HGL Data Validation Review Report

Project Name/Number	PHSS-SIB PDI / DT2002
Data Validation Stage	4
Laboratory	ALS Environmental
SDG	K2212278
HGL Reviewer	Ken Rapuano 9/28/23
HGL Peer Review	Justin Hersh 9/29/2023

General issues: The HGL reviewer ensured that all results with an interpreted_qualifiers of U or UJ had the corresponding detect_flag field populated with N and that all rows had Y in the validated_yn field.

The DV report used the higher of the method blank or equipment blank results (on-column) to qualify associated results. Although HGL's internal protocol is to use all applicable reason codes, using the reason code only associated with the highest associated blank is consistent with the NFG and is acceptable for this project.

Although equipment blank results are not validated, the method blanks associated with the equipment blanks were contaminated with several target analytes.

- For EB03-10192022, these analytes included DRO, RRO, BEHP, and multiple PAHs. The concentrations of most contaminants found in the aqueous method blank associated with EB03-10192022 were similar to the corresponding concentration found in the equipment blank and in the judgment of the HGL reviewer, it is appropriate to consider the detected results in the equipment blank to be laboratory artifacts due to aqueous preparation rather than field cross-contamination artifacts. This affects bis(2-ethylhexyl)phthalate and all PAHs except 2-methylnaphthalene and naphthalene.

Any change to qualification or reason codes is discussed in the method-specific sections below.

<u>Diesel Range Organics (DRO) and Residual Range Organics (RRO):</u>

The DV report used the on-column concentration to determine when to apply qualification for equipment blank contamination. This is appropriate when the dilution factor is 1; however, when the sample is diluted, this has the effect of applying the dilution factor to the qualification limit due to the equipment blank. HGL considers the undiluted qualification limit to be an absolute limit of the potential contribution of cross-contamination during sampling and applying the dilution factor on a sample-specific basis artificially overestimates the potential impact of field sampling cross contamination. When determining whether qualification should be applied, the equipment blank on-column qualification limit should be divided by the dilution factor to appropriately separate field contamination from laboratory contamination as represented by the method blank. The TPH-RRO results reported for samples SIB-063-OHW-0-1-10182022, SIB-063-MLW-0-1-10182022, SIB-062-OHW-0-1-10182022, SIB-062-MLW-0-1-10182022, and SIB-060-MLW-0-1-10192022 are above the qualification limit associated with the equipment blank when the dilution adjustment is removed. The TPH-RRO result for sample SIB-063-MLW-0-1-10182022 is below the corresponding method blank qualification threshold and the reason code for this result is changed to MBL. The other four affected results are above the corresponding method blank qualification limit and the U qualifier and EBL reason code is removed and not replaced for these three results.

Sample	Analyte	Validated Result	Validated Qualifier	Modified Validated Qualifier	Modified Interpreted Qualifier	Modified Final Reason Code
SIB-063-OHW-0-1-10182022	RRO	610	U	--	J	--
SIB-063-MLW-0-1-10182022	RRO	250	U	U	U	MBL
SIB-062-OHW-0-1-10182022	RRO	1600	U	--	--	--
SIB-062-MLW-0-1-10182022	RRO	570	U	--	J	--
SIB-060-MLW-0-1-10192022	RRO	750	U	--	J	--

Tributyltin:

The DV report incorrectly indicated that the TBT results in field duplicate pair SIB-065-OHW-0-1-10182022 / FD10-10182022 did not meet the absolute difference criterion. The HGL reviewer removed the qualification and FDPA reason codes for these two results.

Sample	Analyte	Validated Result	Validated Qualifier	Modified Validated Qualifier	Modified Interpreted Qualifier	Modified Final Reason Code
SIB-065-OHW-0-1-10182022	Tributyltin	0.99	J	--	J	--
FD10-10182022	Tributyltin	0.43	UJ	--	U	--

Organochlorine Pesticides:

No issues noted.

bis(2-Ethylhexyl)phthalate; Polycyclic Aromatic Hydrocarbons (PAHs):

All 20 B2EHP results were qualified U due to contamination in the equipment blank; these results should have the U-qualifier and EBH reason code removed due to the equipment blank results being considered analytical artifacts (see General Issues). The soil method blank associated with these samples was contaminated; the B2EHP results for all 20 samples are below the dilution-adjusted method blank qualification limit and EBH is replaced with MBL as the reason code.

In multiple cases, PAH results were qualified U due to contamination in the equipment blank that was determined to be caused by laboratory aqueous preparation contamination rather than field cross-contamination (see General Issues). In all but six cases, the affected sample results are greater than the qualification limit established by the corresponding soil method blank and the U qualifier and EBL or EBH reason code are removed and not replaced. In the six cases where the sample result is below the qualification limit from the associated soil method blank, the reason EBH or EBL reason code is replaced with the MBL reason code.

The DV report did not note the absolute difference discrepancy for benzo(a)anthracene in duplicate pair SIB-066-OHW-0-1-10182022 / FD09-10182022; both benzo(a)anthracene results in this duplicate pair should be qualified J, reason code FDPA. The DV report noted absolute difference

discrepancies between several PAHs in both duplicate pairs that are not discrepancies. It appears that PAH duplicate evaluation may have switched the duplicates associated with the two parent samples.

Sample	Analyte	Validated Result	Validated Qualifier	Modified Validated Qualifier	Modified Interpreted Qualifier	Modified Final Reason Code
SIB-066-MLW-0-1-10182022	bis(2-Ethylhexyl)phthalate	10	UJ	UJ	UJ	MBL, LCSH
SIB-066-MLW-0-1-10182022	Benzo(a)anthracene	1.1	U	--	J	--
SIB-066-MLW-0-1-10182022	Benzo(b)fluoranthene	1	U	--	J	--
SIB-066-MLW-0-1-10182022	Benzo(g,h,i)perylene	1.3	U	U	U	MBL
SIB-066-MLW-0-1-10182022	Chrysene	0.83	U	--	J	--
SIB-066-MLW-0-1-10182022	Fluoranthene	2.4	U	--	J	--
SIB-066-MLW-0-1-10182022	Phenanthrene	2.8	U	--	J	--
SIB-066-MLW-0-1-10182022	Pyrene	2.8	U	U	U	MBL
SIB-066-OHW-0-1-10182022	bis(2-Ethylhexyl)phthalate	92	UJ	UJ	UJ	MBL, LCSH
SIB-066-OHW-0-1-10182022	Benzo(a)anthracene	55	--	J	J	FDPA
SIB-066-OHW-0-1-10182022	Benzo(g,h,i)perylene	29	J	--	--	--
SIB-066-OHW-0-1-10182022	Phenanthrene	10	U	--	--	--
SIB-066-TOB-0-1-10182022	bis(2-Ethylhexyl)phthalate	100	UJ	UJ	UJ	MBL, LCSH
SIB-066-TOB-0-1-10182022	Benzo(a)anthracene	2.9	U	--	J	--
SIB-066-TOB-0-1-10182022	Benzo(b)fluoranthene	5.5	U	--	--	--
SIB-066-TOB-0-1-10182022	Benzo(g,h,i)perylene	4.3	U	--	J	--
SIB-066-TOB-0-1-10182022	Chrysene	3.5	U	--	J	--
SIB-066-TOB-0-1-10182022	Fluoranthene	4.9	U	--	--	--
SIB-066-TOB-0-1-10182022	Phenanthrene	2.2	U	--	J	--
SIB-066-TOB-0-1-10182022	Pyrene	5.5	U	--	--	--
FD09-10182022	bis(2-Ethylhexyl)phthalate	110	UJ	UJ	UJ	MBL, LCSH
FD09-10182022	Benzo(a)anthracene	15	--	J	J	FDPA
FD09-10182022	Benzo(g,h,i)perylene	21	J	--	--	--
FD09-10182022	Fluoranthene	19	UJ	J	J	FDPA
FD09-10182022	Phenanthrene	7.6	U	--	--	--
FD09-10182022	Pyrene	20	UJ	J	J	FDPA
SIB-063-TOB-0-1-10182022	bis(2-Ethylhexyl)phthalate	120	UJ	UJ	UJ	MBL, LCSH
SIB-063-TOB-0-1-10182022	Phenanthrene	22	U	--	--	--
SIB-063-OHW-0-1-10182022	bis(2-Ethylhexyl)phthalate	240	UJ	UJ	UJ	MBL, LCSH
SIB-063-MLW-0-1-10182022	bis(2-Ethylhexyl)phthalate	260	UJ	UJ	UJ	MBL, LCSH

Sample	Analyte	Validated Result	Validated Qualifier	Modified Validated Qualifier	Modified Interpreted Qualifier	Modified Final Reason Code
SIB-065-MLW-0-1-10182022	bis(2-Ethylhexyl)phthalate	89	UJ	UJ	UJ	MBL, LCSH
SIB-065-MLW-0-1-10182022	Benzo(a)anthracene	11	U	--	--	--
SIB-065-MLW-0-1-10182022	Chrysene	15	U	--	--	--
SIB-065-MLW-0-1-10182022	Fluoranthene	22	U	--	--	--
SIB-065-MLW-0-1-10182022	Phenanthrene	8.7	U	--	--	--
SIB-065-MLW-0-1-10182022	Pyrene	20	U	--	--	--
SIB-065-OHW-0-1-10182022	bis(2-Ethylhexyl)phthalate	110	UJ	UJ	UJ	MBL, LCSH
SIB-065-OHW-0-1-10182022	Benzo(a)anthracene	4.8	UJ	--	J	--
SIB-065-OHW-0-1-10182022	Benzo(a)pyrene	9.6	J	--	--	--
SIB-065-OHW-0-1-10182022	Benzo(b)fluoranthene	9.1	UJ	--	--	--
SIB-065-OHW-0-1-10182022	Benzo(g,h,i)perylene	6.4	UJ	--	--	--
SIB-065-OHW-0-1-10182022	Benzo(k)fluoranthene	3.6	J	--	J	--
SIB-065-OHW-0-1-10182022	Chrysene	5.8	UJ	--	--	--
SIB-065-OHW-0-1-10182022	Fluoranthene	7.8	UJ	--	--	--
SIB-065-OHW-0-1-10182022	Indeno(1,2,3-cd)pyrene	7.2	J	--	--	--
SIB-065-OHW-0-1-10182022	Phenanthrene	4.5	U	--	J	--
SIB-065-OHW-0-1-10182022	Pyrene	8	UJ	--	--	--
SIB-065-TOB-0-1-10182022	bis(2-Ethylhexyl)phthalate	83	UJ	UJ	UJ	MBL, LCSH
SIB-065-TOB-0-1-10182022	Benzo(a)anthracene	2.2	U	U	U	MBL
SIB-065-TOB-0-1-10182022	Benzo(b)fluoranthene	4.7	U	--	J	--
SIB-065-TOB-0-1-10182022	Benzo(g,h,i)perylene	3	U	--	J	--
SIB-065-TOB-0-1-10182022	Chrysene	2.9	U	--	J	--
SIB-065-TOB-0-1-10182022	Fluoranthene	4.1	U	--	J	--
SIB-065-TOB-0-1-10182022	Phenanthrene	2.4	U	--	J	--
SIB-065-TOB-0-1-10182022	Pyrene	4.3	U	--	J	--
FD10-10182022	bis(2-Ethylhexyl)phthalate	92	UJ	UJ	UJ	MBL, LCSH
FD10-10182022	Benzo(a)anthracene	5.6	UJ	--	--	--
FD10-10182022	Benzo(a)pyrene	9.5	J	--	--	--
FD10-10182022	Benzo(b)fluoranthene	7	UJ	--	--	--
FD10-10182022	Benzo(g,h,i)perylene	4.5	UJ	--	J	--
FD10-10182022	Benzo(k)fluoranthene	3.2	J	--	J	--
FD10-10182022	Chrysene	5.7	UJ	--	--	--
FD10-10182022	Fluoranthene	11	UJ	--	--	--

Sample	Analyte	Validated Result	Validated Qualifier	Modified Validated Qualifier	Modified Interpreted Qualifier	Modified Final Reason Code
FD10-10182022	Indeno(1,2,3-cd)pyrene	5.3	J	--	--	--
FD10-10182022	Phenanthrene	5	U	--	J	--
FD10-10182022	Pyrene	12	UJ	--	--	--
SIB-064-MLW-0-1-10182022	bis(2-Ethylhexyl)phthalate	130	UJ	UJ	UJ	MBL, LCSH
SIB-064-MLW-0-1-10182022	Benzo(a)anthracene	12	U	--	--	--
SIB-064-MLW-0-1-10182022	Chrysene	19	U	--	--	--
SIB-064-MLW-0-1-10182022	Fluoranthene	30	U	--	--	--
SIB-064-MLW-0-1-10182022	Phenanthrene	12	U	--	--	--
SIB-064-MLW-0-1-10182022	Pyrene	31	U	--	--	--
SIB-064-OHW-0-1-10182022	bis(2-Ethylhexyl)phthalate	56	UJ	UJ	UJ	MBL, SSH, LCSH
SIB-064-OHW-0-1-10182022	Benzo(a)anthracene	1	U	U	U	MBL
SIB-064-OHW-0-1-10182022	Benzo(b)fluoranthene	1.3	U	--	J	--
SIB-064-OHW-0-1-10182022	Benzo(g,h,i)perylene	0.91	U	U	U	MBL
SIB-064-OHW-0-1-10182022	Chrysene	0.83	U	--	J	--
SIB-064-OHW-0-1-10182022	Fluoranthene	1.6	U	--	J	--
SIB-064-OHW-0-1-10182022	Phenanthrene	1.6	U	--	J	--
SIB-064-OHW-0-1-10182022	Pyrene	1.6	U	U	U	MBL
SIB-064-TOB-0-1-10182022	bis(2-Ethylhexyl)phthalate	60	UJ	UJ	UJ	MBL, SSH, LCSH
SIB-064-TOB-0-1-10182022	Fluoranthene	38	U	--	--	--
SIB-064-TOB-0-1-10182022	Phenanthrene	22	U	--	--	--
SIB-062-TOB-0-1-10182022	bis(2-Ethylhexyl)phthalate	65	UJ	UJ	UJ	MBL, LCSH
SIB-062-TOB-0-1-10182022	Benzo(a)anthracene	7.3	U	--	--	--
SIB-062-TOB-0-1-10182022	Chrysene	10	U	--	--	--
SIB-062-TOB-0-1-10182022	Fluoranthene	14	U	--	--	--
SIB-062-TOB-0-1-10182022	Phenanthrene	6.8	U	--	--	--
SIB-062-TOB-0-1-10182022	Pyrene	15	U	--	--	--
SIB-062-OHW-0-1-10182022	bis(2-Ethylhexyl)phthalate	430	UJ	UJ	UJ	MBL, SSH, LCSH
SIB-062-MLW-0-1-10182022	bis(2-Ethylhexyl)phthalate	69	UJ	UJ	UJ	MBL, LCSH
SIB-062-MLW-0-1-10182022	Benzo(a)anthracene	10	U	--	--	--
SIB-062-MLW-0-1-10182022	Chrysene	22	U	--	--	--
SIB-062-MLW-0-1-10182022	Fluoranthene	35	U	--	--	--
SIB-062-MLW-0-1-10182022	Phenanthrene	9.3	U	--	--	--
SIB-062-MLW-0-1-10182022	Pyrene	49	U	--	--	--

Sample	Analyte	Validated Result	Validated Qualifier	Modified Validated Qualifier	Modified Interpreted Qualifier	Modified Final Reason Code
SIB-061-MLW-0-1-10192022	bis(2-Ethylhexyl)phthalate	240	UJ	UJ	UJ	MBL, SSH, LCSH
SIB-061-OHW-0-1-10192022	bis(2-Ethylhexyl)phthalate	65	UJ	UJ	UJ	MBL, LCSH
SIB-061-OHW-0-1-10192022	Benzo(a)anthracene	5.4	U	--	--	--
SIB-061-OHW-0-1-10192022	Benzo(g,h,i)perylene	6.3	U	--	--	--
SIB-061-OHW-0-1-10192022	Chrysene	11	U	--	--	--
SIB-061-OHW-0-1-10192022	Fluoranthene	17	U	--	--	--
SIB-061-OHW-0-1-10192022	Phenanthrene	19	U	--	--	--
SIB-061-OHW-0-1-10192022	Pyrene	13	U	--	--	--
SIB-060-MLW-0-1-10192022	bis(2-Ethylhexyl)phthalate	110	UJ	UJ	UJ	MBL, LCSH

Total Organic Carbon (TOC):

The DV report noted discrepancies between the TOC results in both duplicate pairs; however, both pairs were in control. It appears that the validator switched the parent sample/duplicate associations. The HGL reviewer removed the J-FDPA from the TOC results for samples SIB-066-OHW-0-1-10182022, FD09-10182022, SIB-065-OHW-0-1-10182022, and FD10-10182022.

The DV report indicated that all analyses were performed within the holding time. The holding time for soil samples listed in the QAPP is incorrect. The HGL reviewer confirmed that all samples were analyzed within the correct holding time of 28 days.

Sample	Analyte	Validated Result	Validated Qualifier	Modified Validated Qualifier	Modified Interpreted Qualifier	Modified Final Reason Code
SIB-066-OHW-0-1-10182022	TOC	0.62	J	--	--	--
FD09-10182022	TOC	0.55	J	--	--	--
SIB-065-OHW-0-1-10182022	TOC	0.08	--(1)	--	J	--
FD10-10182022	TOC	0.08	--(1)	--	J	--

(1) Left blank by validator in error.