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 #: 20602
Laboratory: CFA	Project #: DT2002.03.03.04.01
HydroGeoLogic, Inc. Validator: John Tracy	Validation Date: 07.21.23
HGL Peer Reviewer: Ken Rapuano	Peer Review Date: 8.3.23

Client Sample ID	Laboratory Sample ID	Matrix
SIB-086-MLW-0-1-10112022	20602001	Riverbank Soil
SIB-086-OHW-0-1-10112022	20602002	Riverbank Soil
SIB-086-TOB-0-1-10112022	20602003	Riverbank Soil
SIB-085-MLW-0-1-10112022	20602004	Riverbank Soil
SIB-085-OHW-0-1-10112022	20602005	Riverbank Soil
SIB-085-TOB-0-1-10112022	20602006	Riverbank Soil
SIB-085-TOB-0-1-10112022 MS	20602007	Riverbank Soil
SIB-085-TOB-0-1-10112022 MSD	20602008	Riverbank Soil
FD05-10112022	20602009	Riverbank Soil
SIB-084-MLW-0-1-10112022	20602010	Riverbank Soil
SIB-084-OHW-0-1-10112022	20602011	Riverbank Soil
SIB-084-TOB-0-1-10112022	20602012	Riverbank Soil
SIB-083-MLW-0-1-10112022	20602013	Riverbank Soil
SIB-083-OHW-0-1-10112022	20602014	Riverbank Soil
SIB-083-TOB-0-1-10112022	20602015	Riverbank Soil
SIB-082-MLW-0-1-10112022	20602016	Riverbank Soil
SIB-082-OHW-0-1-10112022	20602017	Riverbank Soil
SIB-082-TOB-0-1-10112022	20602018	Riverbank Soil
SIB-081-MLW-0-1-10122022	20602019	Riverbank Soil
SIB-081-OHW-0-1-10122022	20602020	Riverbank Soil
SIB-081-TOB-0-1-10122022	20602021	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 – With the exception of several labeling discrepancies, which were resolved, 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 blank was contaminated with 0.764 pg/g of 1,2,3,4,6,7,8,9-OCDD, 0.160 pg/g of 1,2,3,7,8-PeCDF, 0.374 pg/g of 1,2,3,4,6,7,8-HpCDF, and 0.402 pg/g of 1,2,3,4,6,7,8,9-OCDF, leading to qualification limits of 3.82 pg/g (19.1 pg/g for 5x dilutions), 0.8 pg/g (4 pg/g for 5x dilutions), 1.87 pg/g (9.35 pg/g for 5x dilutions)and 2.01 pg/g (10.05 pg/g for 5x dilutions), respectively. All detections below qualification limits should be qualified U-MBL.

> ***Qualification:*** **The 1,2,3,7,8-PeCDF result in sample SIB-086-MLW-0-1-10112022 is qualified U-MBL. The 1,2,3,4,6,7,8-HpCDF results in samples SIB-085-MLW-0-1-10112022, FD05-10112022, SIB-084-MLW-0-1-10112022, SIB-082-MLW-0-1-10112022, and SIB-081-MLW-0-1-10122022 are qualified U-MBL. The 1,2,3,4,6,7,8,9-OCDF results in samples SIB-085-MLW-0-1-10112022 and SIB-084-MLW-0-1-10112022 are qualified U-MBL.**

Rinsate Blanks – Rinse blank EB02-10102022 (results reported in SDG 20574) is associated with all samples in this SDG and was free from contamination with the exception of 1,2,3,4,6,7,8,9-OCDD; however, the result in this EB was not substantially different from that reported in the method blank associated with this EB. The OCDD result reported for EB06-08/04/2022 represents contamination associated with aqueous sample preparation and is not related to cross-contamination in the field. No additional qualification is required.

> *Qualification:* None required.

Laboratory Control Sample (LCS) and Laboratory Control Sample Duplicate (LCSD) – All LCS/LCSD %Rs and RSDs 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-085-TOB-0-1-10112022. All %Rs were within QAPP control limits, with a few exceptions. 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8,9-OCDD recovered outside control limits in the MS and/or MSD. The sample concentration was >4x the spike concentration and the %R results are not applicable. All RPDs were within control limits with the exception of 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8,9-OCDD. In the parent sample, these results should be qualified J-MSP.

> ***Qualification:*** **The 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8,9-OCDD results in sample SIB-085-TOB-0-1-10112022 are qualified J-MSP.**

Field Duplicate – Sample FD05-10112022 was submitted as a field duplicate of sample SIB-085-MLW-0-1-10112022. All precision criteria were met.

Parent sample SIB-081-OHW-0-1-10122022 was analyzed with this SDG, while its field duplicate, FD06-10122022 was analyzed with SDG 20603. All precision criteria were met.

> *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 6 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.**
- **6 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-086-MLW-0-1-10112022	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.604	JK	0.604	J	EMPC
SIB-086-MLW-0-1-10112022	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	0.456	JK	0.456	J	EMPC
SIB-086-MLW-0-1-10112022	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	1.24	JK	1.24	J	EMPC
SIB-086-MLW-0-1-10112022	1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.352	BJ	0.352	U	MBL
SIB-086-MLW-0-1-10112022	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	0.578	JK	0.578	J	EMPC
SIB-086-MLW-0-1-10112022	2,3,4,7,8-PENTACHLORODIBENZOFURAN	0.649	JK	0.649	J	EMPC
SIB-086-MLW-0-1-10112022	2,3,7,8-TETRACHLORODIBENZOFURAN	0.424	JK	0.424	J	EMPC
SIB-086-OHW-0-1-10112022	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	4.8	JK	4.8	J	EMPC
SIB-086-OHW-0-1-10112022	2,3,7,8-TETRACHLORODIBENZOFURAN	2.43	--	2.43	DNR	EXC
SIB-086-OHW-0-1-10112022	OCTACHLORODIBENZO-P-DIOXIN	4550	E	4550	J	ACR
SIB-086-TOB-0-1-10112022	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	3.06	JK	3.06	J	EMPC
SIB-086-TOB-0-1-10112022	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	2.85	K	2.85	J	EMPC
SIB-086-TOB-0-1-10112022	2,3,7,8-TETRACHLORODIBENZOFURAN	3.35	--	3.35	DNR	EXC
SIB-085-MLW-0-1-10112022	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	0.57	BJ	0.57	U	MBL
SIB-085-MLW-0-1-10112022	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	0.319	JK	0.319	J	EMPC
SIB-085-MLW-0-1-10112022	2,3,7,8-TETRACHLORODIBENZOFURAN	0.251	JK	0.251	J	EMPC
SIB-085-MLW-0-1-10112022	OCTACHLORODIBENZOFURAN	1.37	BJ	1.37	U	MBL
SIB-085-OHW-0-1-10112022	2,3,7,8-TETRACHLORODIBENZOFURAN	3.27	--	3.27	DNR	EXC
SIB-085-OHW-0-1-10112022	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	0.39	JK	0.39	J	EMPC
SIB-085-OHW-0-1-10112022	OCTACHLORODIBENZO-P-DIOXIN	7510	E	7510	J	ACR
SIB-085-TOB-0-1-10112022	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	772	--	772	J	MSP
SIB-085-TOB-0-1-10112022	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	5.57	K	5.57	J	EMPC
SIB-085-TOB-0-1-10112022	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	3.14	K	3.14	J	EMPC
SIB-085-TOB-0-1-10112022	2,3,7,8-TETRACHLORODIBENZOFURAN	3.13	--	3.13	DNR	EXC
SIB-085-TOB-0-1-10112022	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	0.567	K	0.567	J	EMPC

Sample	Analyte	Lab Value	Lab Qualifier	Validated Value	Validated Qualifier	Reason Code
SIB-085-TOB-0-1-10112022	OCTACHLORODIBENZO-P-DIOXIN	11500	E	11500	J	MSP,ACR
FD05-10112022	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	0.412	BJK	0.412	UJ	MBL,EMPC
FD05-10112022	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	3.4	JK	3.4	J	EMPC
SIB-084-MLW-0-1-10112022	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	0.923	BJ	0.923	U	MBL
SIB-084-MLW-0-1-10112022	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	0.318	JK	0.318	J	EMPC
SIB-084-MLW-0-1-10112022	OCTACHLORODIBENZOFURAN	1.41	BJ	1.41	U	MBL
SIB-084-OHW-0-1-10112022	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	3.05	JK	3.05	J	EMPC
SIB-084-OHW-0-1-10112022	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	3.84	JK	3.84	J	EMPC
SIB-084-OHW-0-1-10112022	2,3,7,8-TETRACHLORODIBENZOFURAN	1.21	K	1.21	DNR	EXC
SIB-084-TOB-0-1-10112022	2,3,4,7,8-PENTACHLORODIBENZOFURAN	1.49	JK	1.49	J	EMPC
SIB-084-TOB-0-1-10112022	2,3,7,8-TETRACHLORODIBENZOFURAN	1.39	K	1.39	DNR	EXC
SIB-084-TOB-0-1-10112022	2,3,7,8-TETRACHLORODIBENZOFURAN	2.31	K	2.31	J	EMPC
SIB-083-OHW-0-1-10112022	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	6.22	K	6.22	J	EMPC
SIB-083-OHW-0-1-10112022	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	2.66	JK	2.66	J	EMPC
SIB-083-OHW-0-1-10112022	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	3.71	JK	3.71	J	EMPC
SIB-083-OHW-0-1-10112022	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	9.56	K	9.56	J	EMPC
SIB-083-OHW-0-1-10112022	2,3,7,8-TETRACHLORODIBENZOFURAN	1.48	--	1.48	DNR	EXC
SIB-083-OHW-0-1-10112022	2,3,7,8-TETRACHLORODIBENZOFURAN	2.26	K	2.26	J	EMPC
SIB-083-TOB-0-1-10112022	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	3.43	JK	3.43	J	EMPC
SIB-083-TOB-0-1-10112022	2,3,7,8-TETRACHLORODIBENZOFURAN	1.79	--	1.79	DNR	EXC
SIB-083-TOB-0-1-10112022	2,3,7,8-TETRACHLORODIBENZOFURAN	2	K	2	J	EMPC
SIB-082-MLW-0-1-10112022	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	0.646	BJ	0.646	U	MBL
SIB-082-OHW-0-1-10112022	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	33.4	K	33.4	J	EMPC
SIB-082-OHW-0-1-10112022	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	115	K	115	J	EMPC
SIB-082-OHW-0-1-10112022	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	38.7	K	38.7	J	EMPC
SIB-082-OHW-0-1-10112022	2,3,7,8-TETRACHLORODIBENZOFURAN	33.7	--	33.7	DNR	EXC

Sample	Analyte	Lab Value	Lab Qualifier	Validated Value	Validated Qualifier	Reason Code
SIB-082-OHW-0-1-10112022	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	3.33	K	3.33	J	EMPC
SIB-082-OHW-0-1-10112022	OCTACHLORODIBENZO-P-DIOXIN	29700	E	29700	J	ACR
SIB-082-TOB-0-1-10112022	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	13.6	K	13.6	J	EMPC
SIB-082-TOB-0-1-10112022	1,2,3,7,8-PENTACHLORODIBENZOFURAN	6.19	K	6.19	J	EMPC
SIB-082-TOB-0-1-10112022	2,3,4,7,8-PENTACHLORODIBENZOFURAN	7.43	K	7.43	J	EMPC
SIB-082-TOB-0-1-10112022	2,3,7,8-TETRACHLORODIBENZOFURAN	3.02	--	3.02	DNR	EXC
SIB-082-TOB-0-1-10112022	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	0.89	K	0.89	J	EMPC
SIB-082-TOB-0-1-10112022	OCTACHLORODIBENZO-P-DIOXIN	6830	E	6830	J	ACR
SIB-081-MLW-0-1-10122022	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	1.55	BJ	1.55	U	MBL
SIB-081-MLW-0-1-10122022	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	9.47	K	9.47	J	EMPC
SIB-081-OHW-0-1-10122022	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	7.7	K	7.7	J	EMPC
SIB-081-OHW-0-1-10122022	1,2,3,7,8-PENTACHLORODIBENZOFURAN	1.79	JK	1.79	J	EMPC
SIB-081-OHW-0-1-10122022	2,3,7,8-TETRACHLORODIBENZOFURAN	1.03	K	1.03	DNR	EXC
SIB-081-OHW-0-1-10122022	2,3,7,8-TETRACHLORODIBENZOFURAN	1.08	K	1.08	J	EMPC
SIB-081-TOB-0-1-10122022	2,3,7,8-TETRACHLORODIBENZOFURAN	2.54	--	2.54	DNR	EXC
SIB-081-TOB-0-1-10122022	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	0.858	K	0.858	J	EMPC
SIB-081-TOB-0-1-10122022	OCTACHLORODIBENZO-P-DIOXIN	6470	E	6470	J	ACR