)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N (N/A) Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the compound?
Y N (N/A) Compound quantitation and CRQLs were adjusted to reflect all sample dilutions and dry weight factors (if necessary).

(23)

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		All	all analytes qualified as EMPC	I	J dw/Δ

Comments: See sample calculation verification worksheet for recalculations