High-Resolution Gas Chromatography/High-Resolution Mass Spectrometry
PCCDs/PCDFs (EPA Method 1613B)
Stage 2A Review
Data Quality Control (QC)

Site: PHSS-Swan Island Basin	SDG #: 21635
Laboratory: CFA	Project #: DT2002.03.03.04.01
HydroGeoLogic, Inc. Validator: John Tracy	Validation Date: 09.12.23
HGL Peer Reviewer: Ken Rapuano	Peer Review Date: 9.15.23

Client Sample ID	Laboratory Sample ID	Matrix
SIB-091-TOB-1-2-10102022	21635001	Riverbank Soil
SIB-091-TOB-2-3-10102022	21635002	Riverbank Soil
SIB-090-OHW-1-2-10102022	21635003	Riverbank Soil
SIB-090-TOB-1-2-10102022	21635004	Riverbank Soil
SIB-093-TOB-1-2-10072022	21635005	Riverbank Soil
SIB-093-TOB-2-3-10072022	21635006	Riverbank Soil
SIB-092-MLW-1-2-10102022	21635007	Riverbank Soil
SIB-092-TOB-1-2-10102022	21635008	Riverbank Soil
SIB-095-TOB-2-3-10072022	21635009	Riverbank Soil
SIB-094-TOB-1-2-10072022	21635010	Riverbank Soil
SIB-094-TOB-2-3-10072022	21635011	Riverbank Soil
SIB-093-OHW-1-2-10072022	21635012	Riverbank Soil
SIB-093-OHW-2-3-10072022	21635013	Riverbank Soil
SIB-097-OHW-1-2-10072022	21635014	Riverbank Soil
SIB-097-TOB-1-2-10072022	21635015	Riverbank Soil
SIB-096-OHW-1-2-10072022	21635016	Riverbank Soil
SIB-095-TOB-1-2-10072022	21635017	Riverbank Soil
SIB-098-OHW-1-2-10072022	21635018	Riverbank Soil
SIB-098-OHW-2-3-10072022	21635019	Riverbank Soil
SIB-098-TOB-1-2-10072022	21635020	Riverbank Soil

The following Stage 2A review was performed on the requested analyses. No results were rejected, and analytical completeness is 100%.

Narrative and Completeness Review – The case narrative and data package were checked for completeness. No completeness issues were noted.

Qualification: None required.

Sample Delivery and Condition – All samples arrived intact at the laboratory in acceptable condition and temperature and were properly preserved. No other discrepancies were noted.

Qualification: None required.

Holding Times – All samples were prepared and analyzed within their required holding times.

Qualification: None required.

Method Blanks – The method 1613B method bank was contaminated with target analytes including the following:

- 1,2,3,4,6,7,8-HpCDD at 0.396 pg/g, leading to a qualification limit of 1.98 pg/g
- 1,2,3,4,6,7,8,9-OCDD at 0.978 pg/g, leading to a qualification limit of 4.89 pg/g
- 2,3,7,8-TCDF at 0.208 pg/g, leading to a qualification limit of 1.04 pg/g
- 1,2,3,7,8-PeCDF at 0.156 pg/g, leading to a qualification limit of 0.78 pg/g
- 1,2,3,4,7,8-HxCDF at 0.182 pg/g, leading to a qualification limit of 0.91 pg/g
- 1,2,3,6,7,8-HxCDF at 0.104 pg/g, leading to a qualification limit of 0.52 pg/g
- 2,3,4,6,7,8-HxCDF at 0.11 pg/g, leading to a qualification limit of 0.55 pg/g
- 1,2,3,4,6,7,8-HpCDF at 0.684 pg/g, leading to a qualification limit of 3.42 pg/g
- 1,2,3,4,6,7,8,9-OCDF at 0.398 pg/g, leading to a qualification limit of 1.99 pg/g

Detections in associated samples less than or equal to the qualification limits should be qualified U-MBL.

Qualification: **The following results were qualified U-MBL; the detect_flag for the affected results is changed from Y to N.**

- **The 2,3,7,8-TCDF results in samples SIB-092-MLW-1-2-10102022 and SIB-098-TOB-1-2-10072022**
- **The 1,2,3,7,8-PeCDF result in sample SIB-092-MLW-1-2-10102022**
- **The 1,2,3,4,7,8-HxCDF results in samples SIB-092-MLW-1-2-10102022 and SIB-098-OHW-2-3-10072022**
- **The 1,2,3,6,7,8-HxCDF result in sample SIB-098-OHW-2-3-10072022**
- **The 1,2,3,4,6,7,8-HpCDF result in sample SIB-098-OHW-2-3-10072022**

Rinsate Blanks – Rinse blank EB01-10052022 (results reported in SDG 20574) is associated with all samples in this SDG with a sample date of 10/07/2022 and was free from contamination.

Rinse blank EB02-10102022 (results reported in SDG 20574) is associated with all riverbank soil samples reported in this SDG with a sample date of 10/10/2022. Due to the differences in mass extracted, the concentrations reported as pg/L in EBs correspond to the 0.1 x concentration in pg/g in soil samples. OCDD was detected in the rinse blank, but the detected concentration was similar to the concentration in the associated aqueous method blank. The OCDD detected in the rinse blank is attributable to laboratory contamination in aqueous sample preparation and no qualification of solid matrix samples is required.

Qualification: None required.

Laboratory Control Sample (LCS) and Laboratory Control Sample Duplicate (LCSD) – LCS/LCSD %Rs and RPDs were within QAPP control limits.

Qualification: None required.

Surrogates – All surrogates (labeled standards) were within control limits.

Qualification: None required.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) – An MS/MSD was performed using sample SIB-091-TOB-1-2-10102022. All %Rs were within QAPP control limits in the MS/MSD with the exception of 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8,9-OCDD. For 1,2,3,4,6,7,8,9-OCDD, the sample concentration was >4x the spike concentration and the %R results are not applicable. The result for 1,2,3,4,6,7,8-HpCDD in the parent sample should be qualified J. All RPDs were within QAPP control limits.

Qualification: **The 1,2,3,4,6,7,8-HpCDD result in sample SIB-091-TOB-1-2-10102022 is qualified J, reason code MSH.**

Field Duplicate – No field duplicate was submitted with this SDG.

Qualification: None required.

Compound Quantitation – Analyte non-detections were reported as the EDL and qualified U. Analytes detected between the EDL and PQL were reported as J-qualified results by the laboratory. These J qualifiers were retained unless superseded by a more severe qualifier.

If a detected analyte has an ion ration outside the characteristic ion ratio window, the result is reported as an estimated maximum potential concentration. All results reported as an EMPC (a "K" flag is present in the laboratory qualifier) are qualified J-EMPC unless superseded by a higher priority qualifier.

2,3,7,8-TCDF is not fully resolved on the DB-5MS column; when detected above the PQL on the DB-5MS column, the result was confirmed on a DB-225 column using the instrument ID listed in the case narrative. In cases where two results are reported for 2,3,7,8-TCDF for a sample, the result from the DB-225 column is selected for use and the result from the DB-5MS is qualified DNR-EXC.

In cases where a target analyte is detected at a concentration above the calibrated range, the laboratory's practice is to report the result with a laboratory qualifier of E without running a dilution so long as the detector is not saturated. The OCDD results for 2 affected samples are qualified J-ACR.

Qualification: **The following results are qualified:**

- **All results reported with a laboratory qualifier of K are qualified J with reason code EMPC.**
- **All 2,3,7,8-TCDF results reported from the DB-5MS column that are paired with a 2,3,7,8-TCDF result from the DB-225 column are qualified DNR, reason code EXC; note that the reportable_result field for these results are populated with "Yes" by the laboratory and are changed to "No" for the affected results.**
- **Two OCDD results reported with a laboratory qualifier of E are qualified J with reason code ACR; note that the reportable_result field for these results are populated with "No" by the laboratory and are changed to "Yes" for the affected results.**

Qualification Summary Table (results in pg/g):

Sample	Analyte	Lab Value	Lab Qualifier	Validated Value	Validated Qualifier	Reason Code
SIB-091-TOB-1-2-10102022	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	258	--	258	J	MSH
SIB-091-TOB-1-2-10102022	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	4.19	JK	4.19	J	EMPC
SIB-091-TOB-1-2-10102022	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	1.67	JK	1.67	J	EMPC
SIB-091-TOB-1-2-10102022	2,3,7,8-TETRACHLORODIBENZOFURAN	3.32	K	3.32	DNR	EXC
SIB-091-TOB-1-2-10102022	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	0.639	K	0.639	J	EMPC
SIB-091-TOB-2-3-10102022	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	1.05	JK	1.05	J	EMPC
SIB-091-TOB-2-3-10102022	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	1.95	JK	1.95	J	EMPC
SIB-091-TOB-2-3-10102022	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	1.94	JK	1.94	J	EMPC
SIB-091-TOB-2-3-10102022	1,2,3,7,8-PENTACHLORODIBENZOFURAN	2.29	JK	2.29	J	EMPC
SIB-091-TOB-2-3-10102022	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	1.14	JK	1.14	J	EMPC
SIB-091-TOB-2-3-10102022	2,3,4,7,8-PENTACHLORODIBENZOFURAN	2.08	JK	2.08	J	EMPC
SIB-091-TOB-2-3-10102022	2,3,7,8-TETRACHLORODIBENZOFURAN	1.6	BK	1.6	DNR	EXC
SIB-091-TOB-2-3-10102022	2,3,7,8-TETRACHLORODIBENZOFURAN	1.4	BK	1.4	J	EMPC
SIB-091-TOB-2-3-10102022	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1.72	K	1.72	J	EMPC
SIB-090-OHW-1-2-10102022	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	8.22	K	8.22	J	EMPC
SIB-090-OHW-1-2-10102022	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	3.44	K	3.44	J	EMPC
SIB-090-OHW-1-2-10102022	2,3,7,8-TETRACHLORODIBENZOFURAN	4.29	K	4.29	DNR	EXC
SIB-090-OHW-1-2-10102022	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	1.1	K	1.1	J	EMPC
SIB-090-TOB-1-2-10102022	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	0.962	JK	0.962	J	EMPC
SIB-090-TOB-1-2-10102022	2,3,7,8-TETRACHLORODIBENZOFURAN	2.24	--	2.24	DNR	EXC
SIB-093-TOB-1-2-10072022	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	1.61	JK	1.61	J	EMPC
SIB-093-TOB-1-2-10072022	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	3.73	JK	3.73	J	EMPC
SIB-093-TOB-1-2-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	2.23	--	2.23	DNR	EXC
SIB-093-TOB-2-3-10072022	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	2.58	JK	2.58	J	EMPC
SIB-093-TOB-2-3-10072022	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	1.4	JK	1.4	J	EMPC
SIB-093-TOB-2-3-10072022	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	1.91	JK	1.91	J	EMPC
SIB-093-TOB-2-3-10072022	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	3.42	JK	3.42	J	EMPC
SIB-093-TOB-2-3-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	2.56	--	2.56	DNR	EXC

Sample	Analyte	Lab Value	Lab Qualifier	Validated Value	Validated Qualifier	Reason Code
SIB-093-TOB-2-3-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	1.23	BK	1.23	J	EMPC
SIB-092-MLW-1-2-10102022	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	0.543	JK	0.543	J	EMPC
SIB-092-MLW-1-2-10102022	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.751	BJK	0.751	UJ	MBL,EMPC
SIB-092-MLW-1-2-10102022	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.86	JK	0.86	J	EMPC
SIB-092-MLW-1-2-10102022	1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.327	BJ	0.327	U	MBL
SIB-092-MLW-1-2-10102022	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	0.277	JK	0.277	J	EMPC
SIB-092-MLW-1-2-10102022	2,3,7,8-TETRACHLORODIBENZOFURAN	0.645	BJ	0.645	U	MBL
SIB-092-TOB-1-2-10102022	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	1.78	JK	1.78	J	EMPC
SIB-092-TOB-1-2-10102022	2,3,7,8-TETRACHLORODIBENZOFURAN	4.5	K	4.5	DNR	EXC
SIB-095-TOB-2-3-10072022	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	2.13	JK	2.13	J	EMPC
SIB-095-TOB-2-3-10072022	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	1.24	JK	1.24	J	EMPC
SIB-095-TOB-2-3-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	1.11	BK	1.11	J	EMPC
SIB-095-TOB-2-3-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	1.1	BK	1.1	DNR	EXC
SIB-094-TOB-1-2-10072022	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	1.44	JK	1.44	J	EMPC
SIB-094-TOB-1-2-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	2.45	--	2.45	DNR	EXC
SIB-094-TOB-1-2-10072022	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	0.617	K	0.617	J	EMPC
SIB-094-TOB-2-3-10072022	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	3.05	JK	3.05	J	EMPC
SIB-094-TOB-2-3-10072022	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	2.91	JK	2.91	J	EMPC
SIB-094-TOB-2-3-10072022	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	1.37	JK	1.37	J	EMPC
SIB-094-TOB-2-3-10072022	2,3,4,7,8-PENTACHLORODIBENZOFURAN	4.76	JK	4.76	J	EMPC
SIB-094-TOB-2-3-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	1.17	BK	1.17	DNR	EXC
SIB-093-OHW-1-2-10072022	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	1.97	JK	1.97	J	EMPC
SIB-093-OHW-1-2-10072022	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	6.21	K	6.21	J	EMPC
SIB-093-OHW-1-2-10072022	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	1.81	JK	1.81	J	EMPC
SIB-093-OHW-1-2-10072022	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	7.57	K	7.57	J	EMPC
SIB-093-OHW-1-2-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	2.8	K	2.8	DNR	EXC
SIB-093-OHW-2-3-10072022	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	6.78	K	6.78	J	EMPC
SIB-093-OHW-2-3-10072022	2,3,4,7,8-PENTACHLORODIBENZOFURAN	10.7	K	10.7	J	EMPC
SIB-093-OHW-2-3-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	2.75	K	2.75	DNR	EXC
SIB-097-OHW-1-2-10072022	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	209	K	209	J	EMPC

Sample	Analyte	Lab Value	Lab Qualifier	Validated Value	Validated Qualifier	Reason Code
SIB-097-OHW-1-2-10072022	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	2.62	JK	2.62	J	EMPC
SIB-097-OHW-1-2-10072022	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	5	K	5	J	EMPC
SIB-097-OHW-1-2-10072022	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	1.99	JK	1.99	J	EMPC
SIB-097-OHW-1-2-10072022	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	3.01	JK	3.01	J	EMPC
SIB-097-OHW-1-2-10072022	2,3,4,7,8-PENTACHLORODIBENZOFURAN	2.45	JK	2.45	J	EMPC
SIB-097-OHW-1-2-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	1.4	B	1.4	DNR	EXC
SIB-097-TOB-1-2-10072022	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	15.6	K	15.6	J	EMPC
SIB-097-TOB-1-2-10072022	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	4.31	JK	4.31	J	EMPC
SIB-097-TOB-1-2-10072022	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	4.11	JK	4.11	J	EMPC
SIB-097-TOB-1-2-10072022	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	2.96	JK	2.96	J	EMPC
SIB-097-TOB-1-2-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	2.87	K	2.87	DNR	EXC
SIB-097-TOB-1-2-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	2.45	K	2.45	J	EMPC
SIB-097-TOB-1-2-10072022	OCTACHLORODIBENZO-P-DIOXIN	6010	E	6010	J	ACR
SIB-096-OHW-1-2-10072022	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	3.04	JK	3.04	J	EMPC
SIB-096-OHW-1-2-10072022	2,3,4,7,8-PENTACHLORODIBENZOFURAN	5.8	K	5.8	J	EMPC
SIB-096-OHW-1-2-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	2.16	K	2.16	DNR	EXC
SIB-096-OHW-1-2-10072022	OCTACHLORODIBENZO-P-DIOXIN	5910	E	5910	J	ACR
SIB-095-TOB-1-2-10072022	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	3.36	JK	3.36	J	EMPC
SIB-095-TOB-1-2-10072022	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	1.04	JK	1.04	J	EMPC
SIB-095-TOB-1-2-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	2.55	K	2.55	DNR	EXC
SIB-098-OHW-1-2-10072022	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	0.993	JK	0.993	J	EMPC
SIB-098-OHW-1-2-10072022	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	0.771	JK	0.771	J	EMPC
SIB-098-OHW-1-2-10072022	1,2,3,7,8-PENTACHLORODIBENZOFURAN	1.16	BJK	1.16	J	EMPC
SIB-098-OHW-2-3-10072022	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	3.05	BJK	3.05	UJ	MBL,EMPC
SIB-098-OHW-2-3-10072022	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.843	BJK	0.843	UJ	MBL,EMPC
SIB-098-OHW-2-3-10072022	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	0.468	BJK	0.468	UJ	MBL,EMPC
SIB-098-OHW-2-3-10072022	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	0.656	BJK	0.656	J	EMPC
SIB-098-OHW-2-3-10072022	2,3,4,7,8-PENTACHLORODIBENZOFURAN	1.14	JK	1.14	J	EMPC
SIB-098-OHW-2-3-10072022	OCTACHLORODIBENZOFURAN	6.76	JK	6.76	J	EMPC
SIB-098-TOB-1-2-10072022	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	1.4	JK	1.4	J	EMPC
SIB-098-TOB-1-2-10072022	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.628	JK	0.628	J	EMPC

Sample	Analyte	Lab Value	Lab Qualifier	Validated Value	Validated Qualifier	Reason Code
SIB-098-TOB-1-2-10072022	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	1.85	JK	1.85	J	EMPC
SIB-098-TOB-1-2-10072022	2,3,4,7,8-PENTACHLORODIBENZOFURAN	1.94	JK	1.94	J	EMPC
SIB-098-TOB-1-2-10072022	2,3,7,8-TETRACHLORODIBENZOFURAN	0.91	BJK	0.91	UJ	MBL,EMPC