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 #: 20664
Laboratory: CFA	Project #: DT2002.03.03.04.01
HydroGeoLogic, Inc. Validator: John Tracy	Validation Date: 07.28.23
HGL Peer Reviewer: Ken Rapuano	Peer Review Date: 8.4.23

Client Sample ID	Laboratory Sample ID	Matrix
SIB-053-MLW-0-1-10202022	20664001	Riverbank Soil
SIB-053-MLW-0-1-10202022 MS	20664002	Riverbank Soil
SIB-053-MLW-0-1-10202022 MSD	20664003	Riverbank Soil
SIB-053-OHW-0-1-10202022	20664004	Riverbank Soil
SIB-053-TOB-0-1-10202022	20664005	Riverbank Soil
SIB-052-OHW-0-1-10202022	20664006	Riverbank Soil
SIB-052-TOB-0-1-10202022	20664007	Riverbank Soil
SIB-051-OHW-0-1-10202022	20664008	Riverbank Soil
SIB-051-TOB-0-1-10202022	20664009	Riverbank Soil
SIB-050-OHW-0-1-10202022	20664010	Riverbank Soil
SIB-050-TOB-0-1-10202022	20664011	Riverbank Soil
SIB-049-OHW-0-1-10202022	20664012	Riverbank Soil
SIB-049-TOB-0-1-10202022	20664013	Riverbank Soil
FD12-10202022	20664014	Riverbank Soil
SIB-048-TOB-0-1-10242022	20664015	Riverbank Soil
SIB-048-OHW-0-1-10242022	20664016	Riverbank Soil
SIB-048-MLW-0-1-10242022	20664017	Riverbank Soil
SIB-047-TOB-0-1-10242022	20664018	Riverbank Soil
SIB-047-OHW-0-1-10242022	20664019	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 free from contamination with the following exceptions. All detections below qualification limits should be qualified U-MBL. See table below.

Analyte	Result (pg/g)	Qualification Limit (pg/g)
1,2,3,7,8-PeCDD	0.258	1.29
1,2,3,7,8,9-HxCDD	0.308	1.54
1,2,3,4,6,7,8-HpCDD	0.37	1.85
1,2,3,4,6,7,8,9-OCDD	1.51	7.55
1,2,3,7,8-PeCDF	0.246	1.23
2,3,4,7,8-PeCDF	0.24	1.2
1,2,3,6,7,8-HxCDF	0.212	1.06
2,3,4,6,7,8-HxCDF	0.25	1.25
1,2,3,4,6,7,8-HpCDF	0.456	2.28
1,2,3,4,7,8,9-HpCDF	0.354	1.77
1,2,3,4,6,7,8,9-OCDF	0.99	4.95

Qualification: **The 1,2,3,7,8-PeCDD results in samples SIB-050-OHW-0-1-10202022, SIB-049-OHW-0-1-10202022, and FD12-10202022 are qualified U-MBL. The 1,2,3,7,8,9-HxCDD result in sample FD12-10202022 is qualified U-MBL. The 1,2,3,7,8-PeCDF result in sample FD12-10202022 is qualified U-MBL.**

Rinsate Blanks – Rinse blank EB03-10192022 (results reported in SDG 20699) is associated with all samples in this SDG with a sample date of 10/20/22 and was free from contamination with the exception of 1,2,3,4,6,7,8,9-OCDD, which was detected at 4.08 pg/L leading to a qualification limit of 2.04 pg/g. All detections are above the qualification limit and no qualification is required. Rinse blank EB04-10262022 (results reported in SDG 20699) is associated with all samples in this SDG with a sample date of 10/24/22 and was free from contamination with the exception of 1,2,3,4,6,7,8,9-OCDD, which was detected at 3.95 pg/L leading to a qualification limit of 1.975 pg/g. All detections are above the qualification limit and no 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-053-MLW-0-1-10202022. All %Rs were within QAPP control limits, with the exception of 1,2,3,4,6,7,8-HpCDD, 1,2,3,4,6,7,8,9-OCDD, and 1,2,3,4,6,7,8-HpCDF. which recovered below control limits in the MS and/or MSD. For 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8,9-OCDD, the sample concentration was >4x the spike concentration and the %R results are not applicable. For 1,2,3,4,6,7,8-HpCDF, this result should be qualified J-MSL in the parent sample. 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 and these results should be qualified J-MSP in the parent sample.

Qualification: **The 1,2,3,4,6,7,8-HpCDF result in sample SIB-053-MLW-0-1-10202022 is qualified J-MSL. The 1,2,3,4,6,7,8-HpCDD and 1,2,3,4,6,7,8,9-OCDD results in sample SIB-053-MLW-0-1-10202022 are qualified J-MSP.**

Field Duplicate –Sample FD12-10202022 was submitted as a field duplicate of sample SIB-049-OHW-0-1-10202022. All precision criteria were met the following exceptions: 1,2,3,4,6,7,8-HpCDD, 1,2,3,4,6,7,8,9-OCDD, and 1,2,3,4,6,7,8-HpCDF failed RPD criteria and should be qualified J-FDPR, while 1,2,3,4,7,8-HxCDF, 1,2,3,4,7,8,9-HpCDF, and 1,2,3,4,6,7,8,9-OCDF failed absolute difference criteria and should be qualified J-FDPA.

> ***Qualification:*** **In samples FD12-10202022 and SIB-049-OHW-0-1-10202022, the 1,2,3,4,6,7,8-HpCDD, 1,2,3,4,6,7,8,9-OCDD, and 1,2,3,4,6,7,8-HpCDF results are qualified J-FDPR and the 1,2,3,4,7,8-HxCDF, 1,2,3,4,7,8,9-HpCDF, and 1,2,3,4,6,7,8,9-OCDF results are qualified J-FDPA.**

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.**
> - **Two Heptachloro-p-dioxin results reported with a laboratory qualifier of E have the reportable_result field populated with "No" by the laboratory and are changed to "Yes". Although total congener results are not validated, these results are reportable.**

Qualification Summary Table (results in pg/g):

Sample	Analyte	Lab Value	Lab Qualifier	Validated Value	Validated Qualifier	Reason Code
SIB-053-MLW-0-1-10202022	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	73.6	--	73.6	J	MSL
SIB-053-MLW-0-1-10202022	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	466	--	466	J	MSP
SIB-053-MLW-0-1-10202022	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	2.81	K	2.81	J	EMPC
SIB-053-MLW-0-1-10202022	2,3,4,7,8-PENTACHLORODIBENZOFURAN	9.84	K	9.84	J	EMPC
SIB-053-MLW-0-1-10202022	2,3,7,8-TETRACHLORODIBENZOFURAN	2.66	K	2.66	DNR	EXC
SIB-053-MLW-0-1-10202022	OCTACHLORODIBENZO-P-DIOXIN	3430	--	3430	J	MSP
SIB-053-OHW-0-1-10202022	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	1.76	BJK	1.76	J	EMPC
SIB-053-OHW-0-1-10202022	2,3,7,8-TETRACHLORODIBENZOFURAN	1.57	--	1.57	DNR	EXC
SIB-053-OHW-0-1-10202022	2,3,7,8-TETRACHLORODIBENZOFURAN	1.8	K	1.8	J	EMPC
SIB-053-TOB-0-1-10202022	2,3,7,8-TETRACHLORODIBENZOFURAN	6.72	--	6.72	DNR	EXC
SIB-053-TOB-0-1-10202022	OCTACHLORODIBENZO-P-DIOXIN	7440	E	7440	J	ACR
SIB-052-OHW-0-1-10202022	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	1.97	BJK	1.97	J	EMPC
SIB-052-OHW-0-1-10202022	2,3,7,8-TETRACHLORODIBENZOFURAN	2.01	--	2.01	DNR	EXC
SIB-052-TOB-0-1-10202022	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	14.8	JK	14.8	J	EMPC
SIB-052-TOB-0-1-10202022	2,3,4,7,8-PENTACHLORODIBENZOFURAN	16	JK	16	J	EMPC
SIB-052-TOB-0-1-10202022	2,3,7,8-TETRACHLORODIBENZOFURAN	3.14	JK	3.14	J	EMPC
SIB-052-TOB-0-1-10202022	OCTACHLORODIBENZO-P-DIOXIN	42300	E	42300	J	ACR
SIB-051-OHW-0-1-10202022	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	3.06	K	3.06	J	EMPC
SIB-051-OHW-0-1-10202022	2,3,7,8-TETRACHLORODIBENZOFURAN	2.39	--	2.39	DNR	EXC
SIB-051-OHW-0-1-10202022	OCTACHLORODIBENZO-P-DIOXIN	11300	E	11300	J	ACR
SIB-051-TOB-0-1-10202022	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	1.77	BJK	1.77	J	EMPC
SIB-051-TOB-0-1-10202022	2,3,7,8-TETRACHLORODIBENZOFURAN	0.965	JK	0.965	J	EMPC
SIB-050-OHW-0-1-10202022	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	1.42	BJK	1.42	J	EMPC
SIB-050-OHW-0-1-10202022	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	1.2	BJ	1.2	U	MBL
SIB-050-OHW-0-1-10202022	2,3,7,8-TETRACHLORODIBENZOFURAN	1.04	--	1.04	DNR	EXC
SIB-050-TOB-0-1-10202022	2,3,4,7,8-PENTACHLORODIBENZOFURAN	4.47	JK	4.47	J	EMPC
SIB-050-TOB-0-1-10202022	2,3,7,8-TETRACHLORODIBENZOFURAN	3.04	--	3.04	DNR	EXC
SIB-050-TOB-0-1-10202022	OCTACHLORODIBENZO-P-DIOXIN	5320	E	5320	J	ACR
SIB-049-OHW-0-1-10202022	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	178	--	178	J	FDPR

Sample	Analyte	Lab Value	Lab Qualifier	Validated Value	Validated Qualifier	Reason Code
SIB-049-OHW-0-1-10202022	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	294	--	294	J	FDPR
SIB-049-OHW-0-1-10202022	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	18.7	--	18.7	J	FDPA
SIB-049-OHW-0-1-10202022	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	51.1	--	51.1	J	FDPA
SIB-049-OHW-0-1-10202022	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	1.63	JK	1.63	J	EMPC
SIB-049-OHW-0-1-10202022	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	0.975	BJ	0.975	U	MBL
SIB-049-OHW-0-1-10202022	2,3,7,8-TETRACHLORODIBENZOFURAN	0.909	JK	0.909	J	EMPC
SIB-049-OHW-0-1-10202022	OCTACHLORODIBENZOFURAN	155	--	155	J	FDPA
SIB-049-OHW-0-1-10202022	OCTACHLORODIBENZO-P-DIOXIN	2930	--	2930	J	FDPR
SIB-049-TOB-0-1-10202022	2,3,7,8-TETRACHLORODIBENZOFURAN	5.25	--	5.25	DNR	EXC
FD12-10202022	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	36.8	--	36.8	J	FDPR
FD12-10202022	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	50.2	--	50.2	J	FDPR
FD12-10202022	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	3.51	BJ	3.51	J	FDPA
FD12-10202022	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	8.66	--	8.66	J	FDPA
FD12-10202022	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	0.46	BJ	0.46	U	MBL
FD12-10202022	1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.63	BJ	0.63	U	MBL
FD12-10202022	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	0.254	BJK	0.254	UJ	MBL,EMPC
FD12-10202022	OCTACHLORODIBENZOFURAN	30.9	--	30.9	J	FDPA
FD12-10202022	OCTACHLORODIBENZO-P-DIOXIN	579	--	579	J	FDPR
SIB-048-TOB-0-1-10242022	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	2.68	K	2.68	J	EMPC
SIB-048-TOB-0-1-10242022	2,3,7,8-TETRACHLORODIBENZOFURAN	1.35	K	1.35	J	EMPC
SIB-048-OHW-0-1-10242022	2,3,7,8-TETRACHLORODIBENZOFURAN	2.25	--	2.25	DNR	EXC
SIB-048-OHW-0-1-10242022	OCTACHLORODIBENZO-P-DIOXIN	6020	E	6020	J	ACR
SIB-048-MLW-0-1-10242022	2,3,4,7,8-PENTACHLORODIBENZOFURAN	8.74	K	8.74	J	EMPC
SIB-048-MLW-0-1-10242022	2,3,7,8-TETRACHLORODIBENZOFURAN	1.61	--	1.61	DNR	EXC
SIB-048-MLW-0-1-10242022	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	0.648	K	0.648	J	EMPC
SIB-047-TOB-0-1-10242022	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	10.3	K	10.3	J	EMPC
SIB-047-TOB-0-1-10242022	2,3,7,8-TETRACHLORODIBENZOFURAN	4.23	--	4.23	DNR	EXC
SIB-047-TOB-0-1-10242022	OCTACHLORODIBENZO-P-DIOXIN	10300	E	10300	J	ACR
SIB-047-OHW-0-1-10242022	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	3.67	JK	3.67	J	EMPC

Sample	Analyte	Lab Value	Lab Qualifier	Validated Value	Validated Qualifier	Reason Code
SIB-047-OHW-0-1-10242022	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	4.02	K	4.02	J	EMPC